The Relationship Between Usage of Electronic Health Record (HER) and The Work, Personal Burnout Among Healthcare Providers, KSA

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Background: The Saudi Ministry of Health has invested significant resources in implementing an electronic health record (EHR) system to fully automate hospitals and provide coordinated care delivery. Electronic health records (EHRs) are essential tools for accurate and efficient patient record management. However, the usage of EHRs can cause tremendous load and fatigue for healthcare providers, thereby impacting the quality of treatment they give.
The study aims to assess burnout among healthcare personnel using electronic health records (EHRs) in Saudi Arabian hospitals and identify critical factors contributing to burnout. **Methods:**descriptive quantitative cross- sectional study was conducted. A valid and reliable questionnaire was distributed to healthcare providers in Saudi Arabian hospitals to measure their burnout levels associated with EHR usage. Data was collected via convenience sampling in three government hospitals over a seven month period. A standardized EHR system efficacy assessment was administered to primary health care practitioners (specialists, medical officers, and nurses) throughout medical education programs.Data was analyzed using partial least squares-structural equation modeling for hypothesis testing.
Results: The study found that using electronic health records (EHRs) can lead to burnout among healthcare providers, potentially compromising patient care quality. Several characteristics, including living location, age, job, and year of experience, were found to be strongly connected to personal burnout among healthcare professionals. However, only age had a significant impact on work-related burnout. Working hours and patient volume have a considerable impact on EHR-related burnout among healthcare providers.
Conclusion: Organizational leaders and researchers should examine EMR use as a risk factor for HCP burnout.As EMRs become more prevalent in clinical settings, practitioners must trust that they are a valuable tool rather than a nuisance to be used ineffectively.Effective interventions are required to address time spent on EMRs, design, and organizational support for clinicians and staff.

Introduction :

Electronic medical records (EMRs) play a crucial role in storing, accessing, and managing health data, consequently impacting patient care globally. Implementing electronic medical records (EMRs) can significantly effect care delivery and the well-being of healthcare practitioners (HCPs), as these tools are always improving. Previously, healthcare companies used paper-based records to retain patient data. Recently, electronic health records (EHRs) have gained popularity and widespread adoption. According to the Healthcare Information and Management Systems Society, an EHR is an electronic record of patient health information created during one or more interactions in any medical environment. EHRs are critical for guaranteeing continuity of patient care [1]. EHRs improve healthcare quality by boosting efficiency, minimizing prescription mistakes, and promoting adherence to recommendations [3, 4]. The Joint Commission International identified misunderstanding as the leading cause of sentinel events. EHRs improve

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communication and promote safe and efficient patient care in healthcare companies in the US [5].

Tajirian and Stergiopoulos [6] showed that employing EHRs does not improve patient care quality by providing quick access to health information or supporting clinical decision-making. Despite low satisfaction with EHRs, switching to paper-based records is not an option, hence improving EHR systems is the most suggested course of action [6]. One key disadvantage of EHRs is healthcare professionals' unwillingness to use them, which is typically due to insufficient training or a lack of other incentives. Healthcare providers who lack sufficient direction on EHR

utilization may develop burnout, a growing issue [7]. According to Soares and Chan [8] and Micek and Arndt [7], healthcare practitioner burnout can have a negative impact on the quality of healthcare services by increasing medical errors and decreasing patient care and satisfaction.

Burnout is a phenomenon marked by emotional weariness, depersonalization, and a low sense of personal success that is predominantly caused by working pressures [9]. According to studies, burnout among healthcare providers has a negative impact on the healthcare system [10].

One key disadvantage of EHRs is that healthcare providers are often unprepared to use them, either to insufficient training or a lack of other incentives. Lack of advice on EHR utilization can lead to burnout among healthcare providers, a growing issue [7]. Burnout is an occupational stress syndrome caused by job-related stress. Various burnout indices have been established to assess physician burnout, including the Mini Z survey, Maslach Burnout Inventory (MBI), Mayo Well Being Index, and Shirom-Melamed Burnout Measure (SMBM). The Mini Z survey consists of 10 items that examine three outcomes (stress, burnout, and satisfaction) and seven burnout drivers (job control). One key disadvantage of EHRs is that healthcare providers are often unprepared to use them, either to insufficient training or a lack of other incentives. Lack of advice on EHR utilization can lead to burnout among healthcare providers, a growing issue [7]. According to Soares and Chan [8] and Micek and Arndt [7], healthcare practitioner burnout can have a negative impact on the quality of healthcare services by increasing medical errors and decreasing patient care and satisfaction.

