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Evaluation of emergency department performance in Iraqi hospitals: Challenges and opportunities to improve care quality in Baghdad, the South, and the North

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Abstract
Background: The emergency department (ED) is a prime gateway to urgent acute treatment, which is a key component of Iraq's healthcare system for the past two decades since the US led invasion. Emergency department (ED) performance is challenged as hospitals are understaffed, poorly equipped, and need to compete for care delivery within the hospitals; improved ED performance is inextricably linked to the overall performance of hospitals in Iraq, where necessary care may not be available.
Objective: Evaluating the existing state of ED performance in three regions in Iraq (Baghdad, Southern Provinces and Northern Provinces) and identifying barriers and opportunities for improving quality of care either within the EDs or as a repository of acute care.
Methods: An observational, cross-sectional design was conducted with a sample of 24 hospitals in Iraq from January 2024 to June 2024. Performance metrics were based on the components of waiting times, patient satisfaction, clinical outcomes, resource utilization, and staff capacity or adequacy. Data were collected using patient surveys, medical chart reviews, and structured interviews with care providers.
Results: Evidence of regional differences with ED performance were identified across hospitals. Hospitals in Baghdad have more resources available for patient care but have a larger patient volume. Hospitals in the South showed longer waiting times for care delivery, longer times to see an ED specialist (which was not always available) and were faced with a challenging care delivery system. Northern hospitals demonstrated mixed ED performance based on the majority of performance metrics.
Conclusion: Iraqi emergency departments face serious systemic challenges influenced by problems linked to environmental conditions. There are several possible avenues for the EM to consider, including but not limited to, development of infrastructure, education and training of staff, optimising allocation of resources, and establishing operational and clinical protocols.

Keywords: Emergency department, Iraq, healthcare quality, performance evaluation, patient care

Introduction
Emergency departments are key to providing timely acute medical care in modern health systems, serving as the main connection between the community and the hospital based medical services. In Iraq, the landscape for emergency health care has changed dramatically in the last twenty years under diverse socio-political issues, economic restrictions, and health needs of the populations [1]. At one time, the Iraqi health system was one of the most sophisticated health systems in the Middle East; however, over the last two decades, Iraq has faced a number of challenges that have impacted emergency medical services, supply chains, and delivery of care [2].

The historical narrative of the Iraq health system affords some important context to the current performance of emergency departments. Prior to 1990, Iraq was a well-established public health care system with hospitals that were well equipped, established medical education, and had access to primary care [3]. However, a mix of political, economic and environmental issues—as a result of war, international sanctions, and conflict—allowed for a health system that is currently characterized by scarcity resource and decay of the primary structures to provide health care, as well as sustained issues in the healthcare workforce that impact the delivery and access to emergency care [4].

Modern Iraqi emergency departments now function in a context that includes regional variability, resource availability, and the changing demands of the patients. Iraq has three major geographical regions that contain Baghdad as the capital and centric location, the Southern provinces that are rich in oil wealth and socio-political issues that are different from northern areas, and northern regions that have considerations for administration and logistics; these regions contain different patterns of emergency care delivery [5]. In addition to regional variability, the population density, economic stability, security conditions, and available infrastructure to respond to diverse health care needs varies widely across the country. The importance of evaluating the performance of emergency departments goes beyond measuring any necessary patient care to include ramifications for public health, sustainability of the healthcare system, and the health of society at large. Emergency departments are a provider of acute care in many ways, but are also a safety net for populations without access to primary healthcare services [6]. In Iraq, as the primary healthcare system is underdeveloped in most areas, the emergency department operates as an adjunct for primary care, often treating a number of non-urgent cases, which are more appropriate for out-patient care [7].

One area of development has been the measurement of performance of emergency medicine and emergency departments. The implementation of performance metrics has, in the last three decades, moved more towards evidence-based metrics to measure performance in emergency medicine. Performance metrics have evolved over time from simply measuring waiting times and through-put to now include significant measures of efficiency and quality of care, such as patient satisfaction, clinical outcomes, cost-effectiveness, and staff satisfaction [8]. The Institute for Healthcare Improvement encourages systems to measure and evaluate the full range of the activities of emergency departments, while being cognizant of the context in which they operate and resource allocation accounting for equity issues within public health [9].

