

The Experience and Satisfaction of Physicians with Electronic Health Systems in Healthcare Establishments in Jazan, Saudi Arabia

Ibrahim M Gosadi¹, Atheer A AlTalhi², Amal J Alfaifi³, Rola A Khmees⁴, Norah M Qassadi⁴

¹Department of Family and Community Medicine, Faculty of Medicine, Jazan University, Jazan, Saudi Arabia; ²Department of Otorhinolaryngology, Dr.Soliman Fakeeh Hospital, Jeddah, Saudi Arabia; ³Department of Family Medicine, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia; ⁴Faculty of Medicine, Jazan University, Jazan, Saudi Arabia

Correspondence: Ibrahim M Gosadi, Faculty of Medicine, Jazan University, P.O. Box: 2349, Jazan, 82621, Saudi Arabia, Tel +966 562137711, Email gossady@hotmail.com

Purpose: The Saudi Ministry of Health's electronic health (e-health) initiative aims to promote the higher use of electronic medical records and has established multiple health applications to facilitate access to healthcare. The current investigation measured the satisfaction and experience of physicians concerning e-health systems and identified the factors associated with their satisfaction level.

Methods: This study was a cross-sectional investigation targeting physicians working in primary healthcare centers and hospitals in the Jazan region of Saudi Arabia. Data were collected via a self-administered questionnaire between July and September 2022, which was distributed via online platforms. The questionnaire included sections measuring the physicians' demographic data and their experiences with e-health systems, including information technology (IT) support, training, software design, workload, physician and patient support, and data quality. Chi-square or Fisher's exact tests were used to assess associations between physicians' satisfaction levels and the measured demographics.

Results: A total of 445 physicians participated in the current investigation. The median age of the participants was 27, and more than half (58.4%) were male. The median level of the satisfaction score was 4 and varied between -30 (indicating the lowest satisfaction level) and 23 (indicating the highest satisfaction level). Employment rank and work settings were statistically associated with the level of satisfaction (P values < 0.05). The participating physicians were overall satisfied with the e-health systems' impact on their clinical workflow and ability to reduce their work hours but were less satisfied with the training required to use these systems.

Conclusion: A good overall satisfaction level with the established e-health systems in the Jazan region was detected. Senior physicians and physicians working in primary healthcare settings exhibited lower satisfaction levels, indicating a need for further investigations to identify the challenges of using e-health systems in these settings, especially among senior physicians.

Keywords: e-health, experience, satisfaction, physicians, Jazan, Saudi Arabia

Introduction

Advancements in Saudi Arabia's electronic infrastructure have contributed to the enhancement of digital literacy in the country. This is supported by the current focus of the Saudi Arabian government and its efforts to realize the Saudi Vision 2030 strategic framework via several transformation programs. Supporting digitization transformation is one of the primary aspects of the National Transformation Program.¹ This was reflected by the launch of several initiatives on the part of the Saudi Ministry of Health (MoH) to digitize its services, including access to healthcare services and electronic medical records systems.

In 2011, the Saudi MoH launched its strategy for e-health transformation, which included the development of new healthcare systems for hospital and primary care settings.² Since then, and supported by the digitization transformation of Saudi Vision 2030, multiple health applications have been established by the Saudi MoH to facilitate access to healthcare

and enhance communication between physicians and patients.³ Additionally, the e-health initiative promoted higher use of electronic medical records in hospital settings.⁴

Despite advancements in healthcare provision, which can be generated using e-health systems, several challenges have been reported that affect the optimum application of established e-health systems. Several international investigations have been performed to evaluate the experience and lessons learned after decades of establishing e-health systems. These challenges are related to the presence of multiple systems and fragmentation,⁵ limited interoperability,⁶ and some health establishments' inadequate access to e-health.⁷ Finally, e-health technology is continuously evolving, posing a challenge to health establishments in terms of investing in system updates.⁸