Burnout is a phenomenon marked by emotional weariness, depersonalization, and a low sense of personal success that is predominantly caused by working pressures [9]. According to studies, burnout among healthcare providers has a negative impact on the healthcare system [10]. With quality improvement initiatives and the COVID-19 pandemic requiring large-scale data collection, it's important to investigate the relationship between EMRs and HCP burnout to improve healthcare worker well-being and patient outcomes. This study aims to conduct a scoping assessment of literature on EMR-related burnout among healthcare professionals. The goal is to (1) identify EMR- related problems that contribute to HCP burnout and (2) develop strategies to alleviate these issues. Our paper aims to evaluate interventions and organizational supports that have been introduced to alleviate EMR-related HCP burnout. It is not limited by publication year or region, unlike previous studies on the topic (8, 9). Identifying characteristics that lead to EHR-related fatigue, such as documentation structure and EHR usage time, is critical [6]. For example, lowering EHR usage time by using dropdown lists instead of manual input can be advantageous. The goal of this study is to assess the extent of burnout among Saudi healthcare workers by looking at EHR-related burnout levels and identifying significant factors that contribute to burnout. Addressing these variables is critical for closing the knowledge gap and effectively combating burnout at its source. This article is intended to give a complete investigation of EHR-related burnout among Saudi healthcare providers.

Methods:

Study Design and Setting: This cross-sectional study included all healthcare professionals in Saudi Arabia who use EHRs. The field survey collected data from three MOH hospitals (a) with over 500 patient beds and (b) using fully integrated EHR systems.

study subject: The study included a wide range of healthcare providers, including physicians, nurses, and allied health professionals. Participants were chosen using the snowball sampling method in a simple manner, ensuring that only EHR users were included in the study.

Tools

Two tools were utilized to conduct this research:

-**The Maslach Burnout Inventory (MBI) (Maslach et al., 1997)** is a reliable and valid tool for identifying and assessing burnout in service professionals. This psychological assessment questionnaire has 22 symptom items for occupational burnout. MBI assesses three subscales of burnout: emotional exhaustion (EE) (9 items), depersonalization (5 items), and personal accomplishment (8 items). Respondents rank things on a scale of 0 to 6, as follows: There are six categories: never, a few times a year, once a month, once a week, a few times a week, and every day. The results showed high scores on the first two scales and low scores on the burnout subscale. EE subscale is classified as High (≥ 27), Moderate (19-26), and Low (0-18). The DP subscale is divided into three categories: high (≥ 10), moderate (6-9) and low (0-5). PA is classified as high (0-33), moderate (34-39), and low. According to another Egyptian study (Abdo et al., 2016), burnout levels range from 1-33 (low), 34-66 (average), to 67-99.9 (high). EHR Data Delineation

EHR data delineation tool : it starts with a description of its characteristics. Data characteristics should include the EHR platform and version used, as well as whether the data is disease-specific (e.g., cancer, neurology) or generic. The goal of data collecting (e.g., routine clinical care, research network) and the provenance of critical data pieces

(e.g., healthcare professionals, administrative staff) should also be addressed. Provide a description of the clinical settings where EHR data were gathered, including type (e.g., primary care, hospitals, emergency departments, home) and provider type (e.g., specialists, primary care physicians).

Data collection:

Convenience sampling was used to collect data due to the hectic schedules of specialists and medical officers in the bustling hospital environment, which limited the use of random sample. After approval from the Medical Research and Ethics Committee (MREC), the survey questionnaire was distributed to target samples during continuing medical education (CME) programs for specialists, medical officers, and assistant medical officers, as well as continuing nursing education (CNE) programs for nurses at various government hospitals implementing EHR systems with similar clinical functionalities.

Statistical Analysis: Data analysis was conducted using the Statis tical Package for Social Sciences [27] version 27. A P-value of less than 0.05 was considered statistically significant. Descriptive statistics were used to summarize the data, with means and standard deviations for the outcome variables (total personal burnout score, total work-related burnout score, and total EHR-related burnout score) and frequencies and percentages for the independent variables. Normality tests using skewness and kurtosis criteria indicated that the outcome variables were normally distributed [28]. Bivariate analyses, including Analysis of Variance (ANOVA) and independent samples T-tests, were conducted to identify the variables influencing healthcare providers' burnout.

