

ORIGINAL ARTICLE

Electronic Health Record Usability and Its Association With Documentation Burden and Clinician Burnout

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ABSTRACT

Background: Electronic Health Record (EHR) systems are a crucial part of the healthcare landscape in the modern era, fostering better access to patient information and facilitating clinical decision-making. The purpose of this study was to explore the usability of EHRs and its relationship with documentation burden and clinician burnout. **Methods:** This cross-sectional study (n=250) included health professionals (physicians, residents, and nurses) as study participants via a filled structured, self-administered questionnaire covering the following domains: Demographic characteristics, EHR use, usability of EHRs, documentation burden, and clinician burnout (IBM SPSS Statistics 26.0, p value < 0.05 as significant). **Results:** Clinical experience among the participants was 9.1 ± 6.4 years and their mean age was 36.2 ± 8.1 years. 48.4% of participants reported being moderately satisfied with EHR usability, 44.0% moderately burdened with documentation, and 43.2% moderately burned out. Clinician burnout was significantly associated with profession, clinical experience, daily use of EHRs, formal training in EHRs, and technical problems, with a p value < 0.05. Increased clinician burnout was strongly associated with decreased EHR usability ($\chi^2 = 29.84$, p < 0.001) and increased documentation burden ($\chi^2 = 26.91$, p < 0.001). **Conclusions:** Usability of EHRs and burden of documentation were significantly linked to clinician burnout. Enhancing the usability of EHRs, reducing documentation workload, and improving user training and technical support could positively impact clinician well-being and healthcare outcomes.

Keywords: Electronic Health Records; EHR Usability; Documentation Burden; Clinician Burnout; Healthcare Professionals.

INTRODUCTION

The adoption of Electronic Health Records (EHRs) has revolutionized healthcare delivery by replacing paper-based records with electronic systems that support managing patient information, streamline communication among healthcare providers, and enable better continuity and quality of care ¹. The widespread use of EHRs has led to improved access to patient information, better clinical decision-making and greater efficiency in healthcare organizations ². However, usability issues have been raised about EHR systems, and their potential unintended consequences on clinicians' workflow, especially in the area of documentation and work-related quality of life ³. EHRs can be beneficial for healthcare providers (HCPs) in terms of information access and patient safety; they may have negative impacts on HCPs due to the design of the systems and excessive documentation requirements ⁴. Usability of EHRs is defined as the ability of healthcare practitioners to use electronic record systems to achieve clinical goals efficiently, effectively, and satisfactorily ⁵. Poor usability leads to increased navigation, re-entry, and cognitive load, which can cause workflow disruptions and lower productivity ⁶. Meanwhile, documentation burden has been an increasing issue, with clinicians increasingly spending significant time documenting electronically, which can sometimes be at the cost of face-to-face interaction with patients ⁷.

Documentation workload has been found to negatively affect job satisfaction, productivity, and stress levels among physicians, nurses, and other health care workers ⁸. In addition, technical issues and insufficient training of users can reduce the usability of EHRs and potentially have a negative impact on clinical outcomes ⁹. Burnout is a syndrome of emotional exhaustion, depersonalization, and lack of sense of professional accomplishment that is caused by long-term occupational stress. With its negative effects on mental health, levels of satisfaction, retention within the healthcare workforce, and quality and safety of patient care, burnout has emerged as a major public health issue ¹⁰. New data indicate that using digital administrative workflows, especially the documentation of EHRs, are significant drivers of clinician burnout for many healthcare organizations. Previous studies have all found that burnout among healthcare professionals is related to lower usability of the EHR, longer documentation time, and more administrative burden ^{11,12}.

The association between EHR usability and clinician burnout has been increasingly investigated in high-income countries, but there is a lack of evidence in developing health care systems, where variations in infrastructure, staffing, technical support, and the implementation of digital health could affect clinicians' experiences with EHRs. These relationships must be understood and applied to designing interventions that make EHRs the most effective system, minimize documentation demands, and enhance employee health. Hence, the present study focused on the

usability of EHRs and the association between usability and documentation burden or clinician burnout in healthcare professionals within a tertiary care teaching hospital.

METHODOLOGY

The study was a cross-sectional study carried out among healthcare professionals in the Tertiary Care Sheikh Zayed Teaching Hospital, Lahore for a period of six months from February to July 2022. The purpose of this study was to assess the usability of the Electronic Health Record (EHR) system and to understand its relationship with increased documentation burden and clinician burnout. A consecutive sampling technique was used, and the sample size was calculated using the formula $n = Z^2 P(1-P)/e^2$, to recruit a total of 250 healthcare professionals. Physicians, resident doctors, and registered nurses who used the hospital's electronic health record system on a routine basis for at least six months prior to the study were eligible to participate. Healthcare professionals on extended leave during the study period, as well as those with administrative duties who have no regular documentation of EHRs, interns, students, and those who refused to take part in the study or did not answer the questionnaires fully, were excluded.

