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Assessing Medical Students' Access to Electronic Medical Records in Jordanian Public Universities

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ABSTRACT

Purpose: The aim of this study is to evaluate the extent and quality of EHR access for clinical-year students at public universities in Jordan, as well as the institutional and systemic barriers they face.

Methods: A study was performed by applying a questionnaire on 401 medical students in the clinical years from six public universities in Jordan 2024-2025. A self-developed tool that assesses EHR accessibility and credentialing and student perceptions was therefore used. SPSS v26 was used to analyze data. Descriptive statistics and chi-square tests were employed to describe data.

Results: Most students (95.5%) accessed medical records, but only 2.5% had the official credentialing to cover all hospitals where they rotate. About 16% could only read and 4% could get full access. There were notable links between using EHR and year of the study ($p = 0.017$), university ($p = 0.004$), and availability of computers ($p < 0.001$). Most of the students (84.1%) found that accessing the EHR was useful. However, 76% of students indicated that they did not receive official credentials to access the system and 96% of students indicated that the use of the EHR was not properly supervised or functional.

Conclusions: Even though a lot of informal use of EHRs takes place, medical students in Jordan do not get formal training or credentialing. We therefore propose that, there is an urgent need to a set out structured national policies and institutional reforms to ensure an equitable, supervised and meaningful access to EHRs in under graduate medical education.

Keywords: *Electronic Health Records, Medical Education, Jordan, Credentialing, Clinical Training*

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1. INTRODUCTION

Electronic health record plays a crucial role in the continued healthcare progress aiming to improve patient care quality (1). The witnessed widespread is driven by its potential to effectively reduce costs and aid patient care by enhancing efficiency, information accuracy, and reducing errors. (2, 3) Additionally the availability of comprehensive patient clinical data and the ability to share it with various healthcare providers (4).

The transition to EHR presents potential opportunity to improve learning experiences for medical students. Students utilization of EHRs use can develop their communication skills and enhance their participation as members of the patient care team. (5) The ability to access a holistic view of detection, diagnosis, and management can help them to understand disease prognosis and to follow up on the clinical outcomes of the patient they have observed. (6)

The concern about this transition is the limited medical students' access and its effect on their hands-on practical experience. (7) despite the need for passwords and permissions to use the hospital computers, Student limitations in EHR competency largely impact their medical education and communication within the healthcare system. (8)

A study showed that after completing the mandatory Family Medicine clerkship, a total of 60 students in their third year were asked to fill out a questionnaire for a research study ("Electronic Health Records in Outpatient Clinics: Perspectives of Third Year Medical Students"). By questioning third-year students in a focus group how utilizing the EHR had affected their learning, the authors Rouf et al (9) were able to extract themes for the questionnaire. Five themes surfaced: communication with patients and preceptors, personal performance (charting and presenting), cues from the EHR, access to online resources, and information organization. A sixth theme was introduced by the authors: the effect on patient and student follow-up. The authors utilized a 5-point Likert scale from "Strongly Agree" to "Strongly Disagree" to design a 21-item questionnaire based on these themes. 33 out of 53 consenting students (62%) filed completed questionnaires as a result of the study. The majority of students reported pleasure with the EHR's information organization capacities, with 70% of them saying that it was straightforward to locate important information online. When using the EHR instead of paper records, only 36% and 33% of students, respectively, reported accessing online patient information or clinical guidelines more frequently. Due to EHR prompts, a large proportion of students (72%) said they asked more questions related to their background, and 39% made more orders for clinical preventative care. The majority of students (69%) said that their documentation got better because of the EHR. In comparison to paper chart notes, 39% of students said they got more feedback on their EHR notes. Only 64% of students expressed satisfaction with the EHR's ability to facilitate doctor-patient contact, and 48% said they looked at the patient less frequently. (9)

A study conducted by Almulhem et al (10) entitled "Medical Students' Experience with Accessing Medical Records in Saudi Arabia: A Descriptive Study" showed that second-year to intern medical students from various Saudi Arabian medical schools were invited at random. They were given a self-developed survey. It included 28 elements divided into three categories: basic information about medical students, including the ease with which they access medical data, their familiarity with hospital medical record systems, and the type of medical record they prefer. According to Almulhem et al (10), 83.27% of participants had read-only access, 62.8% of participants had access to medical records, with 66.1% of them having access to EHRs. The majority of the EHR and paper groups (70.1% and 67.1%, respectively) expressed satisfaction with the ease of access to medical records. With U = 5200, Mean Rank = 122.73, and P =.04, the EHR group's experience was superior to that of the paper group. With Mean Ranks of 122.35 and 147.99, respectively, students who went through National Guard and university-owned hospitals described better experiences than those who trained in other educational facilities.