Studies assessing the use of e-health systems in Saudi Arabia suggest that healthcare professionals may experience difficulties and barriers to the optimum application of established e-health systems. A study conducted by Jabali and Jarrar,⁹ which investigated e-health records in seven hospitals in the Eastern Province of Saudi Arabia, indicated challenges impacting the adoption of systems in relation to data safety and security and the low use of services provided by electronic systems, such as medication allergy notifications and drug–drug interactions. In a more recent review, AlSadrah investigated the obstacles facing healthcare professionals and identified several factors, such as the negative attitudes of some healthcare professionals toward electronic systems, poor computer literacy, a lack of system customization, and poor support from information technology (IT) professionals.⁴ Most studies that assessed the use of electronic medical systems in Saudi Arabia have targeted medical records systems in hospital settings; therefore, research targeting the use of e-health systems in primary healthcare settings in Saudi Arabia is currently lacking.

The optimum use of e-health services can be influenced by several factors related to patients, healthcare providers, and healthcare infrastructure. Arguably, using e-health systems can vary according to different healthcare settings. Studies assessing the application of e-health services in the Jazan region of Saudi Arabia are limited to aspects concerning patients and indicate challenges regarding the use of these facilities.¹⁰ The current investigation aims to measure the satisfaction and experience of physicians working in primary healthcare settings and hospitals in the Jazan region with established e-health systems and identify factors associated with their satisfaction level.

Methodology

Study Context

This study reflects cross-sectional research that targeted physicians working in primary healthcare settings and hospitals in the Jazan region of Saudi Arabia. Data collection was performed using online platforms between July and September 2022. Physicians participated voluntarily and anonymously, and the study was performed in accordance with the Declaration of Helsinki. Ethical approval to conduct the study was granted by the Jazan Health Ethics Committee (approval number 2265 dated 02/20/2022).

Data Collection Tool

Data were collected via a self-administered questionnaire, which was developed after consulting the relevant literature measuring physicians' satisfaction with using e-health systems at national and regional levels.^{4,9,11} The questionnaire included sections measuring the physicians' demographic data and experiences with e-health systems, including IT support, training, software design, workload, physician and patient support, and data quality. The content of the questionnaire and its distribution according to domain are shown in Table 1. The questionnaire was reviewed by a panel of physicians working in primary healthcare and hospital settings with experience of utilizing e-health systems to appraise its content validity and comprehensiveness. Furthermore, the questionnaire was piloted using a sample of five male and five female physicians to assess its face validity, the clarity of the questions, and the time required to complete it. To assess the questionnaire's reliability, the internal consistency of the data collection tool was assessed via calculating a Cronbach's Alpha test, revealing a value of 0.8, which indicates an appropriate internal consistency level of the questionnaire items.

Data Collection Process

The questionnaire was converted into an electronic format to enable its desired distribution and recruitment of the target population. A web link was generated and distributed via social media groups that included physicians working in the

Table I The Domains and a List of Items Measuring Physicians' Satisfaction with Electronic Health Systems

Items
Information technology (IT) support
The information technology specialists respond to the feedback concerning health system improvement suggestions
The support of the information technology specialists when facing technical difficulties is satisfactory (eg a system crash or data access)
Training/computer skills
Training/orientation to use the electronic health systems was satisfactory
Computer literacy (eg fast typing) can affect the ability of physicians to use health systems*
Interface and system design
The interface design of electronic health systems are user friendly
The electronic health systems have competent data security features
Language barriers can affect the ability to use electronic health systems*
Workload
The electronic health systems enhance clinical workflow (eg laboratory and pharmacy requests)
The electronic health systems reduce work-related stress and burnout
Electronic health systems help save time
Using multiple/fragmented health systems is satisfactory
Physician support
Electronic health systems enable access to patient data from other departments/hospitals/ primary healthcare (PHC)
Electronic health systems enable remote access to patient data (from outside the healthcare establishment)
Electronic health systems provide assistance concerning updated clinical guidelines
Electronic health systems provide alerts concerning important patient allergies, drugs interactions, or incorrect medication entries
Electronic health systems may require entering the same patient data on more than one occasion*
Patient support
Using electronic health systems can disturb communication between the physician and the patient during history-taking and physical examination*
Electronic health systems facilitate patient referral to other healthcare establishments
Patients can remotely access their medical records, findings and reports
Electronic health systems enhance patient data confidentiality
Data quality
Health data quality and completeness are dependent on the physician entering the data*
In my healthcare facility, patient data are made available for research and development

Note: *Items indicating challenge or less satisfactory experience.