A structured, self-administered questionnaire was used to gather data and comprised four sections. Demographic and professional characteristics of the participants were described in the first section: age, gender, profession (physician, resident, nurse), clinical experience (number of years), and clinical department (Medicine, Surgery, Pediatrics, Emergency, or other departments). The second section evaluated EHR utilization characteristics, such as average number of patient records documented per day (<15, 15–25, or >25), receipt of formal EHR training (yes/no), and frequent technical issues (yes/no) while using the EHR. The third portion of the survey focused on the three main study variables: Electronic Health Record (EHR) usability, documentation burden, and clinician burnout. The usability of EHR was assessed by a structured questionnaire that assessed participants' perception of the overall usability of the EHR system. Documentation burden was evaluated by measuring participants' perceived workload of electronic clinical documentation. A standardized questionnaire of burnout was used to assess clinician burnout. Using the pre-established scoring criteria, participants were placed in one of three groups: low, moderate, and high scores, based on their overall score from each of the questionnaires: EHR Usability, EHR Documentation Burden, and Clinician Burnout. The variables were then analyzed statistically, both descriptively and inferentially, using the categories.

The data entry of the completed questionnaires was checked for completeness. Data were analyzed statistically using IBM SPSS Statistics version 26.0 (Armonk, NY: IBM Corp). Continuous variables such as age and years of clinical experience were summarized as mean ± standard deviation (SD), and categorical variables were expressed as frequency (n) and percentage (%), respectively. The relationship between participant characteristics and high clinician burnout was examined by using Pearson's Chi-square (χ^2) test, as was the relationship between EHR usability, documentation burden, and high clinician burnout. All analyses were performed where a p-value <0.05 was considered statistically significant. Head approval was obtained from the Institutional (Sheikh Zayed Hospital Lahore) prior to study.

RESULTS

A total of 250 healthcare professionals participated in this study. The mean age of the participants was 36.2 ± 8.1 years, and the mean number of years of clinical experience was 9.1 ± 6.4 years. There were more females than males (52.8% to 47.2%). The top three professions were physicians 90 (36.0%), nurses 85 (34.0%) and residents 75 (30.0%). The majority of the participants were from the Medicine department (32.8%), and the rest were from Surgery, Pediatrics, Emergency, and other clinical departments. The baseline demographic and professional characteristics of the healthcare professionals are summarized in Table I.

Table I: Baseline Demographic and Professional Characteristics of the Participants (n = 250)

Variable	Frequency (n)	Percentage (%)
Age (years), Mean ± SD	36.2 ± 8.1	—
Male	118	47.2
Female	132	52.8
Profession		
Physicians	90	36.0
Residents	75	30.0
Nurses	85	34.0
Clinical experience (years), Mean ± SD	9.1 ± 6.4	—
Department		
Medicine	82	32.8
Surgery	58	23.2
Pediatrics	43	17.2
Emergency	37	14.8
Other departments	30	12.0

Table II shows participants' characteristics related to EHR use. Almost half of the healthcare professionals 108 (43.2%) used the EHR for 4-6 hours daily and 96 (38.4%) for >6 hours daily. Nearly half 124 (49.6%) recorded 15-25 patients' records a day. 171 (68.4%) had received formal EHR training while 79 (31.6%) had not received any formal training. 104 (41.6%) of respondents reported regular problems with the EHR.

Table II: Electronic Health Record Utilization Characteristics (n = 250)

Variable	Frequency (n)	Percentage (%)
Daily EHR use <4 hours	46	18.4
Daily EHR use 4–6 hours	108	43.2
Daily EHR use >6 hours	96	38.4
Documents <15 patient records/day	52	20.8
Documents 15–25 patient records/day	124	49.6
Documents >25 patient records/day	74	29.6
Formal EHR training (Yes)	171	68.4
Formal EHR training (No)	79	31.6
Frequent technical issues (Yes)	104	41.6
Frequent technical issues (No)	146	58.4

Table III shows the distribution of EHR usability, documentation burden, and clinician burnout levels among the participants. Nearly half of the participants 121 (48.4%) said the usability of the EHR was moderate, and 67 (26.8%) said the EHR had low usability. 110 (44.0%) rated documentation as moderate and 83 (33.2%) rated it as high. In terms of clinician burnout, 108 (43.2%) had moderate burnout, and 74 (29.6%) had high burnout, meaning a significant number of healthcare workers were subjected to significant occupational stress.

Table III: Distribution of EHR Usability, Documentation Burden, and Clinician Burnout Levels (n = 250)

Variable	Category	Frequency (n)	Percentage (%)
EHR Usability	High	62	24.8
	Moderate	121	48.4
	Low	67	26.8
Documentation Burden	Low	57	22.8
	Moderate	110	44.0
	High	83	33.2
Clinician Burnout	Low	68	27.2
	Moderate	108	43.2
	High	74	29.6

The results of Pearson's Chi-square test for the association between participant characteristics and high clinician burnout are presented in **Table IV**. Profession ($\chi^2 = 10.18$, $p = 0.006$), clinical experience ($\chi^2 = 7.82$, $p = 0.020$), daily EHR use ($\chi^2 = 15.94$, $p < 0.001$), formal EHR training ($\chi^2 = 5.17$, $p = 0.023$), and frequent technical issues ($\chi^2 = 14.28$, $p < 0.001$) were significantly associated with high clinician burnout. However, there was no statistically significant difference between gender and department with respect to burnout ($p > 0.05$).