Results:

A descriptive analysis in SPSS was conducted on 888 valid replies from 1200 dispersed questionnaires, representing a 74% response rate. Table 1 shows the profile of respondents. The examined institutions had a higher proportion of female nurses, specialists, and medical officers, resulting in an unbalanced representation of male (29%) and female (71%) care professionals. Due to a shortage of doctors and specialists in MOH hospitals, there was an unbalanced number of respondents (44%), making it difficult to select a sample quota for convenience sampling, despite the confidentiality of population information [46].

the majority of responders (64%) were between the ages of 25 and 35 and worked as nurses or junior medical officers. Over 50% of respondents were nurses (44%) and assistant medical officers (11%) with diploma qualifications (53%), while 37% were medical officers with bachelor's or specialty degrees (8%), master's degrees (7%), and doctorates (1%). The majority (53%) had less than 5 years of practice and less than 3 years of experience using EHR systems.

Table 1 a shows the study participants' particular work-related characteristics. Most respondents (77.6%) worked full-time. The majority of healthcare practitioners worked 32 to 41 hours per week (36.8%), followed by those who worked 42 to 51 hours per week (33.5%). More than a third of respondents had 2-5 years of experience (33.5%), whereas a smaller fraction had 11-15 years of experience (12.0%). Many respondents saw 11 to 20 patients each week (20.9%), closely followed by those who saw ten or fewer patients (19.1%). The majority of healthcare practitioners reported spending 10 minutes or less per patient (32.0%, n=149), followed by those who spent 11-20 minutes per patient (31.6%).

Table 1 Personal and work-related information of study participants.

Variable		Frequency (%)
Working hours per week		
	≤31 h/wk	89 (18.5)
	32–41 h/wk	181 (36.8)
	42–51 h/wk	166 (33.5)
	52–60 h/wk	55 (9.7)
	>60 h/wk	9 (1.5)
	1 year	95 (18.3)
	less 2–5 years	166 (33.5)
	6–10 years	121 (23.9)
Years of experience		

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	11–15 years	56 (12.0)
	More than 15 years	57 (12.3)
Minutes spent using EHR per patient?	10 min or less/patient	149 (32.0)
	11–20 min/patient	147 (31.6)
	21–50 min/patient	100 (21.5)
	More than 50 min/patient	39 (8.4)
	I don't know	30 (6.5)
No. patients per week	≤10 patients/week	89 (19.1)
	11–20 patients/week	97 (20.9)
	21–30 patients/week	87 (18.7)
	31–40 patients/week	76 (16.3)
	41–50 patients/week	46 (9.9)
	>51 patients/week	64 (13.8)
	Other	6 (1.3)

Figure 1 pointed that work related burnout were the highest domain followed by the HER related burnout, while personal related burnout were the least one
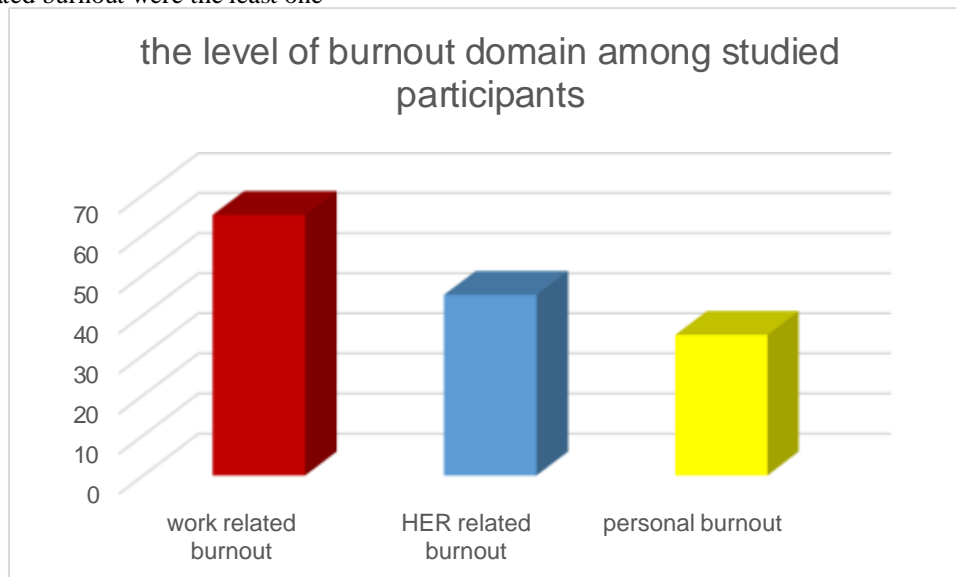