In developing healthcare systems like those in Iraq, when measuring and evaluating performance, one should consider certain challenges, including:

- Lack of technology in charity hospitals;
- Discipline, education, training, and experience of staff is not consistent and varies widely;
- Supply chain issues, stocking medical equipment and essential medications takes time and planning sometimes occurs inconsistently; and
- Patients with variable and unique backgrounds that are often complex and socioeconomically disadvantaged [10].

The WHO emphasizes the significance of establishing performance indicators that are culture specific and culturally relevant, and ultimately lead to quality improvements of care in developing health systems, like many of the developing or transitional countries with limited resources [11]. Considering the financial aspect of performance in emergency departments is of utmost concern in Iraq, as this country has a dependency on government financing of care, out of pocket payments and reliance on foreign aid. Emergency department performance efficiency can impact the sustainability of the health system and availability and access for patients [12]. At a minimum, studies in other middle income countries, have shown that working to enhance emergency department performance can provide economic benefit, including reduced hospitalization rates, improved health outcomes, and sustainability of the health system [13].

Related to the concept of emergency department performance, is the aspect of patient safety; it is important to consider the urgent, unpredictable, high-acuity context of emergency medical care brings to establishing potential risks identified that are relevant to quality assurance, which plays a role in risk management practices [14]. In the context of Iraq, where health care providers often work in poor conditions with limited resources, having implemented effective patient safety strategies is essential to quality of care, and helps to protect the safety of both the patient and provider [15].

The workforce aspect of emergency department performance is reflective of a general documented human resources issue in health care in Iraq. The emigration of physicians with experience, lack of access to continuing medical education, and work conditions have combined to overload many emergency departments across the country [16]. In addition, it is widely documented in the literature that providing proper numbers of staff, staff training, and competence, are relationship variables that impact patient care and the quality of emergency care and potential outcomes. The use of technology represents opportunity for improvement of emergency department performance, as well as challenges in improving emergency department performance, in Iraq. While it is possible use advanced information systems and medical technology implementation to support efficiency and quality of care, implementation has considerable requirements in terms of cost, and ongoing operational (e.g.., infrastructure, training, and ongoing maintenance) requirements [18]. Additionally, standardizing performance and performance improvement strategies must consider the digital divide in urban and rural health facilities.

A number of quality improvement methods that were developed in high-resource health systems require careful considerations of adaptation to the health system in Iraq. Lean management, Six Sigma, and continuous quality improvement methods need to have modifications made to include local resource constraints, cultural considerations, and organizational capacity [19]. Effective quality improvement implementation in comparable health systems emphasizes the participation of frontline health care providers, local leadership, and sustainable change management process [20].

The regulatory environment around emergency care in Iraq is evolving. A number of policy initiatives led by the Ministry of Health are focused on developing national standards for emergency departments, staff credentialing, and quality assurance in emergency departments. The Ministry of Health has launched a number of policy initiatives to strengthen the delivery of emergency care, however some of these efforts have been inconsistent between regions and health facilities [21]. Understanding the regulatory environment and actual performance outcomes and are an important area of ongoing emergency department evaluation.

The principles of patient-centered care are increasingly seen as critical components of high-quality emergency service delivery. In an Iraqi context, characterized by patients

frequently having complex medical and social needs, the capacity of emergency departments to provide culturally safe, compassionate, and holistic care, is an important quality of service compared other aspects of emergency service delivery [22]. Literature suggests that patient-centered approaches can enhance patient satisfaction and clinical outcomes, and reduce healthcare utilization and associated costs [23].

The system integration of emergency departments into the larger healthcare delivery system is another critical consideration in assessing performance. Effective emergency care cannot occur without coordinated access to primary care providers, specialist services, diagnostic services, and post-acute care [24]. The fragmented nature of the health system in Iraq continues to impede access to these services, and the effectiveness of emergency departments as integrated delivery networks will impact their overall performance and patient outcomes.

This major performance evaluation study of emergency department performance in Iraq's three largest regions seeks to add to the draw on evidence to help develop policy, inform resource allocation decisions, and quality improvement resources. The study evaluates performance from multiple dimensions, including operational efficiency, clinical quality, patient satisfaction, and staff experience, we hope this study will support the continued work to enhance Iraq's emergency health system capacity, and improve patient outcomes for the members of the communities using these important health care facilities.

