

Exploring Patient Satisfaction Before and After Electronic Health Record (EHR) Implementation: The Kuwait Experience

by Eiman Al-Jafar, PhD

Abstract

Patient satisfaction has gained the focal position in well-planned healthcare delivery systems. The objective of this study was to investigate patient satisfaction with the quality of services provided before and after the implementation of electronic health records (EHRs) at Primary Health Care Centers (PHCCs) in Kuwait. A self-developed questionnaire was used. A random sampling was used to select 700 subjects. The response rate was 74 percent. The majority of participants (67 percent) were 19 to 34 years of age. Of the participants, 63 percent were female and 92 percent were Kuwaiti nationals. Before EHR implementation, respondents' disagreement regarding the doctor's carefulness in conducting the examination, uses of medical terminology, explanations for medication given, and time given for a patient was more than 30 percent. Disagreement regarding the rest of the questions related to the patient/physician relationship after EHR implementation was also higher (25 percent to 39 percent).

Keywords: electronic health records, patient satisfaction, primary healthcare

Background

“Empirical studies of the [electronic health record (EHR)] have increased”¹ recently, but few studies have explored the impact of EHRs on patients' satisfaction and the physician-patient relationship.

Patient satisfaction has gained the focal position in modern-day, well-planned healthcare delivery systems. Much attention within the healthcare industry is focused on patients' satisfaction with the quality of healthcare services. Several lines of research have converged on the finding that care providers' interactions with patients and their families have remarkably strong effects on clinical outcomes, functional status, and even physiologic measures of health.^{2,3} Measurement of such interactions is used as a key indicator of healthcare quality by many physicians and consumer groups. It gives useful feedback to clinicians and managers on perceived performance and satisfaction with care that may not be apparent through more traditional audit measures.⁴⁻⁷ However, patient satisfaction has not been widely studied with respect to implementation of EHRs.⁸

A study conducted by Menachemi and Collum indicated that the potential benefits of EHRs include improved clinical, organizational, and societal outcomes. Clinical outcomes include improving the quality of care provided to patients and reducing medical errors. Organizational outcomes include financial and operational benefits. Societal outcomes include the improved ability to conduct research, improved population health, and reduced costs.⁹

The Ministry of Health in Kuwait implemented various projects aimed at improving the quality of healthcare services. These comprehensive projects targeted primary, secondary, and tertiary levels of care. One project was the implementation of EHRs at the Primary Health Care Centers (PHCCs).¹⁰ The move toward implementing EHRs was a result of many factors and problems faced by the Ministry of Health. The Ministry of Health recognized the need for accurate, complete, and comprehensive patient information and data for providing quality healthcare, delivering accurate statistics, helping in the planning process, evaluating treatment effectiveness, and facilitating the decision-making process. In addition, EHRs have the potential to advance the quality of healthcare.^{11–17}

Patients who get healthcare services from Kuwait's PHCCs are often observed to complain about the quality of the services provided in general. A study was conducted in 2006 to investigate patients' satisfaction with primary healthcare in Kuwait after the implementation of EHRs without considering patients' satisfaction before the implementation.¹⁸ Although EHR implementation has several advantages, barriers to EHR adoption remain.¹⁹ Some of the barriers may include the effects on eye contact and time spent with patients.^{20, 21} Therefore, this study sought to identify patients' perception of and satisfaction with the quality of the services provided at the PHCCs before and after the implementation of EHRs. In particular, the level of satisfaction with physicians, administrative staff (receptionists), routine procedures and paperwork, waiting time before seeing the doctor, time spent at the doctor's office, working hours, and appointment availability were analyzed.

The significance of this study lies in assessing the level of healthcare quality as perceived by patients, identifying gaps between patient expectations and actual process, providing an empirical base for changes to be made by policy makers, offering feedback to care providers, and, in the long run, indicating changes that should be made in the medical curriculum.

Method

Sample

The Kuwait Health Care Delivery System includes more than 78 PHCCs. For this study, the population consisted of all patients who visited the various PHCCs in Kuwait. The data were collected using a self-developed questionnaire. The questionnaires were distributed among patients at the time of their visits at PHCCs during morning and evening shifts from September 2004 to December 2004. A total of 700 questionnaires were distributed at various clinics. At each clinic, patients were selected randomly. The patient's agreement to participate in the study was obtained before each questionnaire was completed.

