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Satisfaction of Residents and Medical Students at Jordan University Hospital with the Transition of the Academic Day

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Abstract

Background: Education in emergency medicine (EM) has moved toward using simulation training in view of the success of such training in skill development. The Emergency Department (ED) at Jordan University Hospital (JUH) moved away from the conventional daily lecture training curriculum, constrained by crowding of the ED and variations in the on-call schedule, towards a weekly academic day including grand/core rounds, simulation, and journal clubs as of July 1, 2023.

Methods: A cross-sectional survey was conducted among residents, medical students, interns, and specialists rotating the ED after the introduction of the new academic day. Data collection period was from March 2024 to October 2024. Among 75 participants, 55 (73.3%) were fifth-year medical students, 11 (14.7%) junior residents, 6 (8.0%) senior residents, 2 (2.7%) specialists, and 1 (1.3%) intern. The self-administered survey included 7 domains addressing satisfaction with the old system, satisfaction with different elements of the new system, and a comparison of the two systems; internal consistency was measured by Cronbach's alpha.

Results: Participants were predominantly female (60%) and 20-25-year-olds (81.3%). Internal consistency for the seven categories ranged from acceptable to excellent (α = 0.787-0.990). Grand/core rounds and simulation-based training yielded the highest composite satisfaction scores (3.73±0.64 and 3.68±0.73, respectively), being above satisfaction levels for the previous short-lecture system (3.64±0.70), while the lowest score was obtained for journal club (3.54±0.85). Direct comparison revealed that participants preferred the new system, although many chose either not to answer or "not applicable," especially when dealing with those questions which required any experience of the old system.

Conclusion: Positive satisfaction level with the new simulation-centered academic day was demonstrated by residents and medical students in regard to grand/core rounds and simulation training, in contrast to the lower satisfaction with the journal club. This indicates that simulation curricula can be used in EM training programs as an alternative learning format.

Keywords: Simulation, Teaching, emergency medicine residency program.

Background:

Emergency medicine (EM) training programs worldwide have particularly embraced simulation-based learning (Ilgen JS, 2013)[1]. Emergency medicine integrates a broad range of medical knowledge into a functional base of clinical knowledge (Takayesu JK, 2010)[4]. Simulation allows educators to provide standardized learning experiences in contrast to the uneven quality of most clinical curriculums (MD., 2009)[2]. It also provides a risk-free environment for learners to enhance their clinical skills, and to develop their leadership and collaborative abilities (Okuda Y, 2009)[3]. Prior to this change in educational technique, the training process for residents and students at the ED of Jordan University Hospital (JUH) was characterized by a large amount of daily lectures based on Rosen's emergency medicine topics and personal experience in order to introduce students to case scenarios. However, this training method suffered from several limitations such as ED crowding and inconsistent on call schedule which restricted

attendance to lectures and made experiential learning difficult, and the lack of exposure to case scenarios beyond personal clinical experience.

Considering these weaknesses, however, the Teaching Curriculum of the ED in JUH changed from the conventional method of having lectures daily to conducting an academic day every week, which includes grand/core rounds, simulation sessions, and journal clubs, starting July 1, 2023. This study was conducted to evaluate the level of satisfaction among the residents, medical students, interns, and specialists who had rotated in the ED.

Methods:

This is a cross-sectional survey research study done at the ED of JUH after the start of the new weekly academic day from July 1, 2023. Data were collected using an English structured questionnaire specifically developed for the purpose of this study. A version of the full questionnaire is provided as Supplementary material (Supplementary File 1)

Data were collected from March 2024 to October 2024

The total number of participants who responded to the questionnaire included 75 individuals such as residents, medical students, interns, and specialists rotating in the ED. Out of the total number of respondents, 55 were medical students in their fifth year, 17 were residents including 11 junior and 6 senior residents, 2 were specialists, and 1 was an intern.

A self-administered questionnaire was utilized, where the structure entailed rating the previous educational system before rating the current one followed by the comparison between the two systems. The instrument consisted of seven scored domains:

Domain 1 (7 items, $\alpha = .941$)-satisfaction with the previous short-lecture system (e.g., clarity of content, alignment with current practice, ability to choose the lecture topic).

Domain 2 (7 items, $\alpha = .913$)-satisfaction with simulation-based education (current system) (e.g., preparedness for real-life scenarios, confidence, teamwork).

Domain 3 (13 items, $\alpha = .927$)-satisfaction with grand/core rounds (current system) (e.g., breadth of case exposure, mentorship from expert speakers, decision-making).

Domain 4 (7 items, $\alpha = .990$)-satisfaction with journal club (current system) (e.g., critical appraisal skills, integration of research into practice, relationship-building).

Domain 5 (6 items, $\alpha = .872$)-direct comparison of current vs. previous system for online practice and learning resources.

Domain 6 (5 items, $\alpha = .894$)-direct comparison of current vs. previous system for clinical competency development.

Domain 7 (5 items, $\alpha = .787$)-direct comparison of current vs. previous system for overall training experience.