Methodology

This cross-sectional observational study was designed to assess emergency department performance across three geographic zones of Iraq: Baghdad (central), southern provinces (Basrah, Najaf, Karbala, and Dhi Qar) and northern provinces (Erbil, Sulaymaniyah, and Dohuk). The study was conducted from January 2024-June 2024 directing a six month study period which could account for seasonal differences in throughput and performance of the emergency departments evaluated. The approach for this research consisted of a mixed methods design which included quantitative performance metrics and qualitative descriptions of the healthcare delivery process. This design was selected to provide an overall picture of the emergency department in our case studies which included both measurable quantitative metrics and housing the context of healthcare delivery and practice. The study protocol was developed according to international standards of best practice for performance evaluation research in healthcare and then fitted to the specifics of the Iraqi healthcare system, and healthcare delivery.

During hospital selection, a stratified purposive sampling design was utilized to select hospitals that would be representative of healthcare in the three targeted regions, based on differences in hospital ownership type, hospital size, and patient populations. The study included a total of 24 hospitals with eight hospitals selected from the three regional clusters. Selection criteria for the hospitals included being an emergency department service that operates 24 hours per day, minimum 100 bed capacity, providing basic diagnostic services (both laboratory and imaging), and willingness to participate in the research study.

Hospitals in the Baghdad region included four public tertiary care, two private hospitals, and two specialized medical centers. There were a total of eight hospitals in the southern region, composed of five public hospitals and three private health facilities, across four targeted provinces. There were four public hospitals, two private hospitals, and two hospitals who were part of the Kurdistan Regional Government healthcare system in the northern region. The sample from Baghdad, southern and northern regions was used to reflect representations of the healthcare system of Iraq and regions with a level of representation of institutional type and governance.

Data collection employed multiple complementary methodologies to capture the full spectrum of emergency department performance indicators. Primary data sources included prospective patient tracking, electronic medical record review, healthcare provider surveys, patient satisfaction assessments, and structured facility evaluations. Secondary data were obtained from hospital administrative systems, government health databases, and international healthcare reporting mechanisms where available.

Patient tracking protocols were implemented to monitor individual patient journeys through the emergency department from arrival to disposition. Key metrics included arrival time, triage completion time, initial physician assessment time, diagnostic test completion times, treatment initiation time, and final disposition time. Patient acuity was classified using a standardized five-level triage system adapted from international emergency medicine protocols and validated for use in the Iraqi healthcare context.

Medical record reviews were conducted for a systematic sample of emergency department encounters to assess clinical quality indicators including diagnostic accuracy, treatment appropriateness, medication errors, adverse events, and adherence to clinical guidelines. A standardized data extraction form was developed and pilot-tested to ensure consistency across different sites and reviewers. Chart reviews were performed by trained clinical researchers with emergency medicine backgrounds to maintain quality and accuracy of data extraction.

Healthcare provider surveys were administered to emergency department physicians, nurses, and support staff across all participating facilities. The survey instrument included validated scales for measuring job satisfaction, workplace stress, professional development needs, and perceptions of care quality. Additional questions addressed facility-specific challenges, resource adequacy, training needs, and recommendations for performance improvement. Survey administration was conducted anonymously to encourage honest responses and minimize social desirability bias.

Patient satisfaction assessments utilized a modified version of the Emergency Department Patient Experience of Care survey, adapted for cultural appropriateness and linguistic accessibility in Arabic and Kurdish languages. Patients or their designated representatives were invited to participate in satisfaction surveys within 24-48 hours of emergency department discharge or admission. The survey covered domains including waiting times, communication with healthcare providers, pain management, discharge instructions, and overall satisfaction with care received.

Facility evaluations employed standardized assessment tools to document physical infrastructure, equipment availability, staffing levels, supply chain management, and quality assurance processes. These evaluations were conducted by trained researchers using structured checklists developed

specifically for emergency department assessment in resource-constrained environments. Infrastructure assessments included evaluation of space adequacy, patient flow design, privacy provisions, safety features, and accessibility accommodations.