Instrument

The questionnaire aimed to collect data on participants' demographic characteristics. In addition, general questions on the clinics' location, cleanliness, and decoration were included. Moreover, three separate sections addressed the patient/physician relationship before and after implementation of EHRs and the attitudes of other professionals at the clinics. At the end of the questionnaire, three open-ended questions were included. Before the data collection, the questionnaire was pretested for construct validity and reliability. The questionnaires were piloted with 20 patients, and a few adjustments were made regarding the wording of some questions.

Statistical Analysis

Data were analyzed using SPSS software. For reporting, descriptive statistics were used. In addition, factor analysis was used to identify the common significant factors regarding the patients' satisfaction with the services of the clinics.

Results

The response rate was 74 percent, with 518 patients participating out of 700 surveys distributed. The patients who visited the PHCCs included 344 (67 percent) who were 19 to 34 years of age, followed by

81 (16 percent) between 35 to 49 years and 80 (15 percent) who were 18 years of age or below. Only 12 (2 percent) of the patients were 50 years or older. Among the patients, 325 (63 percent) were female and 189 (37 percent) were male. Regarding nationalities of the patients, 465 (92 percent) were Kuwaiti and 42 (8 percent) were non-Kuwaiti. (See Table 1.)

Regarding visits to PHCCs, 475 (93 percent) had previous visits, while only 38 (7 percent) of the patients had never visited the PHCCs previously. Among the patients, 335 (65 percent) had a visit during the last 3 months, 99 (19 percent) during the last 6 months, and 81 (16 percent) during the last year or earlier. Among the patients, 83 percent had a waiting time of 20 minutes or less to see a doctor, while 17 percent had to wait more than 20 minutes. Among patients who had to wait more than 15 minutes, 18 percent were given an explanation for the delay.

General characteristics related to the clinics include the greeting on arrival, which 25 percent of the patients reported as poor, followed by the waiting room decor (reported as poor by 23 percent), waiting time (reported as poor by 19 percent), promptness of attention (18 percent poor), waiting room comfort (16 percent poor), and courtesy of the receptionist (14 percent poor). Regarding the convenience of the clinic's location, only 6 percent reported it as poor and 7 percent reported it as fair; the rest of the respondents reported it as good, very good, or excellent. (See Table 2.)

The distribution of characteristics of the patient/physician relationship before the implementation of EHRs is presented in Table 3. More than 30 percent of respondents disagreed or strongly disagreed with items regarding the doctor's carefulness about the examination, use of medical terminology, explanations provided for prescribed medication, and time allotted for the patient. The percentage of respondents disagreeing or strongly disagreeing with the other items related to the patient/physician relationship varied from 23 percent to 29 percent.

Table 4 shows the data on the patient/physician relationship after EHR implementation. After implementation of EHRs, the percentage of patients agreeing or strongly agreeing with questions related to the patient/physician relationship after implementation of EHRs, (e.g., the doctor focuses on EHR screen rather than on patient, I believe EHR took doctor's attention from me, at visit, doctor pays more attention to typing, and EHRs increase trust in physicians) varied from 36 to 50 percent.

Data on the behavior of the other professionals at the PHCCs shows the following: except for effective treatment and professionalism of staff at PHCCs, patients' agreement on other questions were 50 percent or more. Slightly more than 50 percent of the patients did not agree regarding the effectiveness of treatment and other staff members' professionalism at the PHCCs. This part of the survey is excluded from this study but will be addressed in a future study.

Discussion

The majority of Kuwait's population use the PHCCs as the first step to access healthcare services. The initial implementation of EHRs by the Ministry of Health in Kuwait took place at the PHCCs in 2002. This study aimed to investigate patient satisfaction with the quality of services provided before and after the implementation of EHRs at the PHCCs in Kuwait.

