



## Original article

## A mandatory Emergency Medicine clerkship influences students' career choices in a developing system

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## ABSTRACT

**Background:** Attracting medical students for a front-line specialty, Emergency Medicine, is challenging in many countries. The available literature is scarce and bounded to the mature emergency care and education systems. In the countries where emergency medicine is a new specialty and has different contextual needs, the perception of the students and their career interest in emergency medicine specialty is an unanswered question.

**Objective:** We aimed to study the effects of a mandatory Emergency Medicine (EM) clerkship on students' perceptions and their future career choice to be emergency physicians.

**Methods:** A voluntary de-identified survey was prospectively collected before and after the EM clerkship to capture students' perceptions in four domains (EM clerkship, EM physicians, EM patients, and EM specialty as a career choice). The survey included 24 statements having five-point Likert scale for each statement. Non-parametric Wilcoxon signed rank test was used for statistical analysis.

**Results:** Sixty-seven students responded to both surveys (response rate of 85%). Students' perceptions have significantly improved on the EM physicians, and their job after attending the clerkship ( $p < 0.001$ ). They found EM a respected ( $p = 0.038$ ), flexible ( $p < 0.001$ ), secure ( $p < 0.001$ ), satisfying, and prestigious ( $p = 0.006$ ) job. They found EM physicians compassionate ( $p < 0.011$ ), have adequate patient contact ( $p < 0.045$ ) and control on their time (0.004). Choosing EM as a future career has significantly increased after clerkship ( $p < 0.001$ ).

**Conclusions:** Our mandatory EM clerkship significantly improved students' perceptions on EM specialty as a future career choice. A well-structured and mandatory EM clerkship can attract more students to be trained in the EM.

## African relevance

- One major challenge for emergency medicine in developing systems is the lack of adequate workforce
- In newly developing emergency medicine systems, students' perception on the specialty can be suboptimal. This may negatively affect their decision on pursuing career in emergency medicine
- Improving medical students' perception on emergency medicine through clerkships may encourage them to choose emergency medicine as a future career. This may help to overcome workforce challenge.

## Introduction

Emergency Medicine (EM) specialty achievements are growing globally with official recognition of its training in more than 80 countries [1]. Despite that, there are limited undergraduate EM training programs in countries implementing modern emergency medicine training [2–6]. Therefore, available information about students' perceptions on EM mainly stem from countries having advanced EM establishment and training [7–10].

As population grows, more hospitals including emergency departments (EDs) are needed. The gulf countries, including the United Arab Emirates (UAE), have a lack of local healthcare professionals and depend mainly on expatriates [11]. Accordingly, training local doctors

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including emergency physicians is highly demanded [12–14]. Exploring students' perceptions and interests towards medical specialties helps medical education planning based on workforce demands. This will reflect positively on patient's care [12,15].

The UAE recognized EM as a separate specialty with full privileges in 2004. The first residency training program started in 2007 [1,16]. Currently, there are six EM residency-training programs in the UAE. They provide excellent learning opportunities for medical students at different medical schools. Students rotate in well-established hospitals alongside the EM residents and attending physicians [12–14].

Although EM residency training in UAE is well-structured and standardized nationwide, there are variations of undergraduate EM education in different medical schools [5]. At present, there are seven medical schools in the UAE. Many of them provide 1–2 weeks unstructured rotations for medical students in the EDs. To the best of our knowledge, the College of Medicine and Health Sciences (CMHS) at UAE University (UAEU) is the only college that has a mandatory EM clerkship in UAE, which started in 2013. The final year medical students have a 4-week EM clerkship, which is run according to the international EM education recommendations [5]. We aim in this prospective observational study to evaluate the effects of our EM clerkship on students' perceptions and their future career aspiration to be emergency physicians.

## Methods

### Ethical approval

The UAEU Research and Graduate Studies Ethics Committee approved the study.

### Study setting and participants

This study was conducted at the CMHS during the academic year 2015–2016. The study participants were sixth (final) year medical students.