Staffing assessments documented physician and nursing coverage patterns, staff-to-patient ratios during different shifts, availability of specialists for consultation, and support staff adequacy. Credentialing and training backgrounds of key personnel were reviewed to assess workforce qualifications and identify professional development needs. Workload distribution patterns were analyzed to identify potential bottlenecks and efficiency improvement opportunities.

Equipment and supply assessments evaluated availability and functionality of essential emergency department equipment including cardiac monitors, defibrillators, ventilators, diagnostic equipment, and emergency medications. Supply chain reliability was assessed through inventory tracking and provider interviews regarding stock-out frequencies and procurement challenges. Medical record systems and information technology infrastructure were evaluated for adequacy and integration capabilities.

Quality assurance processes were documented through review of existing protocols, incident reporting systems, peer review mechanisms, and continuous improvement initiatives. The presence and effectiveness of clinical guidelines, treatment protocols, and safety procedures were assessed through document review and staff interviews. Patient safety culture was evaluated using validated assessment tools adapted for the Iraqi healthcare context.

Data management procedures incorporated multiple quality control mechanisms to ensure data accuracy and completeness. Electronic data capture systems were utilized where possible, with manual data entry verified through double-entry validation processes. Range checks, consistency checks, and logical error detection algorithms were implemented to identify and correct data entry errors. Missing data patterns were analyzed to assess potential bias and inform analytical approaches.

Statistical analysis plans were developed to answer the study's primary and secondary outcomes, whilst accommodating the hierarchical nature of the data while accounting for clustering effects within hospitals and regions. Descriptive statistics were computed for all variables measured in the study and continuous variables had appropriate measures of central tendency and dispersion, while frequency distributions at the appropriate intervals were employed for categorical variables.

Statistical tests of comparative differences between regions were applied using appropriate tests whilst controlling for characteristics of distributions and sample size. Analysis of variance was employed to examine continuous variables meeting assumptions of normality, while non-parametric alternatives were employed when distribution of variables was skewed. Categorical variables were subjected to appropriate statistical tests such as chi-square tests and Fisher's exact tests.

Multivariable regression models were subsequently developed to assess the underlying drivers of performance outcomes allowing for potential confounding.

The ethical considerations of the research were recognized and followed for the complete research process with respect to international standards for human subjects research. Ethical approval was granted by the appropriate Iraqi healthcare authorities and institutions, and prior to data collection, ethical approval was also attained from participating facilities. Informed consent procedures were followed for all patient surveys and staff interview, and informed consent procedures were clearly articulated to staff to ensure volunteerism and participant confidentiality. Patient de-identification protocols were also followed to maintain confidentiality and security while allowing for the analysis to continue.

Results

The comprehensive evaluation of emergency department performance across 24 Iraqi hospitals revealed significant regional variations and systematic challenges affecting care delivery quality. Data collection yielded 15,847 patient encounters, 892 healthcare provider surveys, and detailed facility assessments across all participating sites during the six-month study period.

Table 1: Hospital Characteristics by Region

Characteristic	Baghdad (n=8)	South (n=8)	North (n=8)	Total (n=24)
Hospital Type				
Public	5 (62.5%)	6 (75.0%)	5 (62.5%)	16 (66.7%)
Private	3 (37.5%)	2 (25.0%)	3 (37.5%)	8 (33.3%)
Bed Capacity				
100-200 beds	2 (25.0%)	4 (50.0%)	3 (37.5%)	9 (37.5%)
201-400 beds	4 (50.0%)	3 (37.5%)	4 (50.0%)	11 (45.8%)
>400 beds	2 (25.0%)	1 (12.5%)	1 (12.5%)	4 (16.7%)
ED Annual Volume				
<10,000 visits	1 (12.5%)	3 (37.5%)	2 (25.0%)	6 (25.0%)
10,000-20,000 visits	3 (37.5%)	4 (50.0%)	5 (62.5%)	12 (50.0%)
>20,000 visits	4 (50.0%)	1 (12.5%)	1 (12.5%)	6 (25.0%)
24/7 Specialist Availability	6 (75.0%)	3 (37.5%)	4 (50.0%)	13 (54.2%)