Factor Analysis

The results of exploratory factor analysis are presented in Table 5 and Table 6. Factor analysis is used to identify the common factors that explain the patients' relationship with the physician before and after implementation of EHRs and the relationships with other professionals working at the PHCCs. Using the factor loadings from factor analysis also helps to identify the construct validity of our questionnaire. Table 5 presents the factor analysis of items related to the patient/physician relationship before EHR implementation. Factor analysis identified two common factors on the basis of eigenvalues greater than 1, which explain 56 percent of total variations. The loadings of the two factors vary from 0.62 to 0.82, which showed that the construct validity of these items is very high. The first factor explains whether the physician is taking enough time to address patients' questions, such as by explaining the patient's medical problem, test, procedure, or prescribed medication, which makes a patient feel confident about the doctor. The second factor explains items that reduce the patient's confidence in the doctor.

The factor analysis of items related to the patient/physician relationship after EHR implementation identified three common factors on the basis of eigenvalues greater than 1, which explain 66 percent of total variations. The factor loadings vary from 0.57 to 0.90, which again showed that the construct validity of these items is very high. It was easy to name the three factors identified here. The first factor explained the patients' perception regarding improvement in the quality of care due to the implementation of EHRs. For example, some patients indicated that using EHRs improved relations with the physician and increased trust in the physician's performance. The second factor explained the patients' feeling about the shift of the doctor's attention from the patient to the computer screen, such that less eye contact was received. Finally, the third factor explained the patients' perception of the negative impact due to the computerization. For example, some patients did not see improvement in the clinic's system after EHR implementation. (See Table 6.)

One limitation of this study is the low participation of non-Kuwaitis in the study (8 percent) although they form the majority of Kuwait's population.

As noted above, data on the behavior of other professionals on the healthcare team working at the PHCCs were excluded from this study but will be used in a future study. Another exclusion was the results of the three open-ended questions because of difficulty in categorizing participants' answers into limited themes.

Conclusion

EHRs in healthcare settings pose challenges to medical practice.²² Therefore, more studies of EHR implementation and its effects on the medical practice in general and on physician-patient relationships are needed.

This study's results show decreased physician attention toward patients during patient visits due to the use of EHRs. EHR implementation should support positive relationships with patients and improve the quality of care.²³ Implementation of EHR systems in gradual phases in healthcare facilities will help the healthcare professionals adapt to the system as well as maintain good physician-patient relationships.²⁴

The data were gathered during 2004, when technology use was not as common among Kuwait's population as it is today. Hence, a similar study will be conducted in the near future to investigate further the impact of EHR systems on patients' satisfaction. The new study will include a larger sample size to better represent the population in Kuwait.

More studies should be conducted related to EHRs and the improvement of patient care. EHR training should be introduced for the various health care professionals and in medical schools' curricula.²⁵ Other studies should be conducted after more years have passed since EHR implementation to investigate the cost-benefit factors.

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Notes

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Table 1

Distribution of Respondents' Demographic Characteristics

Characteristic	Frequency	Percentage
Age (in years)		
18 or below	80	15
19–34	344	67
35–49	81	16
50+	12	2
Sex		
Male	189	37
Female	325	63
Nationality		
Kuwaiti	465	92
Non-Kuwaiti	42	8

Table 2

Distribution of General Clinic-related Characteristics

Characteristics	Excellent		Very Good		Good		Fair		Poor	
	N	%	N	%	N	%	N	%	N	%
Convenience of clinic's location	182	36	139	27	127	25	36	7	29	6
Clear directions within clinic	99	19	170	33	132	26	77	15	34	7
Clinic's working hours	105	21	133	26	147	29	73	14	50	10
Cleanliness	150	29	146	29	137	27	44	9	35	7
Greeting on arrival	37	7	71	14	135	26	141	28	128	25
Promptness of attention	43	8	93	18	134	26	151	30	92	18
Courtesy of receptionist	54	11	88	17	155	30	141	28	72	14
Waiting time for appointment	29	6	101	20	170	33	115	23	96	19
Waiting room decor	37	7	73	14	154	30	132	26	116	23
Waiting room comfort	32	6	81	16	168	33	148	29	83	16
Overall impression	50	10	104	20	184	36	122	24	53	10

Table 3

Distribution of Characteristics of the Patient/Physician Relationship before Implementation of Electronic Health Records (EHRs)