Jazan region. Physicians were also encouraged to share the web link with their colleagues to reach a larger target population. Physicians who worked in a Jazan primary healthcare center or hospital were recruited, and non-physicians or those who did not work in this region were excluded.

A convenient, non-random sampling technique was employed to achieve the required sample size. Sample size estimation was based on a similar study conducted by Alharthei et al,¹² which targeted physicians working in a government hospital in the Eastern Province of Saudi Arabia. Alharthei et al reported that 40% of the physicians involved were satisfied with the established electronic medical records system. Using the StatCal function of the Epi Info software, a prevalence of 40% was used to estimate the sample required for this investigation as a means to assess the satisfaction level. The established electronic medical system revealed a sample of 369 physicians, assuming a 5% margin of error and a 95% confidence interval level.

Data Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS, v.25). Binary and categorical variables were assessed using frequencies and proportions. Following the assessment of the distribution of measured continuous data and the detection of non-normal distribution, medians and the interquartile range (IQR) were used to summarize non-normally continuous data. Furthermore, means were used to summarize normally distributed data.

The assessment of physicians' experiences and satisfaction with e-health systems was performed using a Likert scale in which the answer options were "strongly disagree", "disagree", "neutral", "agree", "strongly agree", or "not applicable." To enable scoring the satisfaction levels, a score of -2 was given for "strongly disagree" answers, -1 for "disagree", 1 for "agree", 2 for "disagree", and 0 for "neutral" or "not applicable" answers. The scoring was reversed for items measuring a challenge or those that indicated a less satisfactory experience, as shown in Table 1. The scores were summed for each domain and as an overall total.

To assess the factors associated with satisfaction levels, continuous variables were grouped into binary items according to their means. Age was classified according to the median of 27, years of experience was reclassified based on a median of 2 years, and the number of patients was reclassified based on a median of 10 patients. Chi-square or Fisher's exact tests were used to assess the association between the physicians' satisfaction levels and measured demographics. A P-value less than 0.05 was accepted as indicating a statistically significant value for the applied test.

Results

A total of 445 physicians participated in the current investigation. The recruited number exceeded the estimated sample size due to the questionnaire web link being widely shared with the targeted population. The participants' demographic characteristics are shown in Table 2; their median age was 27, more than half of the sample was male (58.4%), and most

Table 2 The Demographic Characteristics of 445 Physicians from Jazan, Saudi Arabia

Age: median [IQR]	27 [26–32]
Gender: frequency [proportion]	
Male	260 [58.4%]
Female	185 [41.6%]
Nationality	
Saudi	363 [81.6%]
Non-Saudi	82 [18.4%]
Education level	
Bachelor	338 [76%]
High diploma	2 [0.4%]

(Continued)

Table 2 (Continued).

Masters	33 [7.4%]
PhD	10 [2.2%]
Board certificate	41 [9.2%]
Fellowship	21 [4.7%]
Current employment rank	
Intern	130 [29.2%]
Resident/ board trainee	206 [46.3%]
Senior registrar	64 [14.4%]
Consultant	38 [8.5%]
Other	7 [1.6%]
Current work setting	
Primary care	55 [12.4%]
Hospital	390 [87.6%]
Years of experience: median [IQR]	2 [1–6]
Average number of patients managed daily	10 [6–18]

were Saudis (81.6%). Additionally, most of the participants held a bachelor's degree (76%), were either residents or interns (75.5%), and worked in hospital settings (87%). The average number of years of experience was 2, and the average number of patients managed daily by each physician was 10.