Table 2: Emergency Department Performance Metrics by Region

Performance Indicator	Baghdad	South	North	p-value
Waiting Times (minutes, mean ± SD)				
Triage to physician assessment	45.2 ± 23.1	67.8 ± 31.4	52.3 ± 28.7	<0.001
Door to discharge (non-admitted)	147.5 ± 78.3	198.2 ± 94.6	165.4 ± 83.1	<0.001
Door to admission decision	234.7 ± 112.5	289.3 ± 128.7	256.8 ± 119.2	0.003
Patient Satisfaction Scores (1-5 scale)				
Overall satisfaction	3.7 ± 0.8	3.2 ± 0.9	3.5 ± 0.7	<0.001
Communication quality	3.8 ± 0.7	3.1 ± 0.8	3.4 ± 0.6	<0.001
Pain management	3.5 ± 0.9	2.9 ± 1.0	3.2 ± 0.8	<0.001
Staffing Ratios				
Patients per physician per shift	12.4 ± 4.2	18.7 ± 6.3	15.2 ± 5.1	<0.001

Patients per nurse per shift	8.9 ± 3.1	14.6 ± 4.8	11.3 ± 3.9	<0.001
Clinical Outcomes				
72-hour return rate (%)	8.3 ± 2.7	11.8 ± 3.9	9.7 ± 3.2	0.006
Medication error rate (%)	2.1 ± 0.8	3.4 ± 1.2	2.7 ± 1.0	0.002
Patient safety incidents per 1000 visits	4.2 ± 1.9	6.8 ± 2.7	5.1 ± 2.3	0.008

Table 3: Resource Availability and Infrastructure Assessment

Resource Category	Baghdad	South	North	Overall
Essential Equipment Availability (%)				
Cardiac monitors	95.6	78.2	87.3	87.0
Defibrillators	98.1	82.5	91.4	90.7
Mechanical ventilators	89.3	65.7	74.8	76.6
Point-of-care testing	76.4	43.9	58.2	59.5
Diagnostic Services (24/7 availability)				
Basic laboratory	87.5%	62.5%	75.0%	75.0%
Advanced laboratory	75.0%	37.5%	50.0%	54.2%
Plain radiography	100%	75.0%	87.5%	87.5%
CT scanning	75.0%	37.5%	62.5%	58.3%
Ultrasound	87.5%	62.5%	75.0%	75.0%
Medication Availability (%)				
Essential emergency drugs	92.4	81.7	86.9	87.0
Advanced cardiac drugs	84.6	69.3	77.8	77.2
Pain management options	88.2	74.5	81.1	81.3
Antibiotics	94.7	88.1	91.6	91.5

Table 4: Healthcare Provider Survey Results

Survey Domain	Baghdad (n=298)	South (n=294)	North (n=300)	p-value
Job Satisfaction (1-5 scale)	3.4 ± 0.7	2.9 ± 0.8	3.2 ± 0.6	<0.001
Workplace Stress Level (1-5 scale)	3.8 ± 0.6	4.2 ± 0.5	3.9 ± 0.7	<0.001
Training Adequacy (% adequate)	67.8%	45.2%	58.3%	<0.001
Resource Adequacy (% adequate)	59.4%	38.8%	48.7%	<0.001
Patient Load Appropriateness (% appropriate)	42.6%	28.9%	36.7%	<0.001
Quality of Care Delivered (1-5 scale)	3.5 ± 0.6	3.0 ± 0.7	3.3 ± 0.5	<0.001

The evaluation finds that performance differed widely across the regions. The hospitals in Baghdad performed more efficiently than those in the other two regions, despite having more patients. Hospitals in the southern region had consistently poor performance across many areas of evaluation, illustrated by the longest uait times, lowest levels on measures of patient satisfaction, and most amount of staff compared to the number of patients. Northern region hospitals had average or below average performance in most areas of evaluation. The findings illustrate the necessity for regionally focused interventions, while recognizing Aboriginal resources limitations all participants' experience. The statistically significant p-values in the majority of the comparisons indicate that regional differences were systematic and not random in terms of emergency department performance .

Discussion

These findings from the comprehensive evaluation of emergency department service delivery in Iraq's hospitals illustrate a complex health service delivery system that is characterized by significant regional variation, systemic resources shortages, and organizational capacity varied by site. The findings provide a great deal of insight regarding the current state of emergency services in Iraq and detail some of the necessary areas of intervention of a multi-level nature to support improvements to delivery of service to patients .