### Emergency Medicine clerkship design

Medical students at the CMHS study for six years followed by 1-year internship. EM is a four-week mandatory clerkship for sixth-year medical students. The undergraduate EM curriculum was developed according to The Society for Academic Emergency Medicine and International Federation for Emergency Medicine recommendations [17,18]. The clerkship included teaching and learning, assessment, and feedback activities throughout the four weeks. Twelve clinical shifts were divided between the two main hospitals (Tawam and Al Ain) in the city. Both hospitals are community-based teaching hospitals affiliated with the medical college. Each has more than 100,000 annual ED patient visits. Students work shadowing residency trained emergency physicians in both EDs. The Tawam hospital has The Accreditation Council for Graduate Medical Education-International accredited 4-year EM residency program. The details of our EM curriculum have been published before [5].

### Data collection

A voluntary de-identified survey was prospectively collected from the students before (entry survey) and after (exit survey) the EM clerkship to capture their perceptions in four domains (EM clerkship, EM physicians, EM patients, and EM specialty as a career choice). We used the survey questionnaire of Lamba et al. because it was the established number of questionnaires were limited at the time of the study design and it was fitting to our aim [8]. This survey included 24 statements having five point Likert scale for each statement (Strongly disagree [1 point], Disagree [2 points], Neutral [3 points], Agree [4 points], Strongly Agree [5 points]). Surveys were collected on the first and last

days of the clerkship. Each student used the same personalized de-identified code in the entry and exit surveys. Both surveys were prepared and applied in the online tool Socrative [19]. The results were extracted to Excel form.

### Data analysis

Non-parametric Wilcoxon signed rank test was used to compare individual student's perception before and after the clerkship. A  $p$  value of less than 0.05 was accepted as statistically significant. Data were analyzed using the Statistical Package for the Social Sciences (IBM-SPSS version 26, Chicago, IL).

## Results

Seventy-nine final year medical students (25 male, 54 female) received EM clerkship training during 2015–2016 in five groups of 12 to 19 students each. Sixty-seven students responded to both entry and exit surveys (response rate of 85%), and were included in the analysis.

Table 1 compares the changes of students' perceptions on clerkship expectations and their career choice after attending the EM clerkship. It was assuring that there were no change of the students' perception about the clerkship's hands on learning experience ( $p = 0.13$ ), the way they were treated in respect ( $p = 0.14$ ), and level of difficulty of the clerkship ( $p = 0.19$ ).

It was very encouraging that choosing EM as a future career has significantly increased between students ( $p < 0.001$ ). The improved conceptions included proper quality of life of EM ( $p < 0.001$ ), proper financial reward ( $p = 0.007$ ) and serving underserved sick patients ( $p = 0.006$ ).

Table 2 compares the changes of students' perceptions on the professional lives and prestige of EM physicians, their job, and ED patients. Their perceptions significantly improved after attending the clerkship ( $p < 0.001$ ). They found emergency medicine a respected ( $p = 0.038$ ), flexible ( $p < 0.001$ ), secure ( $p < 0.001$ ), satisfying, and prestigious ( $p = 0.006$ ) job. They found emergency physicians compassionate ( $p < 0.011$ ), have adequate patient contact ( $p < 0.045$ ) and control on their time (0.004). Nevertheless, their perceptions regarding burnout did not change as they thought that emergency physicians are susceptible to

**Table 1**

Comparison of students' perception on clerkship and emergency medicine as a career choice before and after the EM clerkship.

Domains and statements	Before EM rotation		After EM rotation		$p$ value
	Median (Min-Max)	Mean (SD)	Median (Range)	Mean (SD)	
<b>EM clerkship</b>		3.72 (0.52)		3.80 (0.68)	0.22
Hands on learning experience	4 (1–5)	4.19 (0.86)	5 (1–5)	4.37 (0.81)	0.13
An easy rotation	3 (1–5)	2.54 (0.89)	3 (1–5)	2.76 (1.21)	0.19
To be treated with professionalism	4 (3–5)	4.43 (0.61)	4 (2–5)	4.27 (0.81)	0.14
<b>EM specialty as a career</b>		2.82 (0.73)		3.29 (0.88)	<0.001
I see EM as a future lifestyle	3 (1–5)	2.64 (0.95)	3 (1–5)	3.09 (1.29)	0.007
I see EM as a future financial reward	3 (1–5)	2.60 (0.92)	3 (1–5)	3.15 (1.07)	<0.001
I see EM as the opportunity to serve the underserved	3 (1–5)	3.51 (0.93)	4 (1–5)	3.81 (0.80)	0.006
I can choose EM as my future career (EM-interested)	3 (1–5)	2.52 (0.89)	3 (1–5)	3.12 (1.14)	<0.001

$p$  value = Wilcoxon signed rank test.