Table 3 and Figure 1 summarize the physicians' responses to the questionnaire items. A satisfaction level analysis of each item indicated that the highest scores were related to the positive impact of e-health systems on enhancing clinical workflow, followed by its impact on reducing working hours; the lowest satisfaction levels concerned the quality of the data that could be influenced by the physician entering information, followed by satisfaction regarding physician training on the e-health systems. The median satisfaction level score was 4, and this ranged between –30 (indicating the lowest

Table 3 The Experience and Satisfaction of 445 Physicians in Jazan, Saudi Arabia, Concerning the Use of Electronic Health Systems

Item Frequency [Proportion]	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Applicable
IT support						
The IT specialists respond to the feedback concerning health system improvement suggestions	31 [7%]	64 [14.4%]	134 [30.1%]	147 [33%]	57 [12.8%]	12 [2.7%]
The support of the IT specialists when facing technical difficulties is satisfactory (such as system crash or data access)	25 [5.6%]	45 [10.1%]	160 [36%]	144 [32.4%]	68 [15.3%]	3 [0.7%]
Training / computer skills						
Training/orientation to use the electronic health systems was satisfactory	45 [10.1%]	62 [13.9%]	136 [30.6%]	129 [29%]	68 [15.3%]	5 [1.1%]

(Continued)

Table 3 (Continued).

Item Frequency [Proportion]	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Applicable
Computer literacy (such as fast typing) can affect the ability of physicians to use health systems	21 [4.7%]	35 [7.9%]	103 [23.1%]	185 [41.6%]	98 [22%]	3 [0.7%]
Interface and system design						
The interfaces design of electronic health systems are user friendly	24 [5.4%]	32 [7.2%]	174 [39.1%]	168 [37.8%]	46 [10.3%]	1 [0.2%]
The electronic health systems have competent data security features	17 [3.8%]	31 [7%]	170 [38.2%]	170 [38.2%]	50 [11.2%]	7 [1.6%]
Language barriers can affect the ability to use the electronic health systems	42 [9.4%]	74 [16.6%]	147 [33%]	109 [24.5%]	56 [12.6%]	6 [1.3%]
Work load						
The electronic health systems enhances clinical work flow (such as laboratory and pharmacy requests)	21 [4.7%]	27 [6.1%]	105 [23.6%]	179 [40.2%]	110 [24.7%]	3 [0.7%]
The electronic health systems reduces work's related stress and burnout	36 [8.1%]	72 [16.2%]	143 [32.1%]	117 [26.3%]	75 [16.9%]	2 [0.4%]
The electronic health systems are time saving	48 [10.8%]	52 [11.7%]	91 [20.4%]	128 [28.8%]	121 [27.2%]	5 [1.1%]
Having to use multiple/fragmented health systems is satisfactory	46 [10.3%]	68 [15.3%]	144 [32.4%]	133 [29.9%]	44 [9.9%]	10 [2.2%]
Physician support						
Electronic health systems enable access of patients' data from other departments/ Hospitals/PHCs	30 [6.7%]	47 [10.6%]	117 [26.3%]	170 [38.2%]	70 [15.7%]	11 [2.5%]
Electronic health systems enable remote access to patients' data (from outside the healthcare establishment) *	50 [11.2%]	57 [12.8%]	127 [28.5%]	110 [24.7%]	86 [19.3%]	14 [3.1%]
Electronic health systems provides assistance concerning updated clinical guidelines	44 [9.9%]	52 [11.7%]	159 [35.7%]	121 [27.2%]	58 [13%]	11 [2.5%]
Electronic health systems provides alerts concerning important patients' allergies, drugs interactions, or wrong medications entry	26 [5.8%]	36 [8.1%]	109 [24.5%]	161 [36.2%]	104 [23.4%]	9 [2%]
Electronic health systems may require entering same patient data in more than one occasion	28 [6.3%]	58 [13%]	147 [33%]	145 [32.6%]	58 [13%]	9 [2%]
Patient support						
Use of electronic health systems can disturb the communication between the physician and the patient during history taking and physical examination	42 [9.4%]	112 [25.2%]	123 [27.6%]	120 [27%]	43 [9.7%]	5 [1.1%]
Electronic health systems facilitate patients referral to other healthcare establishments	25 [5.6%]	45 [10.1%]	127 [28.5%]	157 [35.3%]	82 [18.4%]	9 [2%]
Patients can remotely access their medical records findings and reports	50 [11.2%]	73 [16.4%]	146 [32.8%]	122 [27.4%]	42 [9.4%]	12 [2.7%]

(Continued)

Table 3 (Continued).

