

Original Article

USING EMR IN A CORPORATE HOSPITAL: HEALTHCARE PROVIDERS PERSPECTIVE FROM BANGLADESH

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ABSTRACT

Background: An Electronic Medical Record (EMR) is an essential tool for delivering high-quality healthcare in a hospital. In recent years, hospitals have increased their investment in EMRs to improve the level of integrated management of information. The purpose of this study was to explore the perspectives of using EMR among healthcare providers (HCPs) in a corporate hospital in Bangladesh.

Methods: This cross-sectional study was conducted among 153 HCPs (doctors, nurses, lab technicians, drug dispensers, billing managers, and administrative personnel) who have access to EMR and working in a selected corporate hospital of Dhaka city. The study period was January to December 2019. HCPs were selected by convenience sampling technique. Data were collected by face-to-face interview using semi structured questionnaire. Data analysis was done by IBM SPSS software. Ethical issues were maintained strictly.

Result: Study revealed that 59.5% HCPs were in the age group of 18-29 years with the mean age being 29.26 (± 7.58) years. Only 32.7% HCPs had previous experience of using this type of software before working in the current hospital and 62.7% got technical training on EMR within the current hospital. The majority (81.7%) of the HCPs found that the technical training was effective for using the EMR software. The difficulty of using EMR was significantly associated with the age ($p < 0.001$), gender ($p < 0.001$), professional status ($p < 0.001$) and highest level of education ($p < 0.001$) of the HCPs. HCPs ability to overcome job related challenges was significantly associated with the professional status of them ($p < 0.001$). HCPs perception regarding effectiveness of EMR was found significantly associated with their place of technical training ($p = 0.004$) and duration of the training ($p = 0.012$).

Conclusion: EMR can be a helpful tool for the health service providers to provider health services at the corporate hospitals. Digital literacy need to be increased among the HCPs to ensure effective use of EMRs. Regular maintenance and upgrades of the technology infrastructure are necessary for advanced record-keeping and quality service.

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INTRODUCTION

An Electronic Medical Record (EMR) is defined as a repository for active notations on a patient's health; it is a computerized database that generally includes demographic, medical, laboratory, radiographic, drug, and other information about a patient. EMR systems have progressed from simple record keeping to integrated enterprise-wide systems that offer accurate, real-time access to patient's healthcare data while also delivering information needed to enhance patient care and minimize costs. Many institutions are building integrated clinical workstations, which serve as a single point of input for patient-related, administrative, and research data [1]. Because of the urgent need to improve patient safety and quality of care across many countries' disintegrating health care systems, there is a growing global recognition of the need for secure EMR systems for reliable, timely, and consistent health information recording and sharing [2]. In 2009, the USA passed the American Recovery and Reinvestment Act (ARRA), allocating \$36 billion for healthcare information technology (HIT). More than half of that was earmarked to spur the adoption of electronic medical records (EMRs), with the

aims of removing financial barriers, improving patient outcomes and reducing costs of care delivery. However, to attain these goals, an EMR must effectively meet the needs of caregivers and support care processes without substantial workflow interruption [3]. There are three types of healthcare providers (HCPs) in Bangladesh: public, private, and non-governmental organizations (NGOs). Public hospitals are generally overcrowded with patients and their families, which produces an unpleasant environment in and around the facilities. This can also result in inefficient system implementation, which causes a time lag and requires patience to wait for extended periods to get treatment [4]. EMR have become a standard practice in developed countries, revolutionizing the way by which healthcare provider store and access patient information. While in poor countries like Bangladesh, it is almost non-existent. Some corporate hospitals in Bangladesh have adopted the initiative, however they are unable to function successfully [5]. Electronic medical records (EMRs) have gained popularity in recent years, with many HCPs in developing countries adopting this technology. However, the perception of users towards EMR in these contexts is a mixed bag. Some users appreciate the ease of access and storage of medical records, while others have concerns about the security of patient information and the potential for technology malfunctions. Additionally, limited technology infrastructure and low digital literacy rates among healthcare workers can impede the implementation of EMRs in developing countries. Nonetheless, with proper training and support, EMRs can greatly improve healthcare delivery in these settings. Evaluating user's perception on EMR is vital for ensuring that it performs as intended and for identifying areas of software design improvement and development. This study aimed to explore HCPs' perception of using EMR in a corporate hospital in Dhaka city, Bangladesh.

METHODS

Study setting and study population

This was a descriptive type of cross-sectional study was conducted between January and December 2019 among the HCPs (doctors, nurses, lab technicians, drug dispensers, billing managers and administrative personnel) who have access to the EMR of United Hospital Limited (UHL), Dhaka. HCPs aged ≥ 18 years of both male and female were included in the study. HCPs who didn't use EMR were excluded from the study.