Figure 1the level of burnout domain among studied participants

Figure 2 showed that Several variables influenced personal burnout levels. Younger age groups had significantly greater personal burnout scores compared to older age groups (f = 6.826, P <0.001, Table 2). Physicians, nutritionists, and specialists had significantly higher personal burnout scores compared to other occupations (f =2.862, P <0.01, Table 2). Furthermore, respondents with 2-5 years of experience reported lower personal burnout scores than other experience categories (f =3.837, P =0.004, Table 3).

Here is the table summarizing the data:

Variable	Influence	F-value	P-value
Age Group	Younger age groups had significantly greater personal burnout scores compared to older age groups	6.826	<0.001
Occupation	Physicians, nutritionists, and specialists had significantly higher personal burnout scores compared to other occupations	2.862	<0.01
Years of Experience	Respondents with 2-5 years of experience reported lower personal burnout scores than other experience categories	3.837	0.004

Gender, marital status, nationality, employment status (full-time or part-time), working hours per week, number of patients per week, and minutes spent using EHR per patient all had no significant relationship with personal burnout scores. Age has a substantial impact on work-related burnout. Participants aged 51-60 years showed significantly lower mean work-related burnout levels compared to other age groups (f =2.934, P <0.05, Table 2).

Table 3: Mean and Standard deviation of burnout according to their socio-demographic data

Variable	Mean	SD
Gender: female	4.3	0.987
Male		
Marital Status: married	4.2	0.768
Not married		
Nationality: Saudia	4.35	0.658
Other nationality		
Employment Status: full time	4.21	0.456
Partial time		
Working Hours per Week: more than 36 hours	4.26	0.879
36-52 hours		

Discussion:

The study found that system quality is the most critical factor influencing the effective utilization of an EHR system. Compatible with the workflows of CPGs and physicians, an EHR system can provide patient care while also recording diagnosis results [26]. Using a user-friendly template for treatment notes simplifies data entry and allows doctors and nurses to focus on patient communication. A user-friendly CIS design promotes efficient use by automatically checking and filtering data, as well as providing timely access [38]. A system interface that displays individuals' complete medical histories can promote meaningful utilization [53].

This study examined the prevalence of burnout among healthcare providers utilizing EHRs in Saudi Arabian hospitals, with an emphasis on EHR-related burnout and associated factors. Our studies found three separate categories of burnout—personal, work-related, and EHR-related—and critical variables that influence each area. Living area, age, job type, and years of experience all had a substantial impact on personal burnout scores among healthcare practitioners.

Healthcare providers in central Saudi Arabia reported lesser personal burnout, probably due to improved EHR infrastructure in Riyadh hospitals. Individuals with 2-5 years of experience reported lower personal burnout compared to less experienced peers, contradicting prior studies that found no significant association between burnout and experience [7]. Healthcare disciplines, including physicians and dietitians, had higher personal burnout levels, consistent with prior study by Shanafelt and Dyrbye [29], indicating the demanding nature of these roles. Younger healthcare practitioners reported higher levels of personal and work-related burnout, possibly due to career-building pressures, compared to older doctors [30]. EHR-related burnout is a significant concern, however it appears to be less severe than work-related burnout based on average scores. The relatively high maximum score and mild skewness indicate that some individuals are still experiencing considerable EHR-related fatigue. Age did not significantly impact EHR-related burnout, supporting Micek and Arndt's [7] findings. Working more than 60 hours per week significantly increased EHR-related burnout, supporting Gardner and Cooper's [20] results that greater

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workload is associated with higher burnout levels. Similarly, healthcare providers managing a larger volume of patients reported increased EHR-related exhaustion, consistent with studies linking burnout to patient load and complexity [21]. This study is the first to quantify EHR-related burnout and identify factors affecting provider well-being, making it a unique contribution to the Saudi healthcare scene. Addressing these variables supports Saudi Vision 2030's goals of increasing healthcare providers' quality of life and patient care experiences by reducing burnout.