Welcher et al (11) in their study entitled "Barriers to Medical Students' Electronic Health Record Access Can Impede Their Preparedness for Practice" investigate the current state of medical students' access to EHRs, as well as policy recommendations from medical societies, creative models used at certain U.S. medical schools, and other potential solutions. Additionally, they argue that proficiency with EHRs is required for students to become doctors who can fully use these tools, as compared to doctors who believe that EHRs hinder providing high-quality patient care. Finally, the authors believe that EHR-related abilities should be rigorously evaluated alongside other clinical skills and that relevant experiences utilizing EHRs should be regularly included in medical school curricula.

To optimize the learning experience, it's important to understand the current state of EHR integration into Medical Education, so we can identify areas for improvement and develop strategies.

Aims:
This study aims to assess the extent and quality of EHR access for clinical years' medical students in Jordan as well as the challenges they face within the Jordanian healthcare system.

2. METHODOLOGY

Study Design
This research adopted a multi-center, descriptive, cross-sectional design, utilizing a structured questionnaire to assess the extent and quality of electronic health record (EHR) access among clinical-year medical students in Jordan. The design was chosen to capture a broad snapshot of students' experiences across different public universities, allowing for the identification of institutional differences and barriers to access .

Study Setting and Participants
The study targeted medical students in their clinical years (4th–6th years) enrolled in six public medical schools in Jordan: Al-Balqa Applied University, Yarmouk University, Jordan University of Science and Technology, Mutah University, the Hashemite University, and the University of Jordan. Data collection occurred during the second semester of the academic year 2024–2025. Eligible participants were those actively enrolled in clinical rotations at affiliated teaching hospitals. Students in pre-clinical years or those on academic leave were excluded.

Sample Size and Sampling Technique
The minimum sample size was calculated to be 385 participants, based on a confidence level of 95% and a 5% margin of error, using an assumed prevalence of EHR access of 50% to ensure maximum variability. A total of 401 students completed the survey, exceeding the required minimum. A convenience sampling strategy was employed through official student social media groups and academic mailing lists.

StudyInstrument
Data were collected using a self-developed 13-item questionnaire that was specifically developed for this study (see supplementary file 1), organized into three main sections: (1) demographic characteristics (age, gender, year of study, and university), (2) EHR access experience (type and level of access, credentialing status, supervision), and (3) perceived usefulness and barriers to EHR use. The questionnaire was informed by previous literature (Rouf et al., 2008; Almulhem et al., 2021; Welcher et al., 2018) and adapted to the Jordanian clinical education context. Content validity was established through review by three medical education experts. A pilot test was conducted with 20 students, and minor revisions were made for clarity.

Data Collection Procedure
The questionnaire was distributed electronically via official student WhatsApp and Facebook groups for each university, with the assistance of student representatives. Participation was voluntary, and informed consent was obtained electronically before survey access. Respondents could complete the questionnaire on mobile devices or computers. Duplicate responses were prevented by restricting submissions to one per device.

Ethical Considerations
The study protocol was reviewed and approved by the Institutional Review Board (IRB) of Al-Balqa Applied University . Participation was anonymous, and no personally identifiable information was collected. Students were informed that their participation would have no impact on their academic standing.

The study was conducted in accordance with the principles of the declaration of Helesinki.

Data Analysis
Data were analyzed using IBM SPSS Statistics for Windows, Version 26.0 (IBM Corp., Armonk, NY). Descriptive statistics (frequencies and percentages) were used to summarize categorical variables. Associations between categorical variables were tested using the Chi-square test (χ^2). Statistical significance was set at $p \leq 0.05$. Missing data were handled using pairwise deletion.

3. RESULTS

General characteristics of participants

Table (1) shows the general characteristics of the members of the sample. The results show that nearly female students are about 54%. Also, the majority of student members are aged between 18-23 years. Also, about 42% of students are in the fourth year while similar proportions are in the fifth year and the sixth year. Moreover, about 21% of students are from Al-Balqa Applied University. About 17% are from Yarmouk University, 16% are from Jordan University of Science and Technology. Moreover, similar proportions are from Mutah University, The Hashemite University, and The University of Jordan. Almost all medical students use or have access to medical records. Two and half percent of people accessed permission. Among respondents who reported that they were not allowed access, the reasons included hospital policy (1.3%), difficulty of the record system (0.5%) and medical staff instructions (0.2%) Around 22% of medical students thought there were enough computers. About 31% students think that overall access is very useful; about 53% fairly useful; 10.5% poorly useful; 1% not useful, and about 5% off students missed the answers. When it came to official credentialing, the majority of students (76%) reported that they did not get access to them officially. Meanwhile, about 17% did report being given access, though not in all hospitals. Finally, only 2.5% reported that they were officially credentialed in all the hospitals they rotated through. When asked about their credentials, approximately 16% of medical students reported having "read only access", while 4% said they had "full access", with just under 80% saying they didn't know the answers. When it came to answering official credential, under the directions of supervisor by about 2%, and without the directions of supervisor by about 2%, were missed by 96% of students.