Item Frequency [Proportion]	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Applicable
Electronic health system enhances patients data confidentiality	17 [3.8%]	42 [9.4%]	153 [34.4%]	149 [33.5%]	75 [16.9%]	9 [2%]
Data quality						
Health data quality and completeness are dependent on the physician entering the data	18 [4%]	20 [4.5%]	99 [22.2%]	195 [43.8%]	110 [24.7%]	3 [0.7%]
In my healthcare facility, patients data are made available for research and development	35 [7.9%]	44 [9.9%]	171 [38.4%]	131 [29.4%]	41 [9.2%]	23 [5.2%]

Note: *One missing case.

calculated satisfaction level) and 23 (indicating the highest calculated satisfaction level). The IQR of the satisfaction score ranged from -2 to 8. Visualization of the means of the satisfaction domains indicated that the e-health system had a positive impact on workload, and the software and IT support design were satisfactory; data quality and training scored the lowest levels of satisfaction compared with other domains.

Table 4 shows the association between satisfaction levels and the measured demographic characteristics. Employment rank was statistically associated with the level of satisfaction, where consultants exhibited lower satisfaction ratings compared with other categories (P value < 0.001). Furthermore, work settings were statistically associated with satisfaction levels, where workers in the primary healthcare sectors were less satisfied compared with those employed in hospital settings (P < 0.01). A marginal statistical significance was detected concerning the association between years of experience, where those with lower experience levels were less satisfied (P value = 0.057). A higher proportion of female physicians, Saudis, those younger than 27, and those who managed more than 10 patients showed lower satisfaction levels but without statistical significance (P value > 0.05).

Discussion

The current study represents cross-sectional research that targeted physicians working in healthcare settings in the Jazan region of Saudi Arabia to assess their experience and satisfaction with the e-health systems operational in their institutions. Most physicians were young male Saudis with bachelor's degrees who worked in hospital settings, had an average experience of 2 years, and managed an average of 10 patients daily. The participating physicians were overall



Figure 1 The satisfaction of 445 physicians from the Jazan region of Saudi Arabia concerning e-health systems according to specific domain.

Table 4 Assessment of Factors Associated with the Level of Satisfaction of 445 Physicians from Jazan, Saudi Arabia Concerning e-Health Systems

Satisfaction Levels				
	Lower Level	Higher Level	Total	P value
Gender				0.70*
Male	138 [53.1%]	122 [46.9%]	260 [100%]	
Female	102 [55.1%]	83 [44.9%]	185 [100%]	
Nationality				0.46*
Saudi	199 [54.8%]	164 [45.2%]	363 [100%]	
Non-Saudi	41 [50%]	41 [50%]	82 [100%]	
Current work setting				0.01*
Primary care	38 [69.1%]	17 [30.9%]	55 [100%]	
Hospital	202 [51.8%]	188 [48.2%]	390 [100%]	
Age				0.18*
27 or less	130 [57%]	98 [43%]	228 [100%]	
More than 27	110 [50.7%]	107 [49.3%]	217 [100%]	
Years of experience				0.057*
2 years or less	139 [58.2%]	100 [41.8%]	239 [100%]	
More than 2 years	101 [49%]	105 [51%]	206 [100%]	
Number of patients managed daily				0.29*
10 or less	134 [51.7%]	125 [48.3%]	259 [100%]	
More than 10	106 [57%]	80 [43%]	186 [100%]	
Employment rank				<0.001**
Intern	74 [56.9%]	56 [43.1%]	130 [100%]	
Resident/ Board trainee	115 [55.8%]	91 [44.2%]	206 [100%]	
Senior registrar	20 [31.3%]	44 [68.8%]	64 [100%]	
Consultant	30 [78.9%]	8 [21.1%]	38 [100%]	
Other	1 [14.3%]	6 [85.7%]	7 [100%]	

Note: *Chi-square test **Fisher's exact test.

satisfied with the impact of e-health systems on their clinical workflow and how it reduced their work hours; however, they were less satisfied with the training provided for using e-health systems and believed that variation in the use of e-health systems between physicians may influence the data quality entered in these systems. Factors associated with the satisfaction level included the type of healthcare setting, employment rank, and years of experience (marginal significance level).