The significant differences in the evaluation findings, especially about the southern region hospitals of Iraq and the capital hospitals, represent not only the strengths and weaknesses of those hospitals. They are also represent a more complex reflection of the inequitable nature of resources across Iraq's social and geographic distribution. The emergency departments in Baghdad were consistently stronger across several constructs relative to southern hospitals that may stem from the disproportionate allocation of health service delivery resources to the capital city of Baghdad, its specialized personnel and access to technology not found in the rest of Iraq and often noted as a trend of many healthcare systems of developing countries where capital cities are targeted of development and investment in health [25]. Furthermore, the relative success of Baghdad hospitals versus southern hospitals should be appreciated in the context of the higher patient volumes, and more complex issues suggesting that better-resourced facilities are still struggling to meet demand for emergency departments.

Concerns regarding whether the performance gaps identified in the southern hospitals represent enduring problems to the delivery of emergency services need to be brought to the surface by health service administrators and policymakers. The longer wait times for patient assessments, lower patient satisfaction and higher rate of adverse events in care for southern region hospitals suggest issues with the system that cannot be simply attributed to a lack of resources. Despite their oil riches, the southern regions of Iraq have struggled with the challenges of using this wealth to establish functional healthcare systems [26]. This highlights that the allocations and governance systems for resources in Southern area healthcare will need significant changes to support any improvement in performance.

Staffing was a common issue in all regions, however, for southern hospitals, staffing shortages were described as more extreme. The ratios of patients to providers produced by this study far exceeded the normal limits for emergency department staffing ratios worldwide [27]. Staffing of course goes beyond availability, to patient safety, quality of service, and safety for the provider. Research has shown that there are strong associations in emergency care sectors between nursing staff and outcomes; and that the less staffed the department was, the more incidents of medical error, patient complaints, and adverse events that occurred [28].

The workforce challenges identified or suspected in this study point to more systemic problems with the health care human capital in Iraq. Continued emigration of experienced providers, stagnant professional development opportunities and poor working conditions are forming the basis of health care brain drain as it specifically relates to emergency medicine services [29]. The results of the survey, which discovered exceptionally high work stress and inadequate preparedness for training, reinforced the continued need for

workforce development approaches that will address not only the immediate staffing needs but also the ongoing professional development needs described in the previous chapter.

The variability of access to health care infrastructure and equipment between regions also demonstrated that Iraq's healthcare technology capacity had not been uniformly realized. Limited access to advanced diagnostic equipment, particularly in Southern hospitals, directly limits an emergency service's ability to provide timely and accurate diagnoses for more complex cases. The point-of-care testing capacities demonstrated to significantly reduce emergency department throughput time and facilitate improved clinical decision making, are still under-utilized at almost all study sites [30]. Investing in diagnostic infrastructure is a limited but robust opportunity for performance improvement that could yield tangible benefits in terms of quality of care and efficiency.

Patient satisfaction scores from each of the regions also revealed opportunities for improvement with respect to delivery of care and communication with patients. The low satisfaction scores recorded in the southern hospitals suggest that performance challenges extend beyond clinical outcomes, likely extending to aspects of the patient experience that can ultimately shape perceptions of quality of care. Evidence exists demonstrating unsatisfied patients often choose not to comply with treatment recommendations, or seek timely care, they will often have poorer health outcomes [31]. Improving patient satisfaction is simply an important target but it is also a means to achieve system improvements for the health care system as a whole.

The challenges consistently recorded at study sites for medication availability suggest that many of the supply chain vulnerabilities exist and would pose significant patient safety and quality care risks. Access to essential emergency medication on an unpredictable basis. This extends to more advance cardiac agents, and specialized medication for pain management, present direct challenges to emergency departments delivering evidence-based care to acute conditions. Optimizing the supply chain for medication represents a baseline condition for performance improvement of emergency departments that will require coordination between healthcare facilities, pharmaceutical distributors, and government purchasing agencies [32].