Sample size and sampling

Total 153 HCPs were included in the study. Participants were selected by convenience sampling.

Data collection

Data were collected through face-to-face interview by using a semi-structured questionnaire that included socio-demographic status of the respondents, job related information and information related to the usability of the EMR. Data collection instruments were finalized by necessary corrections and modifications on the basis of the findings of pre-test. Written informed consent was obtained from the participants prior to interview.

Data analysis

Data were analyzed using IBM SPSS (version 25). Descriptive statistics estimated mean, standard deviation and frequency while inferential statistics included Chi square test to determine association as required. The level of significance was set up at 0.05 and $p < 0.05$ was considered to be statistically significant.

Ethical consideration

The study received ethical approval from the Institutional Review Board of NIPSOM in Bangladesh. After detailing the aims and process of the study and confirming that there was no risk of bodily, mental, social, or economic harm, informed written consent was obtained from each participant. Each responder volunteered to participate in the study. Privacy and confidentiality were rigorously maintained. Respondents were free to decline participation at any time during the study. Data accessibility was limited to the author.

RESULTS

More than half (59.2%) of the HCPs were in the age group of 18-29 years, followed by 39.2% within the age group of 30-44 years. The mean age of HCPs was 29.26 (SD) years. The majority of the HCPs (62.7%) were female, and the rest (37.3%) of them were male. Among the HCPs, more than half (52.9%) were staff nurse by profession, followed by doctor (33.3%). Regarding educational level, most (49.0%) had diploma in different disciplines, followed by graduates (34.0%) (Table 1).

Table 1: Socio-demographic characteristics of the HCPs (n=153)

Socio-demographic characteristics	Frequency (f)	Percentage (%)
Age group (Years)		
18-29 years	85	56.2
30-44 years	60	39.2
45-60 years	7	4.6
Mean (\pm SD)		29.26 (\pm 7.58)
Gender		
Male	57	37.3
Female	96	62.7
Professional status		
Doctor	51	33.3
Nurse	81	52.9
Others*	21	13.7
Highest level of education		
Graduate	52	34.0
Post-graduate	26	17.0
Diploma	75	49.0

*Others=lab technicians, drug dispensers, billing managers and administrative personnel; %: Percentage, SD: Standard Deviation

Considering duration of service, the majority (62.1%) had a work experience of less than 4 years, whereas 28.8% respondents had work experience for 5 to 8 years. The majority of the HCPs (67.3%) didn't have any experience of using the software before working in the current hospital. The majority of HCPs (92.2%) had training for the software; only 7.8% HCPs didn't have any training. The maximum (49.0%) of the HCPs had training for duration of 4 to 8 days. The majority of the HCPs (81.7%) thought that the training was effective for their service delivery (Table 2).

Table 2. Distribution of the HCPs by job related attributes (n=153)

Job related attributes	Frequency (f)	Percentage (%)
Duration of service		
\leq 4 years	95	62.1
5-8 years	44	28.8
\geq 9 years	14	9.2
Experience of using EMR		
Yes	50	32.7
No	103	67.3
Technical training for EMR		
Yes	141	92.2
No	12	7.8
Place of technical training		

Within the current hospital	96	62.7
Outside current hospital	57	37.3
Duration of technical training		
≤3 days	22	14.4
4 to 8 days	75	49.0
≥ 9 days	56	36.6
Opinion regarding effectiveness of training		
Effective	125	81.7
Not effective	28	18.3

EMR: Electronic Medical Record; %: Percentage

It was estimated that, 88.2% of HCPs thought that the level of accessibility was enough for the quality of service. Most HCPs (94.1%) thought that they can coordinate their work through this software. Regarding the time and cost-effectiveness of EMR, HCPs viewed EMR as a time and cost-effective system (90.8% and 93.5% respectively). Most (98.7%) HCPs thought that their service had been made accountable through this software. Regarding confidentiality of the data, 95.4% HCPs thought that the uploaded data remained confidential in the software, and 98.7% HCPs thought that EMR was easily adaptable. It has also been revealed that 94.8% of respondents thought that EMR reduced their overall work load, and 73.2% found it difficult to use EMR. Most of the HCPs (70.6%) thought that EMR is not helpful to overcome new challenges. Almost all HCPs (99.3%) can retrieve data by using EMR, and only 15.0% could compute data in EMR. Out of all HCPs, 64.7% thought that EMR was effective for inter-departmental collaboration and 62.1% had knowledge on operating EMR. Regarding the effectiveness of EMR, 94.8% HCPs thought that the software is effective for quality service. All of the HCPs thought that this management system reduces dependency on manpower and is safe for hospital environment (Table 3).