Characteristics	Strongly Agree		Agree		Uncertain		Disagree		Strongly Disagree	
	N	%	N	%	N	%	N	%	N	%
Doctor gives needed attention	60	12	168	33	137	27	114	22	32	6
Doctor explains reasons for medical tests	67	13	184	37	113	21	106	21	32	6
Doctor spends enough time with patient	58	11	165	33	108	21	139	27	38	8
Doctor listens carefully to my complaints	56	11	186	38	133	27	90	18	25	5
Doctor explains reason for prescribed medication	70	14	176	35	106	21	120	24	36	7
Sometimes I am not confident about the doctor's diagnosis	83	17	178	37	106	22	80	17	38	8
During visit, doctor performs complete physical check	52	10	108	21	119	23	157	31	72	14
At the visit, I am allowed to discuss my case	69	14	165	33	140	28	105	21	27	5
Sometimes doctor uses unclear medical terms	46	9	120	23	152	30	150	29	44	9

Table 4

Distribution of Characteristics of the Patient/Physician Relationship after Implementation of Electronic Health Records (EHRs)

Characteristics	Strongly Agree		Agree		Uncertain		Disagree		Strongly Disagree	
	N	%	N	%	N	%	N	%	N	%
Doctor focuses on EHR screen rather than on patient	118	23	136	27	107	21	119	23	30	6
I believe EHR took doctor's attention from me	80	16	122	24	119	23	143	28	46	9
At visit, doctor pays more attention to typing	88	17	135	27	126	25	125	25	29	6
Doctor gives copies of medical information to patient	26	5	67	14	102	20	169	34	137	27
EHRs didn't affect relationship with doctors	66	13	151	30	149	30	95	19	42	8
EHRs improved relationship with doctors	44	9	111	22	175	35	112	23	56	11
EHRs increase trust in doctors	44	9	137	27	147	29	118	24	56	11
I support using EHRs at Primary Health Care Centers (PHCCs)	127	25	178	36	102	20	57	11	37	7
I gained no benefit from EHRs	63	13	89	18	136	27	124	25	88	18
No improvement seen with EHRs	72	15	90	18	136	27	135	27	63	13

Table 5

Factor Analysis of Items Related to the Patient/Physician Relationship before Implementing Electronic Health Records (EHRs)

Items	Factor Loadings	
	Factor 1	Factor 2
v26 Doctor gives needed attention	.807	
v25 Doctor explains reasons for medical tests	.805	
v24 Doctor explains tests and procedures in understandable terms	.796	
v23 Doctor explains problem clearly	.793	
v31 Doctor listens carefully to my complaints	.788	
v22 Doctor answers all questions	.768	
v35 During my medical care I am always allowed to say everything I think is important	.735	
v30 Doctor pays more attention to privacy during care	.728	
v32 Doctor explains reason for prescribed medication	.726	
v34 During visit, doctor performs complete physical check	.712	
v21 Doctor gives needed attention	.689	
v20 Personal manner of physician	.616	
v33 Sometimes I am not confident about the doctor's diagnosis		.772
v29 Doctor sometimes ignores what I say		.730
v36 Sometimes doctor uses unclear medical terms		.657

Table 6

Factor Analysis of Items Related to the Patient/Physician Relationship after Implementing Electronic Health Records (EHRs)

Items	Factor Loadings		
	Factor 1	Factor 2	Factor 3
v44 Using the computer improved my relationship with my doctor	.847		
v45 Using the computer provides me with more trust in my doctor	.807		
v43 Implementation of electronic records did not affect my relationship with the doctor	.712		
v41 I receive adequate eye contact from doctor	.702		
v46 I support using a computer system in my clinic	.648		
v42 Doctor gives copies of medical information to patient	.588		
v38 At any time I visit the doctor, his attention is on the computer		.903	
v37 Doctor focuses more on computer screen than on me		.877	
v39 I believe EHRs took doctor's attention from me		.848	
v40 While I was receiving medical care, doctor paid more attention to typing		.774	
v48 I can't see any improvement in clinic system after computer implementation			.822
v47 I gained no benefits from using computer system			.816
v49 Consultation time increased after using computer system			.574