This study highlights the importance of organizations identifying and addressing the various aspects that contribute to HCP burnout, as each EMR system and organization is unique. Interventions should address these factors comprehensively. Addressing only one component of EMR-related burnout is insufficient for improving provider well-being. This study highlights the importance of developing novel EMRs to prevent burnout among healthcare professionals. To prevent EMR-related fatigue, healthcare organizations should involve HCPs in decision-making and prototyping.

Burnout among healthcare providers has far-reaching consequences for patient safety and care quality, in addition to personal health. Burnout is linked to higher medical errors and lower care standards, emphasizing the importance of early intervention and support interventions. Addressing these concerns swiftly is critical for patient outcomes and successful healthcare delivery. The study suggests targeted strategies to reduce healthcare professional burnout related to EHR use. Continuous training on EHR utilization is critical for healthcare providers to use systems properly and reduce irritation and errors. Second, introducing user friendly EHR design modifications, such as simplified documentation processes and customizable templates, can help minimize the time spent on EHR tasks.

References :

1. Waegemann C: Ehr vs. cpr vs. emr. Healthcare Informatics online 2003.
2. Salleh MIM, Abdullah R, Zakaria N: Electronic health records' system characteristics, use, andeffectiveness: A proposed theoretical framework. In Proceedings of The 24th International BusinessInformation Management Association Conference. Edited by Soliman KS. Milan, Italy: International Business Information Management Association (IBIMA); 2014:1669–1681.
3. ISO/TC: ISO/TR 20514:2005(E): Health Informatics-Electronic Health Record-Definition, Scope and Context. Switzerland; 2005.
4. Abdullah ZS: Hospital information systems implementation framework: Critical success factors for Malaysian public hospitals. Curtin University; 2013.
5. Salleh MI., Zakaria N, Abdullah R: The in□uence of system quality characteristics on health care providers' performance: Empirical evidence from Malaysia. Journal of Infection and Public Health 2016, 9:698–707.
6. Liebovitz D: Next steps for electronic health records to improve the diagnostic process. Diagnosis 2015, 2:111–116.
7. Yusof MM: A case study evaluation of a critical care information system adoption using the sociotechnical and it approach. International Journal of Medical Informatics 2015, 84:486–499.
8. Salahuddin L, Ismail Z, Hashim UR, Raja Ikram RR, Ismail NH, Mohayat MHN@: Sociotechnical factors influencing unsafe use of hospital information systems: A qualitative study in Malaysian government hospitals. Health Informatics Journal 2019, 25:1358–1372.
9. Ahmed EAS, Ahmad MN, Othman SH: Health Information System Critical Success Factors (HISCFs): A Systematic Literature Review. Journal of Information Systems Research and Innovation 2016,10:29–39.
10. Ahmadi H, Nilashi M, Shahmoradi L, Ibrahim O: Hospital Information System adoption: Expert perspectives on an adoption framework for Malaysian public hospitals. Computers in Human Behavior 2017, 67:161–189.
11. Mohamadali NA, Zahari NA: The Organization Factors as Barrier for Sustainable Health Information Systems (HIS) – A Review. Procedia Computer Science 2017, 124:354–361.
12. Salleh MIM, Abdullah R, Zakaria N: Extending Health Information System Evaluation with an Importance-Performance Map Analysis. In Advances in Health Management. Edited by Comity
13. Reˇsˇciˇc N, Alberts J, Altenburg TM, Chinapaw MJM, De Nigro A, Fenoglio D, Gjoreski M, Gradiˇsek A, Jurak G, Kiourtis A, Kyriazis D, Langheinrich M, Mancuso E, Mavrogiorgou A, Pechenizkiy M, Pratola R, Ribeiro J, Sori´c M, Taj F, Tammelin TH, Vastenburg M, Vilanova A, Vrijkotte TGM, SmartCHANGE M Luˇstrek. AI-based long-term health risk evaluation for driving behaviour change strategies in children and youth. In: International conference on applied mathematics & computer science (ICAMCS). Lefkada Island, Greece: IEEE; 2023. https://doi.org/10.1109/ICAMCS59110.2023.00020.[4]

