

Emergency Research Status in the Middle Eastern Region

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ABSTRACT

Conducting research in emergency settings is paramount to advance knowledge and experiences on dealing with critically ill patients. However, the involvement of highly vulnerable subjects, who are mostly incapable of consenting to research participation is challenging. This research paper describes the extent of emergency research and its related ethical issues within emergency settings in the Middle East. A literature review covering several databases was conducted. Several studies conducted within the emergency departments in the Middle Eastern region were located. All studies focused on provision of emergency care, while none described aspects of emergency research. Current literature indicates a dearth of research concerning emergency research settings in developing countries mainly in the Middle Eastern region. Up to the authors' knowledge, this is the first research paper to review the available literature on emergency research in the Middle East. Findings from this review suggests that more efforts focusing on emergency research should be encouraged and stimulated in the region, in order to improve the effectiveness and safety of healthcare provision to critically ill patients within emergency departments. Adding to that, our findings stimulate the needs for regulatory bodies and regulations that help overcome the main ethical issues surrounding the principle of obtaining informed consents in emergency settings.

Keywords: Emergency; Research; Middle East; Ethics.

INTRODUCTION

Provision of healthcare in emergency settings should be based on best research evidence to ensure safe, and effective procedures/treatments^[1]. Therefore, conducting research in emergency settings is important to advance knowledge and experiences on dealing and/or treating critically ill patients^[2]. Corresponding to that, a report in 2016 showed that the National Institutes of Health support more studies covering clinical emergency care research^[3]. Emergency settings involve highly vulnerable subjects, who are mostly incapable to provide consent to medical procedures and / or research participation^[4]. Such

emergent problems mandate immediate actions, where healthcare providers are responsible for assuring the provision of effective and safe interventions^[5]. Given the complexity of situations, it would be highly demanding to obtain informed consents (in a timely manner) from unstable patients or their legal representatives in order to provide them with required interventions such as Cardio-Pulmonary-Resuscitation (CPR)^[6]. As a result, such situations represent a substantial ethical challenge to healthcare providers and researchers who basically deal with emergency cases^[7].

Worldwide, since the mid of 70's and according to the Belmont report, researchers and healthcare practitioners must respect the utmost importance of subject's autonomy "respect for the patient's capacity of self-determination, and exercise of personal choice, " ^[8]represented by the

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Received on 14/5/2021 and Accepted for Publication on 28/11/2021.

principle of informed consent^[9]. However, the problematic situation with emergency research originates from the fact that it is not always possible to obtain informed consents from patients who are unconscious, unable to communicate with healthcare providers or researchers, or undergoing tremendous physical and/or psychological stress^[2, 10]. Because outcomes in emergency settings depend mainly on the earliest provided intervention, any delay (even short) to obtain consent (including proxy consent) may cause mortality or loss of survival chances^[11]. In accordance to that the Federal Drug Administration^[12] established a policy in 1996 “Exception from Informed Consent (EFIC)” as an attempt to balance between human right of “Autonomy” and the progress of medical practices and research in emergency settings^[13]. In addition to that the FDA still mandates several protective measures to emphasize on patients autonomy^[14]. First of all, FDA articulates conditions for applying EFIC policy. Such conditions include unexpected case scenarios with life threatening conditions, such as dealing with debilitated or incapacitated patients, lack of proven or satisfactory treatment options, availability of interventions that might achieve direct benefit to the health of patients, feasibility of offering treatments on timely manner (prior to obtaining proxy consent from legally authorized representatives), and community consultation. Such requirements, however, remains unclear and poorly defined to both emergency healthcare practitioners and researchers. Studies have revealed high levels of frustration among emergency researchers within some settings, where physicians have a full power to prescribe, even without an ethical approval, pharmaceuticals that have not been scientifically approved effective and safe for certain medical conditions^[7, 15, 16].

Besides researchers’ and healthcare providers’ opinion about waiving informed consent in emergency settings, many studies have shown that public’s opinion and acceptance to this principle is vague. There is no clear answer to the question of as to whether available

regulations that allow for waiving informed consent in emergency settings could protect public health and human rights^[17]. Worldwide, it is highly recommended to educate populations about medical research within different settings and the importance of public involvement in research. Shedding light on factors that can influence and / or hinder public trust in medical research especially in research without consent is highly needed.