Table 3. Attributes regarding users' perception of EMR (n=153)

Users perception related to EMR	Response of HCPs	
	Yes f (%)	No f (%)
Accessible	135 (88.2)	18 (11.8)
Co-ordinated service	144 (94.1)	9 (5.9)
Time effective	139 (90.8)	14 (9.2)
Cost effective	143 (93.5)	10 (6.5)
Accountable	151 (98.7)	2 (1.3)
Data remain confidential	146 (95.4)	7 (4.6)
Adaptable	151 (98.7)	2 (1.3)
Reduce workload	145 (94.8)	8 (5.2)
Difficulty in using EMR	41 (26.8)	112 (73.2)
Challenges can be overcome	45 (29.4)	108 (70.6)
Able to retrieve data	152 (99.3)	1 (0.7)
Able to compute data	23 (15.0)	130 (85.0)
Inter-departmental collaboration	99 (64.7)	54 (35.3)
Having operating skill	95 (62.1)	58 (37.9)
Effective for quality service	145 (94.8)	8 (5.2)

%: Percentage.

The difficulty of using EMR was significantly associated with age ($p < 0.001$) and gender distribution ($p < 0.001$) of the HCPs. Regarding professional status ($p < 0.001$) and highest level of education ($p < 0.001$), they also found significantly associated with difficulty to use EMR (Table 4).

Table 4. Association between socio-demographic characteristics of the HCPs and difficulty to use EMR

Characteristics	Difficulty of using EMR		Significance. (χ^2 -test)
	Yes, f (%)	No, f (%)	
Age group (years)			
18-29	39 (95.1)	47 (42.0)	p <0.001
30-44	1 (2.4)	59 (52.7)	
45-60	1 (2.4)	6 (5.4)	
Gender			
Male	6 (14.6)	51 ((45.5)	p <0.001
Female	35 (85.4)	61 (54.5)	
Type of HCP			
Doctor	2 (4.9)	49 (43.8)	p <0.001
Nurse	39 (95.1)	42 (37.5)	
Others	0 (0)	21 (18.8)	
Highest level of education			
Graduate	6 (14.6)	46 (41.1)	p <0.001
Post graduate	2 (4.9)	24 (21.4)	
Diploma	33 (80.5)	42 (37.5)	

χ^2 -test: Chi-square test; %: Percentage

The professional status is significantly associated with HCPs` perception to overcome job related challenges by using EMR (p<0.001) (Table 5).

Table 5: Association between socio-demographic characteristics of HCPs with their perception to overcome job related challenges by using EMR

Characteristics	Overcome job related challenges by EMR		Significance (χ^2 -test)
	Possible, f (%)	Not possible, f (%)	
Age group (years)			
18-29	23 (51.1)	63 (58.3)	p = 0.505
30-44	19 (42.2)	41 (38.0)	
45-60	3 (6.7)	4 (3.7)	
Gender			
Male	19 (42.2)	38 (35.2)	p =0.412
Female	26 (57.8)	70 (64.8)	
Type of HCP			
Doctor	6 (13.3)	45 (41.7)	p <0.001
Nurse	22 (48.9)	59 (54.6)	
Others	17 (37.8)	4 (3.7)	
Highest level of education			
Graduate	9 (20.0)	43 (39.8)	p = 0.058
Post graduate	10 (22.2)	16 (14.8)	
Diploma	26 (57.8)	49 (45.4)	

Place of training (p=0.004) and duration of technical training (p=0.012) was statistically significant with perception regarding effectiveness of EMR (Table 6).

Table 6. Association between HCPs` perception regarding effectiveness of EMR and attributes related to technical training

Attributes	HCPs` perception regarding effectiveness of EMR		Significance (Fishers exact test)
	Effective, f (%)	Ineffective, f (%)	
Having technical training			
Yes	135 (93.1)	6 (75.0)	p =0.121
No	10 (6.9)	2 (25.0%)	
Place of training			
Within current hospital	95(65.5)	1(12.5)	p =0.004
Outside the current hospital	50(34.5)	7(87.5)	
Duration of training			
<3 days	48 (33.1)	7 (87.5)	p = 0.012
4-8 days	94 (64.8)	1 (12.5)	
>9 days	3 (2.1)	0 (0)	

DISCUSSION

Based on diverse sources of information, it is evident that EMR have increasingly been adopted in Bangladesh to improve medical services and patient care. The perception of EMR among HCPs in healthcare facilities of Bangladesh has shown a positive shift in recent years. The study aimed to explore the perception of using EMR among HCPs in a corporate hospital in Bangladesh.

Present study found that mean age of HCPs was 29.26 (± 7.58) years. Another cross sectional study conducted in Malawi regarding implementation of EMR revealed that most of the EMR users' age was 41 years and above [6]. This may be due to the different employment policy of the hospital in different countries.