Characteristics of the subjects and individual questions were described using descriptive statistics (frequencies and percentages). Internal reliability was assessed through Cronbach's alpha, while

composite scores for the domains were reported as mean ± SD (range: 1 to 5).

This study was approved by the IRB at Jordan University in accordance with the 1964 Declaration of Helsinki and the Belmont report. All subjects provided written informed consent.

Results:

The sample had a female predominance of 45 (60%) participants. The majority, 61 (81.3%), were between 20 and 25 years old, and 55 (73.3%) were fifth-year medical students. The largest proportion of participants, 22 (29.3%), lived 6-10 km from JUH (Table 1).

Table 1

Characteristic	Category	n	%
Gender			
	Female	45	60.0
	Male	30	40.0
Age (years)			
	20–25	61	81.3
	26–30	12	16.0
	31–35	1	1.3
	36–40	1	1.3
Role			
	5th-year medical student	55	73.3
	Intern	1	1.3
	Junior resident	11	14.7
	Senior resident	6	8.0
	Specialist	2	2.7
Distance from JUH (km)			
	0–1	8	10.7
	2–5	16	21.3
	6–10	22	29.3
	10–20	18	24.0
	>20	11	14.7

Participation in academic day components:

(Table 2) summarizes reported participation in the components of the current and previous academic systems.

Table 2

Activity	Yes, n (%)	No, n (%)
Attending lectures in Grand/Core rounds	67 (89.3%)	8 (10.7%)
Attending simulation rounds	62 (82.7%)	13 (17.3%)
Attending mortality and morbidity rounds	46 (61.3%)	29 (38.7%)
Attending journal clubs	19 (25.3%)	56 (74.7%)
Attending short lectures in the old system	34 (45.3%)	41 (54.7%)
Presenting lectures in Grand/Core rounds	33 (44.0%)	42 (56.0%)

Most participants, 59 (78.7%), preferred choosing their own presentation topic over being assigned one at random (16, 21.3%).

Reliability and composite satisfaction scores:

Internal consistency for all seven domains was acceptable to excellent (Table 3). The composite satisfaction of the former short lecture approach (Domain 1) was 3.64 ± 0.70. Grand/core rounds (Domain 3) and simulation training (Domain 2) got the highest marks (3.73 ± 0.64 and 3.68 ± 0.73, respectively), both above the satisfaction of the former method. The journal club (Domain 4) got the lowest composite mark (3.54 ± 0.85) with the largest variance

Table 3

Domain	Items	Cronbach's α	Reliability	Composite score (mean ± SD)
1. Previous system – short lectures	7	.941	Excellent	3.64 ± 0.70
2. Simulation-based education	7	.913	Excellent	3.68 ± 0.73
3. Grand/core rounds	13	.927	Excellent	3.73 ± 0.64
4. Journal club	7	.990	Excellent	3.54 ± 0.85
5. Online practice & resources (comparison)	6	.872	Good	N/A – categorical comparison
6. Clinical competency (comparison)	5	.894	Good	N/A – categorical comparison

Domain	Items	Cronbach's α	Reliability	Composite score (mean ± SD)
7. Overall experience (comparison)	5	.787	Acceptable	N/A – categorical comparison

Direct comparison of current VS. previous system:

In comparing the current and past systems directly (Domains 5-7), a greater number of those surveyed preferred the current system in most questions. Nonetheless, a considerable number of survey results were found in the "unsure" or "not applicable" responses, specifically regarding questions about tracking progress and receiving feedback.

Discussion:

Implementation of the new academic day:

The implementation of the new academic day has necessitated a radical shift away from the prevailing lecture-based model towards an enriched academic schedule that was designed to strike a balance between theoretical and practical training. In the past, there have been three one-hour lectures spread throughout the week, while the two-week ED rotation for the fifth-year medical students used to be comprised of daily one-hour lectures in the first week on four key topics (acute coronary syndrome, basic life support, tachy- and brady-dysrhythmias, and stroke). However, under the new program, a specially dedicated academic day involves grand rounds, core rounds, simulation rounds, workshops, as well as mortality and morbidity meetings and journal clubs. Core rounds are delivered by experts in EM and the faculty on clinical topics, while grand rounds are given by residents PGY 1-4, with mortality and morbidity meetings taking place monthly, and journal clubs held quarterly. A student academic day for fifth-year medical students occurs every two months for four rotating groups of 31-34 students and includes discussion of five topics (four plus chest and abdominal trauma).

Environment: Simulations are performed in the hospital's educational center where there are three simulation laboratories equipped with a mid-fidelity mannequin (see Figure 1). Plans are being made to increase this equipment. An ultrasonography lab (Sono-lab) located at the School of Medicine has six ultrasonography machines equipped with linear, curved, and phased array probes (see Figure 2).