Even though emergency departments in developing countries serve very large populations with increased levels of mortality and critical illnesses^[18, 19], little or no regulations and rules that demarcate emergency practices and research principles are available. As an example, the Jordanian Clinical Research Law of 2001, covers none regarding emergency research and its ethical related issues^[20, 21]. This research paper aimed to review research examining emergency research and challenging ethical issues in emergency situations within developing countries, focusing on Middle East. Application of different ethical rules and regulations permitting research of this kind within this region was the main focus of the current search.

Research Methods

Several databases were searched (September 2020 - February 2021): PubMed, Web of Science, Medline, PsychInfo, Web of Knowledge, and CINAHL. The search terms are listed in Table 1. Research papers were located and individually reviewed by both researchers. Suitability of research papers to be included was based on detailed discussions and agreement between researchers. Final agreement was to locate all peer reviewed papers covering any topic related to emergency medicine and/or research within the Middle Eastern region. References lists of located papers were searched to identify relevant papers. Only articles pertaining to issues of conducting emergency research in developing countries mainly within the Middle Eastern region were included. Research papers published in languages other than English were excluded.

Table 1: Search Terms

Emergency research OR	AND	Ethical issues OR
Emergency medicine		Informed consent OR
		Emergency exception

Results

Considering the wealth of literature on emergency research and its related ethical issues in many developed countries, there was relatively little or no information about emergency research in the Middle East. Using the terms relating to emergency research and ethical issues (Table 1) 639 articles were elicited from all databases collectively. Combining these terms resulted in a total of 41 papers; after reviewing the titles and abstracts two were deemed to be totally unrelated for this review. Among the located studies eight were from Jordan [22-29], nine from Turkey^[30-38], one from Yemen [39], five from Egypt^[40-44], three from Iran^[45-47], five from Lebanon^[48-52], six from Saudi Arabia [53-58] and two from United Arab Emirates (UAE) ^[59, 60]. All located studies are summarized below in Table 2.

Since the mid of 90's, research concerning emergency medicine within emergency settings in the Middle East was conducted^[34, 38]. Located studies focused on the development of emergency care specialty and services and

the status of emergency medical care within different institutions^[22, 36, 48]. In addition, several publications have highlighted the characteristics of emergency care visitors, appropriateness of emergency department visits and the level of satisfaction with provided care^[23, 28, 30, 31, 33, 36, 37]. However, none was found on emergency research and ethical issues associated with it. Unfortunately, studies were not designed to investigate emergency research in any depth, but to describe technical aspects of available emergency medicine and offered practices and/or services. It appears as to confront a situation with major ignorance of scientific emergency research and its associated ethical issues within emergency settings in the Middle East.

Despite the fact that, ample research has been conducted within our region to discuss aspects of ethical considerations in different medical departments^[61-64]. None was found covering such considerations within the field of emergency research. Such results reflect the dearth of evidence on conducting emergency research within the Middle Eastern

Table 2: Summary of located papers covering issues related to emergency medicine practice and research in the Middle-East region

Study (year), ref no	Study design	Country	Study setting	Study sample	Main findings
(1995), 38	Descriptive with recommendations	Turkey	Descriptive	NA	Emergency medical care in Turkey. Future directions
(1995), 34	Cross-sectional, retrospective	Turkey	ED records over one year, from one hospital	NA	Common causes for admission were infectious, respiratory, and neurological diseases. Infectious diseases were the most common cause of mortality.

Study (year), ref no	Study design	Country	Study setting	Study sample	Main findings
(1996), 48	Descriptive with recommendations	Lebanon	Descriptive with recommendations	NA	Startup of education and training programs for health care workers was needed to produce a comprehensive plan for emergency care in Lebanon.
(1997), 22	Descriptive with recommendations	Jordan	Descriptive	NA	Efforts were recommended to extend the EMT programs in Jordan.
(2000), 24	Cross-sectional, retrospective	Jordan	ED records over one month, from one hospital	2841 patients' records	Inappropriate use of emergency services was found to be very common
(2000), 58	Perspective study by external ED physician	KSA	NA	NA	Lack of emergency medicine training programs in the Middle East, so the ED staff is largely expatriate.
(2001), 36	Descriptive with recommendations	Turkey	Descriptive	NA	Developing international collaboration in the Middle East region to promote emergency medicine specialist in the national emergency care system.
(2003), 28	Cross-sectional, retrospective	Jordan	ED records over 6 months, from one hospital	29463 patients' records	Frequent non-urgent ED visits adversely affect the quality of provided care and patients' satisfaction
(2003), 33	Cross-sectional, prospective	Turkey	Hospital-based survey in the ED at one hospital over 2 weeks	1155 patients	High rate of inappropriate ED services usage
(2004), 30	Cross-sectional, prospective	Turkey	Hospital-based survey in the ED at one hospital over 2 weeks	1113 patients	healthcare providers and the hospital characteristics had the greatest impact on overall satisfaction of ED patients
(2005), 31	Cross-sectional, prospective	Turkey	Hospital-based survey in the ED at one hospital over 6 months	245 patients	Good patient satisfaction was related to high quality care and insurance restrictions, while lengthy waiting time was the main reason of dissatisfaction