Table IV: Association Between Participant Characteristics and High Clinician Burnout (n = 250)

Variable	Test	Statistic	p-value
Gender	Chi-square	1.24	0.266
Profession		10.18	0.006
Department		5.43	0.246
Clinical experience		7.82	0.020
Daily EHR use		15.94	<0.001
Formal EHR training		5.17	0.023
Technical issues		14.28	<0.001

Table V shows that EHR usability and documentation burden are associated with high clinician burnout. The association between low EHR usability and high burnout is statistically significant ($\chi^2 = 29.84$, $p < 0.001$) and had the highest prevalence at 37 (55.2%) compared to moderate 28 (23.1%) and high 9 (14.5%) EHR usability. Likewise, the highest proportion of high documentation burden participants had high burnout 41 (49.4%), while moderate documentation burden participants had moderate burnout 25 (22.7%) and low documentation burden had low burnout 8 (14.0%) ($\chi^2 = 26.91$, $p < 0.001$).

Table V: Association of EHR Usability and Documentation Burden With High Clinician Burnout (n = 250)

Variable	High Burnout n (%)	Chi-square	p-value
EHR Usability		29.84	<0.001
High	9 (14.5)		
Moderate	28 (23.1)		
Low	37 (55.2)		
Documentation Burden		26.91	<0.001
Low	8 (14.0)		
Moderate	25 (22.7)		
High	41 (49.4)		

The results suggest that EHR usability and documentation load are strongly correlated with increased clinician burnout. High burnout was also associated with profession, clinical experience, daily EHR use, formal EHR training, and frequent technical issues. These findings highlight the importance of improving EHR usability and reducing documentation burden to address clinician burnout.

DISCUSSION

This study assessed the relationship between the usability of the Electronic Health Record (EHR), documentation burden, and clinician burnout among those who use the EHR in a tertiary care teaching hospital. The results showed that the majority of respondents had moderate usability of EHRs, and about one-third had high documentation burden and high clinician burnout. In addition, high burnout levels were significantly correlated with profession, clinical experience, frequent use of EHRs, formal EHR training, and frequent technical problems. Perhaps most importantly, reduced usability of EHRs and greater documentation burden were strongly correlated with clinician burnout, demonstrating the importance of digital workflow on the well-being of the clinician. Previous research has also found that higher documentation requirements and poor usability of EHRs are significant factors affecting clinician stress, job satisfaction, and burnout in different health care contexts ^{13,14}.

The link between EHR usability and clinician burnout is similar to what has been reported previously ¹⁵. Other previous multicenter research has shown that a more usable EHR system is associated with significantly less burnout among clinicians, indicating that system design that cuts down on cognitive load and streamlines workflows can reduce clinician burnout ¹⁶. A large national study also found that dissatisfaction with health information technology is an independent predictor of clinician burnout, while another study found job satisfaction and lower emotional exhaustion among users of more intuitive EHR systems ¹⁷. The current results are consistent with these other observations, as those reporting low EHR usability had significantly higher levels of burnout.

Another factor that was found to be significant in the present study with regard to burnout was documentation burden. Clinician burnout was significantly greater among participants who described a high documentation burden as compared to those who described a low documentation burden. Indeed, prior studies have found that excessive documentation demands take up time that could otherwise be used with the patient, and that administrative documentation is one of the major contributors to occupational stress among healthcare professionals despite the widespread adoption of EHRs, and that health care professionals often spend extra time outside of their usual clinical hours completing all of these electronic

documentation activities, causing a work-life imbalance and emotional exhaustion^{18,19}. In addition, a systematic review of the literature recently found that documentation burden with EHRs is consistently linked to burnout for a number of medical specialties. These results support the need for minimizing superfluous documentation demands to benefit clinician well-being²⁰.

There are a few limitations to this study. First, because of its cross-sectional nature it is difficult to make causal conclusions about the relationship between the usability of the EHR, documentation burden, and clinician burnout. Secondly, the study was carried out at a single tertiary care hospital and this might restrict the generalizability of the results. Lastly, survey-based tools may have resulted in a reporting bias. Further multicenter, longitudinal studies that include objective measures of EHR use and assess interventions to enhance EHR usability and decrease documentation burden are recommended to advance evidence.

CONCLUSION

The current study showed that both decreased Electronic Health Record (EHR) usability and increased documentation burden were significant factors in greater clinician burnout among health care professionals. Other factors that were found to play significant roles in EHR-related burnout were profession, clinical experience, frequent use of the EHR, formal EHR training, and frequent technical problems. The results highlight the need to enhance the usability of EHR systems by designing them with user-centered approaches, providing thorough training, ensuring prompt technical assistance, and reducing the burden of unnecessary documentation. These strategies can have a positive impact on clinician well-being, increase the efficiency of clinical work, and ultimately improve the health of the clinical encounter.

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