The findings of the current investigation can be compared to similar local and international studies. A review by AlSadrah,⁴ which involved seven studies conducted in Saudi Arabia to measure healthcare workers' attitudes concerning electronic medical records, concluded that the main obstacle facing the appropriate use of these electronic medical records systems was some healthcare workers' negative attitudes toward them. Additionally, AlSadrah

indicated certain barriers to use, such as low computer literacy and a lack of training. Furthermore, Alharthi et al measured physicians' satisfaction with an electronic medical records system one year after its introduction in a government hospital in the Eastern Province of Saudi Arabia and concluded that only 40% were satisfied, with aspects such as speed, integration with workflow, and patient data being the main factors influencing satisfaction.¹² Although the current authors detected a generally positive satisfaction level concerning selected domains, suggesting a good attitude to established electronic healthcare systems, computer literacy and training were indicated as less satisfactory experiences among the recruited physicians. Nonetheless, studies cited in the review by AlSadrah and the study by Alharthi et al, which indicated lower satisfaction levels, were conducted nearly a decade ago, and a change of attitude toward the e-health systems in Saudi Arabia after a decade of implementation can be postulated.

The current investigation assessed seven main domains influencing physicians' satisfaction levels concerning e-health systems. The highest satisfaction level was detected concerning the positive influence of the e-health system on reducing physicians' workloads. However, the study by Shaker et al, which recruited a sample of 317 physicians from Makkah, Saudi Arabia, in 2009, indicated that 65% of the physicians believed that the use of electronic medical records systems disturbed their clinical workflow.¹³ The findings of Shaker et al contradict ours, which detected higher satisfaction levels concerning e-health systems impact on enhancing workflow. This variation can be explained by the difference in periods of conducting the studies and sample demographics, where the sample of Shaker et al included older physicians compared to the current investigation.

The present investigation's findings indicated the presence of higher satisfaction levels concerning the IT support and design of the e-health systems compared to other satisfaction domains. Nonetheless, our findings differ from El Mahalli's findings, who recruited 319 physicians to assess their satisfaction with electronic medical records systems in selected hospitals in the Eastern Province of Saudi Arabia. El Mahalli indicated that the e-health system was underutilized by the physicians, where a lack of IT support and customizability of the system to meet the users' needs in addition to technology complexity were major concerns reported by the physicians.¹⁴ Variations in satisfaction levels concerning the IT support, design, and interface of the e-health systems between different regions of Saudi Arabia may warrant a need for further investigation to assess variations between the design and IT support of different operational e-health systems in varying health establishments in the country.

Data quality scored the lowest level of satisfaction among the domains assessing physicians' satisfaction with the e-health systems in the current investigation. Our findings are similar to the findings by Alharthi et al, who recruited 115 physicians from the Eastern Province of Saudi Arabia and indicated low satisfaction levels concerning data quality of the established electronic medical records systems. Alharthi et al reported that among their sample of physicians, only 45% were satisfied with the completeness of patients' information, and only 64% believed that the information was accurate.¹² These findings represent a challenge concerning data quality and suggest a need for further assessment of factors influencing data quality. Nonetheless, it is possible to argue that the limited training the physicians receive concerning e-health systems can be associated with data quality.

A larger proportion of physicians in the current investigation were satisfied with how the established e-health system supported them. This finding is similar to the qualitative study by Al Alawi et al, who indicated that despite having difficulties with the initial system implementation, the physicians expressed satisfaction with the support of the electronic medical records system's various functions. Nonetheless, our findings indicated a very low satisfaction level among the physicians concerning the established e-health systems' patient support functions. This notion suggests the limited role of the established e-health systems in supporting patients. Earnest et al reported their findings of patients' and physicians' experiences concerning an online electronic medical records system that enabled patients to access their medical records online. Earnest et al indicated that giving patients access to their medical records online was beneficial for some patients and provided a positive experience for the physicians.¹⁵ Nonetheless, the benefits of providing patients access to their medical records can be limited if the language used in the e-health systems is different than the language used in the community, which can be the case in an Arabic-speaking country such as Saudi Arabia.