14. Kiourtis A, Mavrogiorgou A, Mavrogiorgos K, Kyriazis D, Graziani A, Symvoulidis C, Bella G, Bocca S, Torelli F. Electronic health records at people's hands across europe: the InteropEHRate protocols. Stud Health Technol Inf 2022; 299(1):145–150DOI. https://doi.org/10.3233/SHTI220973.[5]

15. Collins SA, Bakken S, Vawdrey DK, Coiera E, Currie L. Clinician preferences for verbal communication compared to EHR documentation in the ICU. Appl Clin Inf 2011;2(2):190–201DOI. https://doi.org/10.4338/ACI-2011-02-RA-0011.[6]

16. Tajirian T, Stergiopoulos V, Strudwick G, Sequeira L, Sanches M, Kemp J, Ramamoorthi K, Zhang T, Jankowicz D. The influence of electronic health record use on physician burnout: cross-sectional survey. J Med Internet Res 2020;22(7): e19274DOI. https://doi.org/10.2196/19274.

17. Micek M, Arndt B, Tuan W, Trowbridge E, Dean S, Lochner J, Sampene E, Pandhi N. Physician burnout and timing of electronic health record use. Appl. Clin. Inform. Open access 2020;4(1):e1–8DOI. https://doi.org/10.1055/s-0039- 3401815.

18. Soares D, Chan L. Stress and wellbeing of junior doctors in Australia: a comparison with American doctors and population norms. BMC Med Educ 2016;16(1): 183–190DOI. https://doi.org/10.1186/s12909-016-0693-2.

19. Panagioti M, Panagopoulou E, Bower P, Lewith G, Kontopantelis E, Chew- Graham C, Dawson S, van Marwijk H, Geraghty K, Esmail A. Controlled interventions to reduce burnout in physicians: a systematic review and meta- analysis. JAMA Intern Med 2017;177(2):195–205DOI. https://doi.org/10.1001/ jamainternmed.2016.7674.

20. Domaney NM, Torous J, Greenberg WE. Exploring the association between electronic health record use and burnout among psychiatry residents and faculty: a pilot survey study. AcadPsychiatr 2018;42(5):648–652DOI. https://doi.org/ 10.1007/s40596-018-0939-x.

21. Maslach C, Leiter M. Understanding the burnout experience: recent research and its implications for psychiatry. World Psychiatr 2016;15(2):103–111DOI. https://doi. org/10.1002/wps.20311.

22. Chowdhury RA. Burnout and its organizational effects: a study on literature review. J Bus FinancAff 2018;7(4):1000353DOI. https://doi.org/10.4172/2167- 0234.1000353.

23. Jha A, Iliff A, Chaoui A, Defossez S, Bombaugh M, Miller Y. In: Massachusetts Medical Society MHaHA, Harvard TH, editors. A crisis in health care: a call to action on physician burnout. Chan school of public health, harvard global health institute; 2018.

24. Budd J. Burnout related to electronic health record use in primary care. J. Prim. Care Comm. Health 2023;14(1):1–7DOI. https://doi.org/10.1177/ 21501319231166921.

25. Feblowitz JC, Wright A, Singh H, Samal L, Sittig DF. Summarization of clinical information: a conceptual model. J Biomed Inf 2011;44(4):688–699DOI. https:// doi.org/10.1016/j.jbi.2011.03.008.

26. Pfaff M, Eris O, Weir C, Anganes A, Crotty T, Rahman M, Ward M, Nebeker J. Analysis of the cognitive demands of electronic health record use. J Biomed Inf 2021;113(1):103633DOI. https://doi.org/10.1016/j.jbi.2020.103633.

27. Poll TH. How doctors feel about electronic health records [cited 2024 24 Sep]; Available from: http://med.stanford.edu/content/dam/sm/ehr/documents/ EHR-Poll-Presentation.pdf; 2018.

28. Robertson S, Robinson M, Reid A. Electronic health record effects on work-life balance and burnout within the I3 population collaborative. J. Graduate Med. Edu. 2017;9(4):479–484DOI. https://doi.org/10.4300/JGME-D-16-00123.1

29. Gregory M, Russo E, Singh H. Electronic health record alert-related workload as a predictor of burnout in primary care providers. Appl Clin Inf 2017;8(3): 686–697DOI. https://doi.org/10.4338/ACI-2017-01-RA-0003.