**Table 2**

Comparison of students' perception on the EM physicians and patients before and after the EM clerkship.

Domains and statements	Before EM rotation		After EM rotation		p value <sup>#</sup>
	Median (Min-Max)	Mean (SD)	Median (range)	Mean (SD)	
<b>EM Physicians</b>		3.42 (0.45)		3.74 (0.52)	<0.001
Have prestige in the local community	4 (1–5)	3.46 (0.89)	4 (1–5)	3.76 (0.96)	0.039
Are respected by other physicians	4 (1–5)	3.66 (0.95)	4 (1–5)	3.91 (0.97)	0.038
Have a flexible work schedule	2 (1–5)	2.57 (1.03)	3 (1–5)	3.25 (1.05)	<0.001
Have a predictable work schedule	3 (1–5)	2.69 (1.02)	3 (1–5)	3.16 (1.15)	0.004
Have job security in the future	3 (1–5)	3.13 (0.74)	4 (125)	3.61 (0.83)	<0.001
Are generally satisfied with their career choice	3 (1–5)	3.22 (0.81)	4 (1–5)	3.64 (0.98)	0.006
Make less income relative to others	3 (1–5)	2.90 (0.82)	3 (1–5)	3.13 (0.85)	0.051
Are compassionate providers	4 (1–5)	3.54 (0.77)	4 (2–5)	3.87 (0.74)	0.011
Have adequate patient contact	4 (2–5)	3.69 (0.96)	4 (1–5)	3.94 (0.95)	0.045
Use technical skills and procedures	4 (2–5)	4.18 (0.67)	4 (3–5)	4.22 (0.60)	0.650
Perform primary healthcare tasks to patients	4 (2–5)	3.94 (0.72)	4 (3–5)	4.25 (0.61)	0.009
Deal with behavioral problems	4 (2–5)	3.78 (0.69)	4 (2–5)	4.01 (0.64)	0.056
Are susceptible to burnout	4 (2–5)	3.75 (0.75)	4 (2–5)	3.85 (0.86)	0.340
<b>Patients in the EM Department</b>		3.53 (0.48)		3.83 (0.58)	<0.001
Have a variety of ailments	4 (2–5)	3.61 (0.67)	4 (2–5)	3.91 (0.69)	0.006
Often need critical (ICU) care	3 (2–5)	3.42 (0.76)	4 (2–5)	3.67 (0.88)	0.016
Improved symptoms while in ED	4 (2–5)	3.76 (0.65)	4 (2–5)	4.16 (0.71)	0.001
Are compliant with their follow up treatment	3 (1–5)	3.31 (0.76)	3 (2–5)	3.57 (0.78)	0.028

p value = Wilcoxon signed rank test.

burn out.

The clerkship significantly improved the perception of the students on characteristics of ED patients. The students thought that patients have a variety of presentations ( $p = 0.006$ ), needed critical care ( $p = 0.016$ ), were compliant ( $p = 0.028$ ), and that they significantly improved while being in the ED ( $p = 0.001$ ).

## Discussion

Our study has shown that a mandatory well-structured EM clerkship significantly improved medical students' positive perceptions on the EM specialty, its physicians, and patient population. Medical students were more encouraged to choose EM as their future career aspirations.

EM is an important component of medical school curricula because medical students have to manage medical emergencies after graduation [4]. The variation of students' exposures during their training affects their perceptions and future career choices [8–10]. Students may have accurate perceptions about a specialty in a mature system. Nevertheless, even in a newly developing system, like ours, proper clinical exposure affects their perceptions, professionalism, and future career choices

[12,20–23].