Study (year), ref no	Study design	Country	Study setting	Study sample	Main findings
(2006), 37	Cross-sectional, retrospective	Turkey	ED records over 6 months, from one hospital	3422 patients' records	Acute abdomen (bleeding) was the most common reason for emergency surgery
(2007), 23	Cross-sectional, retrospective	Jordan	ED records over one year, from one hospital	73259 patients' records	Most common causes of ED visits (e.g. chest pain and CVS disorders, SOB and RS disorders, abdominal pain and GI disorders)
(2009), 27	Cross-sectional, prospective	Jordan	Hospital-based survey in the ED at one hospital over 2 weeks	4592 patients	Good patient satisfaction was indicated with some complaints on long waiting time and insufficient staff and beds
(2009), 59	Descriptive with recommendations	UAE	NA	NA	The development of a regional or national program for accreditation in emergency medicine will be important
(2010), 26	Cross-sectional, retrospective	Jordan	ED records over one month, from one hospital	4950 patients' records	Inappropriate use of emergency services was found very common by non urgent cases.
(2010), 32	Cross-sectional, prospective	Turkey	ED records over 2 months, from one hospital	2079 patients	Number of ED admissions and clinical features of ED patients were not different during the month of Ramadan
(2011), 47	Cross-sectional, prospective	Iran	Hospital-based survey in the ED at one hospital over one week	500 patients	Efforts on shortening waiting time and improving patients' perceptions about waiting in ED, as well as improving the overall cleanliness of the emergency room are highly recommended.
(2012), 35	Cross-sectional, retrospective	Turkey	ED records over one month, from one hospital	21014 patients	Approaching one quarter of ED visits were inappropriate, where inappropriate use of ED resources was more frequent during specific shifts.
(2013), 25	Official letter with recommendations	Jordan	ED records 2006-2011	Patients' records over 6 years	Supportive of the involvement of GP and FM in ED practice

Study (year), ref no	Study design	Country	Study setting	Study sample	Main findings
(2013),4 5	Cross-sectional, prospective Validation study	Iran	Hospital-based survey in the ED at one hospital over 5 months	1104 pediatric patients ESI tool used by pediatric trained nurses (12) and physicians (4)	Admission rate increased as the ESI score decreased.
(2013), 50	Descriptive with recommendations	Lebanon	Description of history of prehospital emergency care development with description of existing services.	NA	Emergency medical status is related to limited human resources, insufficient technical resources, scarce high-level management and system-thinking leadership, and gaps in public education efforts.
(2013),4 6	Cross-sectional, retrospective	Iran	ED records over one month, from one hospital	1923 patients ED visits	Inappropriate ED visits was associated with evening and night shifts, payment by health insurance, and the ED visit reason was to obtain rapid treatment
(2013), 40	Descriptive with recommendations	Egypt	Descriptive with recommendations	NA	Emergency medicine as specialty suffered from unqualified personnel from other specialities and lacking of resources
(2014), 49	Cross-sectional, prospective	Lebanon	Hospital-based survey in the ED at all ED departments hospital over 6 months	62 managers and/or directors of ED	Noninvasive positive pressure ventilation is more frequently used in EDs in private hospitals.
(2014), 60	Descriptive with recommendations	UAE	NA	NA	Creation of the Emirates Society of Emergency Medicine, the availability of residency training sites, and the development of fellowship programs, will advance emergency medicine specialty
(2014), 57	Cross-sectional, prospective	KSA vs. USA	Online survey for emergency programs at multiple hospitals in KSA and USA over 2 months	73 emergency residents	The Saudi residents see more patients per hour compared to US peers. Saudi trainees felt less competent in less common procedures than US trainees. In KSA, compared to USA, less formal didactics and simulation experience emergency training was evident.