In present study, most of HCPs (62.7%) were female. Other studies also found that most of the employees were female [6, 7]. This is due to the fact that majority of the active participants were from nursing background, mostly lead by female workers in those hospital.

In this study, the difficulty of using EMR was significantly associated with the age and gender of the HCPs. It may be due to the fact that with increasing age especially in female, the power of adaptability decreased. HCPs might not have grown up with modern digital devices and platforms, often encounter difficulties in navigating EMR. Type of HCP and level of education were also significantly associated with feelin difficulty of using EMR. In another study, 90% of the participants rarely experience problems while operating EMR. Their most common problems experienced were freezing or not responding to commands, provision of wrong information about patients at times etc. [6]. A study conducted in Kenya revealed that system with missing features and poor performance features were the barrier for using EMR [8]. In present study, more than half of the HCPs were nurses who were mostly diploma holders, excess workload and complex healthcare needs of the patients made them over-burdened which prevent them from adopting new technologies like EMR.

Considering duration of service, 62.1% HCP had less than 4 years of work experience, whereas 28.8% had 5-8 years of experience. In another study conducted in Ethiopia, 53.4% of the users had work experience less than five years [9]. In our study, the majority of the respondents (67.3%) didn't have any experience of EMR before working in the current hospital. In another study user had a mean experience of 3.3 years of experience of using EMR and users` experience had significant impact on successful implementation of EMR [7].

In this study, most of HCPs (92.2%) had technical training on using EMR and 49.0% had training for duration of 4 to 8 days. Majority (81.7%) thought that the training was effective for their service. In another study, 98% respondents agreed or strongly agreed that training on the EMR was effective and 93% were confident in using EMR [7]. Another study revealed that HCPs who had EMR training and good computer literacy were more satisfied compared to those who had poor computer literacy [9].

Another study in Malawi, stated that the training conducted to prepare potential user of EMR was not well structured and the support given after the training was not uniform and was perceived by some participants was not enough [6]. In our study, the place of technical training ($p = 0.004$) and duration of the training (0.012) was significantly associated with HCPs perception regarding effectiveness of EMR. This may be due to the fact that, respondents who are trained in same hospital are more oriented with the same software operating system in their work place. Hence, the hospital authority should emphasize on repeated training on the same setting for improvement of effectiveness of EMR among users.

Majority (81.7%) of the HCPs found that the technical training was effective for using the EMR software. HCPs ability to overcome job related challenges was significantly associated with the professional status of them ($p < 0.001$).

Present study found that 88.2% of HCPs thought that the level of accessibility was enough for the quality of service, 94.1% thought that they can coordinate their work through this software and 98.7% HCPs thought that their service had been made accountable through this software. HCPs viewed EMR as a time and cost-effective system (90.8% and 93.5% respectively). EMR seemed to be easily adaptable for 98.7% HCPs and 95.4% HCPs thought that the uploaded data remained confidential in the software. Also 94.8% of respondents thought that EMR reduced their overall work load. Most of the HCPs (70.6%) thought that EMR is not helpful to overcome new challenges and 64.7% thought that EMR was effective for inter-departmental collaboration. Almost all HCPs (99.3%) can retrieve data by using EMR, 62.1% had knowledge on operating EMR and only 15.0% could compute data in EMR. Regarding the effectiveness of EMR, 94.8% HCPs thought that the software is effective for quality service. All of the HCPs thought that this management system reduces dependency on manpower and is safe for hospital environment.

Users` perception regarding effectiveness of EMR directly affects their engagement, satisfaction, and willingness to operate EMR. A well-designed and user-friendly interface fosters trust, efficiency, and improved patient care. Users, including HCPs, must perceive the system as intuitive, secure, and capable of providing accurate and timely information. Positive user perception enhances the adoption and utilization of EMRs, leading to better healthcare outcomes, streamlined workflows, and improved communication among HCPs. Ultimately, understanding and addressing user perception is crucial in optimizing the effectiveness and success of medical record keeping systems.

The study considered private corporate hospital but didn't consider public hospital, so, the study findings couldn't represent the country scenario. As the sample size was small, the findings derived from the study cannot be generalized to reference population.

CONCLUSION

It is widely believed that broad adoption of EMR systems lead to major health care savings, reduce medical errors, and improve health. Present study findings revealed that HCPs showed positive attitude towards adopting EMR in their workplace. The present study findings also recommended that continuous technical training should be provided to both HCPs for effective use of EMR which in turn will improve the quality of patient care and will make our HCPs capable to cope with advanced world.

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Conflict of interest

The authors declared no conflict of interests.

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