Table 1: General characteristics of participants

Variable	Frequency (N)	Percentage (%)
Gender:		
- **Female**	**216**	**53.9%**
- **Male**	**185**	**46.1%**
Age: Years		
- **18-23**	**309**	**77.1%**
- **24-28**	**92**	**22.9%**
Studying year:		
- **Fourth**	**167**	**41.6%**
- **Fifth**	**115**	**28.7%**
- **Sixth**	**119**	**29.7%**
Student University:		
- **Al- Balqa Applied University**	**84**	**20.9%**
- **Jordan University of Science and Technology**	**65**	**16.2%**
- **Mutah University**	**61**	**15.2%**
- **The Hashemite University**	**63**	**15.7%**
- **The University of Jordan**	**59**	**14.7%**
- **Yarmouk University**	**69**	**17.2%**
Accessing to medical records:		
- **Yes**	**383**	**95.5%**
- **No**	**18**	**4.5%**
Accessing allowance:		
- **Yes**	**10**	**2.5%**
- **No**	**8**	**2%**
- **Missing**	**383**	**95.5%**
If no, what are the reasons:		
- **Difficulty of the record system**	**2**	**0.5%**
- **Hospital policy**	**5**	**1.3%**
- **Medical staff instructions**	**1**	**0.2%**
- **Missing**	**393**	**98%**
There are enough computers:		
- **Agree**	**87**	**21.7%**
- **Disagree**	**296**	**73.8%**
- **Missing**	**18**	**4.5%**
Overall access:		
- **Very useful**	**125**	**31.2%**
- **Fairly useful**	**212**	**52.9%**
- **Poorly useful**	**42**	**10.5%**

- **Not useful**	**4**	**1%**
- **Missing**	**18**	**4.5%**
Credential official:		
- **No, I was not given official access**	**304**	**75.8%**
- **Yes, but not in all hospitals I rotated through**	**69**	**17.2%**
- **Yes, in all hospitals I rotated through**	**10**	**2.5%**
- **Missing**	**18**	**4.5%**
If credential is given, level of credential:		
- **Read-only access**	**63**	**15.7%**
- **Full access (read, review, and enter/order data**	**16**	**4%**
- **Missing**	**322**	**80.3%**
If credential is given, did supervisors functionally supervise your entry:		
- **Yes**	**7**	**1.7%**
- **No**	**9**	**2.2%**
- **Missing**	**385**	**96%**

The relationship between accessing medical records and study variables

Table (2) shows the relationship between accessing medical records and other study variables. There were no significant relationships between gender and age of the students with accessing medical records (p=0.540, p=0.378, respectively). There was a significant relationship between studying year and accessing medical records (p=0.017). As a studying year increases, accessing of medical records is more likely to increase. There is also a significant relationship between university student and accessing of medical records (p=0.004). Accessing medical records ranged from 88.1% in Al- Balqa Applied University to 100% in The University of Jordan. Accessing medical records was also significantly associated with accessing permissions (p<0.001). Another significant relationship between accessing medical records and "if no, reasons" (p<0.001). There is a significant relationship between the existence of enough computers and accessing medical records (p<0.001). Another significant relationship between "Overall chance to access medical records" and "accessing medical records" (p<0.001). Another significant relationship between "Giving official credential" and "accessing medical records" (p<0.001). The last two variables "If credential is given, level of credential" and "If credential is given, did supervisors functionally supervise your entry" were not significantly associated with "accessing medical records" (p=0.99, p=0.676 respectively).

Table 2: The relationship between accessing medical records and study variables

Variable	**Accessing medical records**				**Significance**
	No		**Yes**		
	N	%	N	%	0.540
Gender:					
- Female	10	4.6%	206	95.4%	
- Male	8	4.3%	177	95.7%	
Age (years):					0.376
- 18-23	15	4.9%	294	95.1%	
- 24-28	3	3.3%	89	96.7%	
Studying year:					0.017
- Fourth year	13	7.8%	154	92.2%	
- Fifth year	1	0.9%	114	99.1%	
- Sixth year	4	3.4%	115	96.6%	
Student University:					0.004
- Al- Balqa Applied University	10	11.9%	74	88.1%	
- Jordan University of science and technology	2	3.1%	63	96.9%	
- Mutah University					
- The Hashemite University	4	6.6%	57	93.4%	
- The University of Jordan	1	1.6%	62	98.4%	
- Yarmouk University	0	0%	59	100%	
	1	1.4%	68	98.5%	
Accessing permission:					<0.001
- No	8	100%	10	0%	