Study (year), ref no	Study design	Country	Study setting	Study sample	Main findings
(2015), 29	Cross-sectional, prospective	Jordan	Hospital-based survey in the ED at one hospital over one year	63 healthcare providers	Good healthcare providers' satisfaction about the implemented morning report in clinical management of ED cases
(2015), 41	Cross-sectional, prospective	Egypt	Hospital-based survey in one hospital over one month	128 Emergency nurses 147 non-emergency nurses	Nurses working in emergency hospital experienced a higher level of different types of workplace violence
(2015), 56	Cross-sectional, prospective Validation study	KSA	Hospital-based case scenario assessment at one tertiary-care-center	10 emergency nurses	The Canadian Emergency Department Triage and Acuity Scale has good reliability among emergency department
(2016), 43	Cross-sectional, prospective	Egypt	Hospital-based survey in the ED at one hospital over 6 months	266 and 284 emergency physicians and nurses, respectively	About one-quarter of study nurses and physicians suffered from high levels of burnout syndrome.
(2017), 53	Cross-sectional, retrospective	KSA	Hospital-based interview in ED at 6 centers over 5 months	437548 patient ED visits	Low levels of readiness of EDs in academic hospitals to manage pediatric patients with critical missing components needed for pediatric emergency care
(2017), 54	Cross-sectional, prospective	KSA	Hospital-based survey in the ED at one hospital over 6 months	250 patients	Rapid emergency medicine score is beneficial for the risk stratification of patients present with chest pain to the EDs.
(2017), 55	Letter to the editor	KSA	NA	NA	High priority to identify challenges of EMT to allocate available resources with the goal of producing competent, Saudi-trained EMTs.
(2018), 39	Cross-sectional, prospective	Yemen	Hospital-based survey in the ED at one hospital over 2 weeks	531 healthcare providers	Insufficient knowledge of Yemeni health professionals regarding emergency and disaster preparedness.

Study (year), ref no	Study design	Country	Study setting	Study sample	Main findings
(2018), 42	Cross-sectional, prospective	Egypt	Hospital-based survey in the ED at one hospital over 4 months	149 patients	Transport time for patients from injury to hospital arrival was around 4 hours, and mean ambulance response time was 45 minutes.
(2018), 44	Cross-sectional, prospective	Egypt	Hospital-based survey in the ED at one hospital over 3 months	108 emergency physicians	Most of the physicians serviced on average 20-40 patients per shift, and worked for 40–60 working hours per week. Thus, their Professional quality of life was affected.
(2018), 51	Cross-sectional, retrospective	Lebanon	ED records over one year, from one tertiary-care-center	12,637 pediatric ED visits	Fever of unknown origin, external injuries, upper RS infections, open wounds, and abdominal pain were the most common reasons for pediatrics ED visits
(2018), 52	Cross-sectional, retrospective	Lebanon	ED records over 6 years, from one	108 patients	ED visits by suicidal attempters were carried out predominantly at home, on a weekday, and by using overdose on prescription drugs.

Abbreviations:

NA: Not applicable or not available; ED: Emergency Department; CVS: Cardiovascular system; SOB: Shortness of breath; RS: Respiratory system; GI: Gastrointestinal; GP: General practitioner; FM: Family medicine; EMT: Emergency medicine training; KSA: Kingdom of Saudi Arabia; US: United States; UAE: United Arab Emirates.

Discussion

Emergency research is essentially important and necessary to enhance and improve public health related outcomes. In the Middle East, emergency settings are crowded by several endemics and outbreaks [65]. Therefore, it is important to highlight ethical issues related to emergency research in such setting.

Based on the findings of our literature review, data related to emergency medicine research and ethical governors in MENA region is scarce, and research field in emergency settings is a shady, mysterious area. A potential explanation to this finding is lack of enforced regulations related to emergency research, and disciplinary rules as reported in the review of national research ethics guidelines in Arabic Middle Eastern countries conducted by Alahmad and colleagues [39]. There was a lack of regulations related to research ethics in vulnerable persons

except in Egypt and Qatar where this area was covered in local regulations of both countries. In general, local research highlights the needs for more clinical-research and bioethics focused training, which might be initiated by the development and enhancement of educational approaches for healthcare professional students [66]. Additionally, the problem of medication shortage [67] and low doctor to patient ratio at emergency departments compared to the acceptable ratio as promulgated by WHO, and overcrowded emergency departments in developing countries [39] rendering such setting as less favorable environment for research despite its highly dynamic nature and the vast potential for research conduction.

Furthermore, lack of social awareness, false beliefs related to the concept of research, limited research funding, as well as misunderstanding of research-related terms such as informed consent and legal guardian could

further restrict research in developing countries in general, and in incapacitated emergency departments' patients in particular^[39].