Quality and safety indicators found troubling distributions of preventable adverse events and medical errors in all regions. The medication error rate, and patient safety incident rate observed are substantially higher compared to benchmarks in high-performing healthcare organizations, demonstrating significant room for improvement through the application of systematic quality assurance and safety programs [33]. The development in the implementation of comprehensive patient safety programs, including incident reporting systems, root cause analysis processes, and continuous quality improvement mechanisms, are fundamental aspects of any strategy to improve emergency department performance.

Integration of the emergency department within the whole continuum of care was recognized as an important dimension that appeared to affect performance. Sites noted barriers accessing consultative services, dilemmas with patient transfers, and challenges between the emergency department and primary clinicians (for follow-up care). Barriers to integration increase the risk of poor outcomes for patients, increase emergency department crowding, and waste resources [34].

Care coordination barriers and challenges in referral networks were recognized as valuable opportunities for improvement at a systematic level.

The adoption of technology and the integration of health information systems also presented significant opportunities, but also challenges, which could dramatically improve emergency department performance in Iraq. The data showed that there was minimal utilization of electronic health records (EHRs), clinical decision support systems (CDSI)s, and performance monitoring technologies (in case of EHR usage). These observed challenges fit within a larger discourse on health technology adoption which has occurred in resource poor environments. With deliberate investments in appropriate health information technologies, Iraq could realize substantial improvements to care coordination, clinical decision making, and capacity for performance monitoring [35].

Issues related to the economic dimension of emergency department performance was particularly relevant in Iraq where governments finance healthcare systems and clinician out-of-pocket payments fund healthcare services. The economic feasibility of emergency service appears to affect both sustainability of healthcare systems, as well as patients, access to care. International best practice suggests investment in emergency department performance improvement can create a cost advantage in terms of reduced hospitalization, reduced medical errors, and more efficient use of resource [36].

Cultural and linguistic considerations are important, but often neglected, indicators of emergency department performance. Emergency departments in Iraq serve a large population that includes many ethnic and linguistic groups with varied healthcare requirements and expectations. Developing strategies for delivering culturally competent care, and developing multilanguage capabilities for communication represents potentially an ethical and quality of care opportunity for organizations in all study areas to improve patient satisfaction.

Training and professional development were identified as important predictors of provider satisfaction and perceived quality of care. Respondents' limited access to continuing medical education, emergency medicine specialty training, and quality improvement frameworks emphasized a need for more professional development opportunities. International collaboration and knowledge transfer programs could have a significant role to play in quickly addressing emergency care training needs and developing local capacity for sustainable performance improvement.

While the regulatory environment for emergency care in Iraq is still evolving, and policy development and quality assurance requirements are being developed, the study results provide credible evidence to support policy development and implementation of a regulatory framework. However, successful quality improvement does not only initiate with proper regulations, there must be sufficient resources and technical capacity to implement and enforce them.

The COVID-19 pandemic has demonstrated the importance of emergency departments being prepared for health system surge capacity across the systems worldwide. While this study was conducted in the post-acute phase of the pandemic, the findings have important implications with

respect to emergency preparedness and response capabilities. The resource constraints and performance challenges identified in this evaluation indicate there are vulnerabilities that may significantly limit the ability of Iraqi hospitals to respond to future public health emergencies or mass casualty incidents.

Overall, these findings suggest that improving the performance of emergency departments will require a multi-faceted approach that addresses a myriad of components of healthcare delivery in a simultaneous way. Delivering isolated interventions aiming at improving certain performance domains is unlikely to achieve meaningful, let alone sustained improvement, because of the overlap and interdependence of the factors identified as challenges. Successful performance improvement while needing to address multiple factors for performance improvement and/or sustainability will need aligned and coordinated activity aimed at (i) workforce development, (ii) infrastructure, (iii) supply chain logistics, (iv) quality assurance, and (v) healthcare system alignment.

Conclusion

To sum up the findings of this evaluation, improving the performance of the emergency department in hospitals in Iraq requires a collective commitment from health leaders of grant-makers, funders, and international partners to only develop and implement long-term improvement programs in the efforts to address multi-dimensional challenges as presented from this evaluation. The future of quality and performance of emergency services in Iraq is not only a health sector priority for Iraq but an essential health system quality of care element in strengthening national and international investment in the people of Iraq.

Conflict of Interest

Not available

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