- Yes	383	100%	0	0%	
If no, reasons:					<0.001
- Difficulty of the medical record system	2	100%	0	0%	
- Hospital policy					
- Medical staff instruction	5	100%	0	0%	
- Missing	1	100%	0	0%	
	10	2.5%	383	97.5%	
There are enough computers:					P<0.001
- Agree	0	0%	87	100%	
- Disagree	0	0%	296	100%	
- Missing	18	100%	0	0%	
Overall chance to access medical records:					P<0.001
- Not useful					
- Poorly useful	0	0%	4	100%	
- Fairly useful	0	0%	42	100%	
- Very useful	0	0%	212	100%	
- Missing	0	0%	125	100%	
	18	100%	0	0%	
Giving official credential:					<0.001
- No, I was not given official access	0	0%	304	100%	
- Yes, but not in all hospitals I rotated through					
- Yes, in all hospitals I rotated through	0	0%	304	100%	
- Missing					
	0	0%	69	100%	
	18	100%	0	0%	
If credential is given, level of credential:					0.99
- Read-only access					
- Full access (read, review, and enter/order data	0	0%	63	100%	
- Missing	0	0%	16	100%	
	18	5.6%	304	94.4%	
If credential is given, did supervisors functionally supervise your entry:					0.676
- Yes	0	0%	7	100%	
- No	0	0%	9	100%	
- Missing	18	4.7%	367	95.3%	

4. DISCUSSION

The findings of this cross-sectional study on electronic health record (EHR) access among medical students in Jordanian universities highlight significant structural and institutional gaps that could influence the preparedness of future physicians. Access to EHRs during clinical training is an essential component of medical education, fostering not only informatics competence but also clinical decision-making, documentation accuracy, and patient engagement skills (11).

Our results indicate that although 95.5% of students reported having accessed medical records, only 2.5% received official credentialing across all hospitals where they trained. This mismatch between unofficial access and institutional endorsement raises concerns regarding the ethical and legal boundaries of EHR use during training. Moreover, nearly 80% of students were unaware of their credential status, reflecting institutional opacity and lack of standardized onboarding protocols. Consistent with prior studies such as the study of Almulhem et al (10), we observed that read-only access was the most common credential level (15.7%), with only 4% receiving full access to enter or modify patient data. This limited interactivity undermines experiential learning, particularly in developing competencies in clinical documentation, order entry, and EHR navigation — skills that are considered essential for residency preparedness (9, 12).

Importantly, statistical analysis revealed that access was significantly associated with studying year (p=0.017), with senior students more likely to report access, suggesting a positive but gradual integration of EHR into the curriculum. This aligns with international trends where clinical immersion correlates with increased EHR interaction (13). However, disparities among universities were significant (p=0.004), ranging from 88.1% in Al-Balqa Applied University to 100% in The University of Jordan. These inter-university inconsistencies may reflect differences in hospital affiliations, administrative

policies, or infrastructure investment in health IT.

The perception of usefulness of EHR access was largely positive; 84.1% of students rated it as very or fairly useful. Yet, only 21.7% agreed there were enough computers available, suggesting that hardware constraints also limit meaningful access. Adequate EHR training and access infrastructure are crucial, as lack of familiarity with clinical systems has been shown to negatively impact learning and increase burnout among trainees (14).

The lack of functional supervision during EHR use, reported by 96% of students, is troubling. Supervisory oversight is necessary to ensure ethical data use, provide real-time feedback, and model professional behavior in digital environments (15). The absence of such mentorship may diminish educational outcomes and pose medico-legal risks.

Given that digital health literacy is now recognized as a core competency, these findings urge policy makers and educators to prioritize full EHR integration into undergraduate medical education. Structured credentialing processes, clear access protocols, supervision frameworks, and equitable IT infrastructure should be implemented nationwide. Future interventions could include EHR simulation platforms, standardized training modules, and inter-institutional policy harmonization, as proposed in U.S. and European models (15).

5. CONCLUSION

The implementation of EHR access for medical students in Jordan is lacking in some areas, according to our study. We need to make sure our institutions and infrastructures meet international standards so that we can improve medical education. The reform we are tasked with is a multi-level one, it involves the university, the teaching hospital and the national health authorities, so that EHR engagement can be done safely, under supervision and meaningfully.

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Declarations:
Abbreviations:
EHR: Electronic Health Records
IRB: Institutional Review Board
SPSS: Statistical Package for the Social Sciences
IBM: International Business Machines
NY: New York

Ethical approval and informed consent to participate: Ethical approval for this study was waived according to the policy of Al-Balqa Applied University. The study was conducted in accordance with the principles of the Declaration of Helsinki. Participation was voluntary, and informed consent was obtained from all participants prior to data collection.

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