Another confounder related to emergency research is the potential conflict related to legal surrogate in light of the absence of the term (durable power of attorney) in MENA region. This aspect is partially governed by local cultural issues and lack of advance care planning in low-income MENA countries^[39]. As dictated by cultural beliefs, the role of surrogate is assigned by default to the spouse, older son of the family, or to the older brother based on the depth of familial relationship and inferences.

The strength of the present review lies in covering an important overlooked field that has not been covered by other research conducted in the MENA region. Furthermore, extensive literature review and rigorous search of pertinent studies was followed to prepare this review. As aforementioned, different engines were searched using different search terms. This adds to the reliability of our results. Likewise, it is important to report the possible limitations. Firstly, the limited number of published papers in the scope of emergency research in the MENA region could hinder the accountability of the review. Besides, exclusion of non-English papers is another potential limitation.

The present review is expected to impact the current practices related to emergency research. Reported deficiencies in the area of emergency research should alarm the regulatory authorities to set some rules to better outline research conducted in emergency settings. Additionally, educational campaigns targeting general population should be reinforced to raise awareness level

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related to responsible conduct of research, and to stress the importance of research in saving lives of patients and their relatives. Future research assessing population and emergency care providers' perception towards research and related terms, including informed consent is recommended in MENA region to better spot barriers compromising research as perceived by emergency healthcare providers and general population.

Conclusion

The present review highlighted the lack of contemporary data to fully appraise emergency research in the Middle East. Any conducted research in this field is based upon tenuous evidence along vague rules, and this underlines the importance of enforced regulations to protect the welfare of general population and feature scientific emergency services and practices. Noteworthy, Middle Eastern region is geographically close to European countries, which have well-established rules and regulations related to research within emergency settings. As guided by political instability, the Middle East has flooded a significant percentage of refugees to neighboring developed countries, including Europe. The present review highlight the imminent needs to prepare and enact firm rules and regulations better regulate all aspects of medical experiments on human subjects, including emergency research in the Middle East. As a future direction, alignment of consolidated rules and regulations that govern emergency research in the Middle East should improve implemented services and practices within emergency settings in different countries.

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وضع البحث في حالات الطوارئ في منطقة الشرق الأوسط

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ملخص

يعد إجراء البحوث العلمية في حالات الطوارئ أمراً بالغ الأهمية لتعزيز المعرفة والخبرات حول التعامل مع المرضى ذوي الحالات الحرجة والطارئة. ومع ذلك، فإن إشراك هؤلاء المرضى، والذين هم في الغالب غير قادرين على الموافقة والمشاركة في البحث، يمثل تحدياً كبيراً للباحثين ولمزودي الرعاية الصحية. تصف هذه الورقة البحثية الوضع العام للأبحاث في حالات الطوارئ والقضايا الأخلاقية ذات الصلة في منطقة الشرق الأوسط. حيث تم إجراء مراجعة شاملة للعديد من قواعد البيانات وقام الباحثين بتحديد العديد من الدراسات التي أجريت داخل أقسام الطوارئ في منطقة الشرق الأوسط. ركزت جميع الدراسات المنشورة على انماط توفير الرعاية الطارئة، بينما لم يصف أي منها جوانب الأبحاث العلمية في حالات الطوارئ. تشير الأبحاث العلمية الحالية إلى ندرة الدراسات المعنية بطروف البحث في حالات الطوارئ في البلدان النامية بشكل عام وفي منطقة الشرق الأوسط بشكل خاص. تعتبر هذه الدراسة الأولى من نوعها لمراجعة الأبحاث المتوفرة حول طبيعة أبحاث الطوارئ في الشرق الأوسط. تشير النتائج المستخلصة من هذه المراجعة إلى أهمية تشجيع وتحفيز المزيد من الجهود التي تركز على أبحاث الطوارئ في المنطقة، من أجل تحسين فعالية وسلامة توفير الرعاية الصحية لمرضى الحالات الحرجة داخل أقسام الطوارئ. إضافة إلى ذلك، تعبر نتائج هذه الدراسة عن الحاجة لهيئات ومؤسسات تنظيمية تساعد في التغلب على القضايا الأخلاقية الرئيسية المتعلقة بمبدأ الحصول على موافقات مستنيرة للمشاركة في الأبحاث المعنية بحالات الطوارئ. الكلمات الدالة: حالات طوارئ، أبحاث، أخلاقيات، منطقة الشرق الأوسط.

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تاريخ استلام البحث 2021/5/14 وتاريخ قبوله للنشر 2021/11/28.