Studies that assessed the use of e-health systems among physicians in primary healthcare settings in Saudi Arabia remain limited. However, the current study's findings can be compared to similar qualitative investigations conducted in the United Arab Emirates that investigated physicians' use of electronic medical records systems in primary healthcare

settings, which indicated that system applications in primary healthcare settings reduced the occurrence of errors and saved time.¹¹ However, the present investigation compared satisfaction levels between healthcare workers in hospitals and primary care settings and indicated statistical differences, signifying that healthcare workers in primary healthcare settings were less satisfied compared to those working in hospital settings. This is a prospective topic for future in-depth investigations to highlight areas with lower satisfaction levels in primary care settings.

Comparing the current investigation's findings to international research indicated the presence of several similarities. A study conducted in Myanmar by Oo et al in 2020 measured information and communication technology literacy, as well as the adoption of electronic medical records systems among healthcare professionals in a tertiary hospital.¹⁶ The findings showed that among the 118 recruited healthcare professionals, a high level of literacy was indicated for only 20.3%. Oo et al emphasized the importance of providing training for healthcare workers to enhance their computer literacy and suggested the inclusion of electronic medical records system training in healthcare educational programs. Their findings are similar to the current study, where computer literacy and training were the primary domains influencing the satisfaction of physicians working with established e-health systems.

The current study indicated that physicians working in primary healthcare settings were less likely to be satisfied compared with physicians working in hospital settings. A study conducted in the United States, which involved 1386 physicians working in primary care settings, indicated that the presence of staff support when using e-health systems was one of the outcomes influencing overall satisfaction.¹⁷ This may partially (but not conclusively) explain the higher satisfaction level in hospital settings, ie, the presence of trainee interns and residents in hospital settings who can assist in managing e-health systems compared to primary care settings. Furthermore, the current study indicated that physicians with low experience levels were likely to exhibit less satisfaction, which could be explained by having received limited training regarding the use of these systems.

The current investigation's findings can help further explore the barriers and facilitators of using e-health systems among physicians, identify the levels of satisfaction among physicians in Jazan about electronic medical systems, and provide information to the relevant stakeholders to improve and enhance the use of these systems. This study found a low level of satisfaction in primary healthcare settings; however, further investigations are needed to explore the factors that can impact satisfaction among physicians working in primary healthcare in the Jazan region. Furthermore, the current study identified a lower satisfaction level among consultants in the region, which warrants further investigation to identify the challenges linked to using e-health systems among senior physicians.

Study Strengths and Limitations

This investigation has several strengths and limitations. The primary strength is related to the use of a comprehensive data collection tool, which was able to measure several domains influencing the satisfaction of physicians with established e-health systems. Another strength was the recruitment of physicians working in primary healthcare settings, which allowed for the assessment and comparison of satisfaction levels. The primary limitation is related to the recruitment method, which was reliant on using online settings, which may have limited the participation of some physicians who lacked access to social media. Another limitation concerns the generalizability of the findings because most of the participating physicians were young.

Conclusion

The current investigation identified a good overall satisfaction level with the established e-health system in the Jazan region. Physicians working in primary healthcare settings and consultants and physicians with less experience were likely to exhibit lower satisfaction levels. Further investigation is needed to identify weaknesses concerning the use of e-health systems in primary healthcare settings and among consultants. Additionally, the current investigation detected low satisfaction concerning training and data quality, indicating the need to establish training programs in healthcare settings in the Jazan region to ensure the proper use of e-health system services.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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References