30. Gardner R, Cooper E, Haskell J, Harris D, Poplau S, Kroth P, Linzer M. Physician stress and burnout: the impact of health information technology. J Am Med Inf Assoc 2018;26(2):106–114DOI. https://doi.org/10.1093/jamia/ocy145

31. Privitera M, Atallah F, Dowling F, Gomez-DiCesare C, Hengerer A, Arnhart K, Young A, Staz M. Physicians' electronic health records use at home, job satisfaction, job stress and burnout. J Hosp Adm 2018;7(4):52–59DOI. https://doi. org/10.5430/jha.v7n4p52.

32. Ca˜nadas-De la Fuente GA, Ortega E, Ramirez-Baena L, De la Fuente-Solana EI, Vargas C, G´omez-Urquiza JL. Gender, marital status, and children as risk factors for burnout in nurses: a meta-analytic study. Int J Environ Res Publ Health 2018;15 (10):2102DOI. https://doi.org/10.3390/ijerph15102102.

33. Dyrbye LN, Gordon J, O'Horo J, Belford SM, Wright M, Satele DV, West CP. Relationships between EHR-based audit log data and physician burnout and clinical practice process measures. Mayo Clin Proc

Mutaz Saud Maghrabi, Basem Mubark Alqurashi, Abdulmajeed Awwadh Alharthi, Ahmad Mohamed Ahmed Al-Dahri, Abdurrahman Ali Al Alyani, Mohammed Ibrahim Alfaqeeh, Saad Ghazi Albaqami, Hassan Hamed Jaman Alqurashi, Nawaf Eidhah Hassan Alharthi, Abdulgader Mosaed Alzahrani

2023;98(3):398–409DOI. https://doi.org/10.1016/j.mayocp.2022.10.027.Comrey AL, Lee HB. A first course in factor analysis. Hillsdale, NJ: Erlbaum; 1992.

34. Creedy DK, Sidebotham M, Gamble J, Pallant J, Fenwick J. Prevalence of burnout, depression, anxiety and stress in Australian midwives: a cross-sectional survey. BMC Pregnancy Childbirth 2017;17(1):13–20DOI. https://doi.org/10.1186/ s12884-016-1212-5.

35. Kristensen TS, Borritz M, Villadsen E, Christensen KB. The Copenhagen Burnout Inventory: a new tool for the assessment of burnout. Work Stress 2005;19(3): 192–207DOI. https://doi.org/10.1080/02678370500297720.

36. IBM Corp. IBM SPSS statistics for macintosh. Armonk, NY: IBM Corp; 2017.

37. Kim H. Statistical notes for clinical researchers: assessing normal distribution (2) using skewness and kurtosis. Restor. Denti. Endodo. 2013;38(1). https://doi.org/ 10.5395/rde.2013.38.1.52. 52–4.

38. Shanafelt T, Dyrbye L, Sinsky C, Hasan O, Satele D, Sloan J, West C. Relationship between clerical burden and characteristics of the electronic environment with physician burnout and professional satisfaction. Mayo Clin Proc 2016;91(7): 836–848DOI. https://doi.org/10.1016/j.mayocp.2016.05.007.

39. Hilliard R, Haskell J, Gardner R. Are specific elements of electronic health record use associated with clinician burnout more than others? J Am Med Inf Assoc 2020; 27(9):1401–1410DOI. https://doi.org/10.1093/jamia/ocaa092.

40. Zumbrunn B, Stalder O, Limacher A, et al. The well-being Of Swiss general internal medicine residents. Swiss Med Wkly 2020;150:w20255.

41. Corby S, Ash JS, Mohan V, et al. A qualitative study of provider burnout: do medical scribes hinder or help? JAMIA Open 2021;4:1–8.

42. Rhoades L, Eisenberger R. Perceived organizational support: a review of the literature. J Appl Psychol 2002;87:698–714.

43. West CP, Dyrbye LN, Erwin PJ, et al. Interventions to prevent and reduce physician burnout: a systematic review and meta-analysis. Lancet 2016;388:2272–81.

44. O'Malley AS, Grossman JM, Cohen GR, et al. Are electronic medical records helpful for care coordination? Experiences of physician practices. J Gen Intern Med 2010;25:177–85.

45. Mann CJ. Observational research methods. Research design II: cohort, cross sectional, and case-control studies. Emerg Med J 2003;20:54–60.