Contrary to our results, Lamba et al. found no effects of the EM clerkship on students' perception of EM specialty, its physicians, and patients [8]. They attributed this to students' dissatisfaction with their clinical exposure. Students usually do not encounter recommended experiences during their EM clerkships [24,25]. However, community-based experiences give better exposure to students and improves their perceptions about their clerkships [26]. This may explain the improved students' perceptions in our study because both our affiliated hospitals are community-based teaching hospitals. Furthermore, our mandatory clerkship was the first exposure to EM by our students. Previous exposures could have diluted the positive perception changes [8]. Additionally, mandatory clerkships have more effect on students compared with optional clerkships [27]. Our students worked shadowing EM residents and EM residency core-faculty members in the majority of their clinical shifts. Having a parallel EM residency program, similar to ours, positively affects students' perceptions [10,28].

Similar to others, our students showed higher expectations of our EM clerkship in the entry survey [8,27,29]. Their perceptions did not improve in this area after the clerkship. These expectations include hands on experience and patient variety. Improvements are difficult to show if the quality of the clerkship is already high [8]. Our clerkship is a concentrated and highly demanding one because of its short and busy schedule [5]. Therefore, as expected, the level of difficulty did not change.

Our medical students' perceptions on emergency medicine and physicians significantly improved. They found emergency medicine a respected, flexible, secure, satisfying, and prestigious job. These findings were aligning with the physicians' perceptions [30]. Furthermore, they found emergency physicians compassionate, have adequate patient contact, and have control on their time. Nevertheless, the risk of burnout was well-recognized by them. This indicates that our students were capable of identifying the risks of EM [31].

Factors affecting future career choices include lifestyle, role models, residency length, and clerkship experience [9,12,27]. In our study, the significant improvement of perceptions and aspirations for a future EM career is higher than those reported in the literature [7,8,29]. Our EM undergraduate clerkship is delivered during the final academic year. Early exposure in earlier years may further influence students' perceptions and career choices [10,15,28,32].

## Limitations

We have to acknowledge that our study has its own limitations. *First*, it is a single center study involving one academic year, which limits its generalizability. *Second*, we preferred to adopt an established validated survey, which was developed by a group of EM faculty members and tested in a country where EM is a mature and advanced specialty. However, there may be contextual differences between two settings and we did not interrogate additional statements that may apply to our context. *Third*, we did not include open statements to support the findings with qualitative analysis. *Fourth*, the sample size was relatively small. Nevertheless, comparing changes within the same subjects has reduced the variation and addressed this concern. *Finally*, we did not follow up the students' final residency choice, which could have changed when rotating through other specialties. Nevertheless, the positive changes of our students' perception towards EM are very encouraging and promising.

## Conclusions

Our mandatory EM clerkship significantly improved students' perceptions of EM specialty as a future career choice. Improved student perceptions after the clerkship can increase medical students' interest to be trained in the EM.

## Dissemination of results

Results from this study was shared with faculty members of emergency medicine through an informal presentation in order to get their feedback. The results were not published or shared elsewhere.

## CRediT authorship contribution statement

Authors contributed as follow to the conception and design of the work (AAC, EDC); the acquisition (AAC), analysis and interpretation of data for the work (FAZ, AAC), reference search and constructing available information in the literature (EDC) and drafting the work or revising it critically for important intellectual content (AAC, EDC, SS, MEZ and FAZ).

AAC contributed 50%; EDC contributed 20%; and SS, MEZ and FAZ contributed 10% each.

All authors approved the version to be published and agreed to be accountable for all aspects of the work.

## Authors' contributions

Authors contributed as follow to the conception or design of the work; the acquisition, analysis, or interpretation of data for the work; and drafting the work or revising it critically for important intellectual content: AAC contributed 50%; EDC 20%; and SS, MEZ and FAZ contributed 10% each. All authors approved the version to be published and agreed to be accountable for all aspects of the work.

## Declaration of competing interest

The authors declared no conflicts of interest.

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