Participants: Every year the program recruits approximately fifteen residents (PGY 1-4). In addition, fifth-year medical students (and elective year-6 students) are rotating in the ED on two weeks blocks of 30-34 students each, totaling approximately 680 students annually. The faculty involved in the teaching of the curriculum includes an EM consultant (also Assistant Professor of Medicine at the School of Medicine), and three EM specialists as lecturers.

Obstacles: However, implementation did not go without challenges. The procurement of simulation apparatus and setting up a control room to perform high-fidelity simulations needed substantial resources, along with scheduling issues among residents, medical students, and faculty. Getting buy-in from the School of Medicine, School of Graduate Studies, and the administration of the hospital for consistent investment in simulation-based education proved difficult, as did forging relationships with other departments like anesthesia and critical care.

Interpretation of findings:

On balance, the new day format was marginally preferred to the old lecture format for medical students and residents. Journal club had the worst performance out of all the elements when considering both overall satisfaction and real participation.

Greater satisfaction regarding the domain related to simulation-based education (Domain 2) can be explained by the literature stating that simulation training is considered a standardized risk-free environment, where learners build their skills and confidence (Okuda Y, 2009; Ilgen JS, 2013). High scores of grand/core rounds might be explained by their weekly and obligatory character and specialist-led discussions, in contrast to former resident-led lectures, which highly depended on residents' shifts.

The domain of journal club (Domain 4) was assessed with the lowest composite score (3.54 ± 0.85) and lowest participation rate (25.3%). Though there were no questions directly asking about possible reasons of this result in the survey, its quarterly rather than weekly nature, as well as the fact that the lowest scores were associated with journal club's ability to develop relationships between peers (Q4.6, Q4.7) may indicate that this function is underdeveloped. Future research would benefit from including more questions about obstacles to participation in the discussion.

Among the domains where the new and old systems were being compared (Domains 5-7), most people who provided their opinions preferred the new system. However, quite many answers were also found in the "Not sure" and "Not applicable" categories. This is easily understood given that most of the people who participated in the survey were fifth-year medical students, who had no experience with the old system of residents' rotations and therefore could not compare the two systems.

Limitations:

In discussing these results, it is crucial to consider several limitations. The percentage of residents and experts among respondents was quite low, while fifth-year students comprised about three quarters of our sample, which is small and comes from one site. This factor is especially important when it comes to a research paper that mostly deals with the issue of resident satisfaction. Moreover, the evaluations of the previous system are retrospective and, in most cases, second-hand; in other words, a person who has not experienced the previous system cannot give an evaluation of it but merely the impression. In addition, any differences between domains (journal club rating being lower than grand/core rounds rating, for instance) cannot be considered as statistically confirmed results because there was no significance testing.

Conclusion:

This shift in paradigm towards simulation-based education marks an especially important milestone in medical education that will move away from the old saying "see one, do one, teach one" and towards a new simulation-based curriculum. It is believed to be a successful and sustainable model for other EM programs in the region to emulate in the future (Dagnone et al. 2016)[5]. "See one, simulate many, do one competently, and teach everyone." is one of the key principles that have emerged and show the importance of simulation training for the development of clinical skills. The coming changes promise a more practical, immersive, and flexible approach to training medical professionals. However,

additional work needs to be done to verify, evaluate, and measure the benefits of this new curriculum in practice.

Preliminary results of the questionnaire conducted at the Emergency Department of JUH suggest high levels of satisfaction with the proposed changes in the form of the academic day. The questionnaire proved acceptable-excellent internal consistency in all the seven areas, and participants favored the academic day as compared to the lecture-based format, however, with little practical experience in the latter, it was difficult for participants to compare both formats properly. Journal club is considered valuable, but still lacks satisfaction as compared to other parts of the curriculum. This model may be used as a template for similar projects in the region.

List of Abbreviations:

EM: Emergency Medicine,
ED: Emergency department
PGY: Postgraduate years

Declarations:

- Ethical approval:

This study was approved by "Jordan University Institutional review board (IRB), and
This study was performed in accordance with the ethical standards as laid down in 1964 Declaration of Helsinki and Belmont report.

- Consent to participate:

A written informed consent was obtained from all participants for participation.

- Consent to publication:

A written informed consent was obtained from the people seen in photos for the publication of this study.

- Availability of data and material:

All data generated or analyzed during this study are included in this published article.

- Competing interests:

The authors declare that they have no competing interests.

- Authors' contributions:

QS and AA gathered data about the old and new systems and started writing the primary manuscript. HM and EB sorted out the data, organizing it, and making the design of this article. DK and MH did the analysis IA and NA edited the final manuscript. AA wrote the abstract. MA wrote the methods, results, and discussion. All authors had a key role in editing the manuscript. IA took written consent from all people in the attached photos and supervised the teamwork. AAA and AAL Helped with the supervision.

- Funding:

This study required no funding.

-Clinical trial number:

Not applicable

Figure 1, Medium fidelity simulation laboratory, located in Jordan University Hospital



Figure 2, Ultrasound laboratory (Sono-lab) located in the School of Medicine, University of Jordan.



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Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Supplemantrydocument1Questionnaire.pdf