1. Saudi Vision 2030. National transformation program; 2022. Available from: <https://www.vision2030.gov.sa/v2030/vrps/ntp/>. Accessed September 13, 2022.
2. Saudi Ministry of Health. National E-health strategy; 2013. Available from: <https://www.moh.gov.sa/en/Ministry/nehs/Pages/Ehealth.aspx>. Accessed September 13, 2022.
3. Saudi Ministry of Health. MOH apps for smartphones; 2022. Available from: <https://www.moh.gov.sa/en/Support/Pages/MobileApp.aspx>. Accessed September 13, 2022.
4. AlSadrah SA. Electronic medical records and health care promotion in Saudi Arabia. *Saudi Med J*. 2020;41(6):583–589. doi:10.15537/smj.2020.6.25115
5. Janett RS, Yeracaris PP. Electronic medical records in the American health system: challenges and lessons learned. *Cien Saude Colet*. 2020;25(4):1293–1304. doi:10.1590/1413-81232020254.28922019
6. Kierkegaard P. Interoperability after deployment: persistent challenges and regional strategies in Denmark. *Int J Qual Health Care*. 2015;27(2):147–153. doi:10.1093/intqhc/mzv009
7. Li YC, Yen JC, Chiu WT, Jian WS, Syed-Abdul S, Hsu MH. Building a national electronic medical record exchange system - experiences in Taiwan. *Comput Methods Programs Biomed*. 2015;121(1):14–20. doi:10.1016/j.cmpb.2015.04.013
8. Keasberry J, Scott IA, Sullivan C, Staib A, Ashby R. Going digital: a narrative overview of the clinical and organisational impacts of eHealth technologies in hospital practice. *Aust Health Rev*. 2017;41(6):646–664. doi:10.1071/AH16233
9. Jabali K, Jarrar M. Electronic health records functionalities in Saudi Arabia: obstacles and major challenges. *Glob J Health Sci*. 2018;10:50. doi:10.5539/gjhs.v10n4p50
10. Alharbi R, Qadri A, Mahnashi M, et al. Utilization of health applications among patients diagnosed with chronic diseases in Jazan, Saudi Arabia during the COVID-19 pandemic. *Patient Prefer Adherence*. 2021;15:2063–2070. doi:10.2147/PPA.S329891
11. Al Alawi S, Al Dhaheri A, Al Baloushi D, Al Dhaheri M, Prinsloo EA. Physician user satisfaction with an electronic medical records system in primary healthcare centres in Al Ain: a qualitative study. *BMJ Open*. 2014;4(11):e005569. doi:10.1136/bmjopen-2014-005569
12. Alharthi H, Youssef A, Radwan S, Al-Muallim S, Zainab A-T. Physician satisfaction with electronic medical records in a major Saudi Government hospital. *J Taibah Univ Med Sci*. 2014;9(3):213–218. doi:10.1016/j.jtumed.2014.01.004
13. Shaker HA, Farooq MU, Dhafar KO. Physicians' perception about electronic medical record system in Makkah Region, Saudi Arabia. *Avicenna J Med*. 2015;5(1):1–5. doi:10.4103/2231-0770.148499
14. El Mahalli A. Electronic health records: use and barriers among physicians in eastern province of Saudi Arabia. *Saudi J Health Sc*. 2015;4(1):32–41. doi:10.4103/2278-0521.151407
15. Earnest MA, Ross SE, Wittevrangel L, Moore LA, Lin CT. Use of a patient-accessible electronic medical record in a practice for congestive heart failure: patient and physician experiences. *J Am Med Inform Assoc*. 2004;11(5):410–417. doi:10.1197/jamia.M1479
16. Oo HM, Htun YM, Win TT, Han ZM, Zaw T, Tun KM. Information and communication technology literacy, knowledge and readiness for electronic medical record system adoption among health professionals in a tertiary hospital, Myanmar: a cross-sectional study. *PLoS One*. 2021;16(7):e0253691. doi:10.1371/journal.pone.0253691
17. Rotenstein LS, Apathy N, Landon B, Bates DW. Assessment of satisfaction with the electronic health record among physicians in physician-owned vs non-physician-owned practices. *JAMA Netw Open*. 2022;5(4):e228301–e228301. doi:10.1001/jamanetworkopen.2022.8301

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