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Views of Users towards the Quality of Hospital Information System in Training Hospitals

Ali Vafaee[a], Mohammad Vahedian[a], Habibollah Esmaeily[b], Khalil Kimiafar*[c]

[a] *Department of Health and Management, Faculty of Health, Mashhad University of Medical Sciences, Mashhad, Iran*
[b] *Department of Biostatistics, Faculty of Health, Mashhad University of Medical Sciences, Mashhad, Iran*
[c] *Department of Medical Records, Faculty of Paramedical, Mashhad University of Medical Sciences, Mashhad, Iran*

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*Corresponding author:

Kimiafar K. (PhD Candidate)

Tel: +98 915 5187344

Fax: +98 511 7628088

E-mail addresses:

KimiafarKh@mums.ac.ir

ABSTRACT

Background: Users of hospital information system (HIS) use these systems during working day and know its problems better than others know. Studying their views is very important and can be especially effective in the development of the information system. The aim of this study was to investigate the users' views towards the quality of hospital information system in the training hospitals of Mashhad University of medical sciences.

Methods: The current study was an applied research in Training Hospitals of Mashhad (East of Iran), which was conducted with descriptive cross-sectional method. A four-section questionnaire was designed for data collection consisting of: characteristics of information quality, reasons of low quality of information, accessibility of information and decision support. Validity and reliability were tested and SPSS was used for data analysis.

Results: 62.8% of users explained that one of reasons of low quality information was a problem related to obtaining information. 47.7% of them were unsatisfied with hospital information system ability for decision-making support. In general, 53.2% of users were slightly satisfied with the overall quality information of the system.

Conclusion: There are some problems concerning information quality of HIS in Mashhad training hospitals. These problems include inappropriate information quality of the system and incompatibility with user needs which leads to decreased satisfaction of users towards the system.

Introduction

Today you cannot find any areas of human knowledge, which is not affected by informatics knowledge and information technology. Health and therapy issue and particularly health therapy centers according to the high capacity of information produced and variety of information using this technology is definitively essential and its outcome is to create a tool with aid of computer called Hospital Information System (HIS) which dominants a new management in therapeutic centers [1]. Since hospital information system's introduction in the 1960s, they have been used by an increasing umber of hospitals and for a growing range of services. Initially, HIS primarily provided billing and financial services. Subsequently, the role of HIS has grown to include clinical services for hospitals [2].

In fact, the need to reduce the expenditures of care, improving the quality of care and development of health services, and strategic consideration related to obtaining competitive advantages, emphasis on using HIS and explain the necessity of developing such systems [3].

Information systems, especially HIS, have the task to support patient care, hospital administration, and economic business management within hospitals. Because of the increasing importance of efficient information processing,

systematic information management is typically seen as a central management task. The complex processes in health care, which are highly informative and communicative, have to be analyzed, controlled and continuously adapted [4]. HIS play a significant role in providing quality health care services [5]. In such a dynamic environment, information and communication technologies (ICT) are taking a leading role and are currently significantly affecting the practice of health care at all levels. The catalyst for change in the health care sector, based on the use of ICT, is the improved quality of health care services and the containment of related costs [6].

HIS plays an important role in providing high quality health care services [5]. However, HIS has lagged behind in using information technology and quality standards for satisfaction of clients comparing other industrial and business systems [7]. HIS provides the capability to improve and develop the interactions between personnel and wards inside and organizations outside of hospital [8].

Efficacy and convenience are not mutually exclusive, indeed are mutually dependent, as concerns user adoption of new HIS [9]. Hospitals of Mashhad University of Medical Sciences (MUMS) are used to face problem concerning broadness of this province and various referrals in therapeutic management of patients and clinical centers. To manage this problem, top managers decided to use HIS. Consequently, In Iran (1997) HIS was performed as a national experimental project in Mashhad, northeast of Iran and now installation and process of this system in Mashhad training hospitals is developing.

Assessments of HIS were concentrated on financial and client's advantages till now and the important part is user's view which is often neglected [10]. Users of clinical information system are in fact considered as clients of system, services, and its information [11]. If HIS does not identify the expectations of users, it will be neglected by them; even they consider the system as a disturber or saboteur [12]. Reflection of department and 2 people in radiology ward were using this system.

The data collection tool was a part of a questionnaire, which was designed and accred-

user's dissatisfaction can affect on expenditures and quality of health care [11].

By identifying the elements of user's dissatisfaction related to information quality of HIS and its analysis, this system can be improved and in result, the quality of health care will be increased.

The aim of this study was to investigate the users' views towards the quality of HIS in the training hospitals of MUMS. Regular assessments of HIS will support clinical implementations and financial and managerial performances of health care staffs and cause clinical software to be reformed and developed according to users needs [10].

Materials and Methods

This study was conducted as an applied research based on descriptive cross-sectional method. It was implemented in three training hospitals of Mashhad (East of Iran) with clinical information system in MUMS in 2006. This study was a part of a research, which prepared for assessing the quality of HIS. The statistical population of this research was 500 users and this number was obtained through passing code list, which was defined, for users by system manager. Entrance criteria's included: staffs will to participate in study and at least a one-year-activity in hospital as a user. In the first step according to duration of research, hospital users according to kind of users (Nurses, Medical Records, Accountants, laboratory stuffs, Pharmacist and Radiology) were classified in six groups.

In this research, volume of sample was determined according to the information of similar study [13] which estimated 77 persons but because of the probable in samples, it was changed to 80 persons. Therefore, the list of all users was prepared and samples were selected in related to volume of their population in each group randomly. As a sample volume 14 people in accounting unit, 6 people in laboratory, 8 people as a ward secretary, 20 people as nurse, 4 people in drugstore, 26 people in medical records

ited very well [5]. Mentioned questionnaire was given to authorities and experts to determine its validity regarding different sources and referring to books, magazines, and publications and

the questionnaire's reliability was confirmed using test-retest exam (Test-Retest) (r=0.76). This questionnaire included four parts: characteristics of information quality (Table 2), reasons of low quality information (Table 3), accessibility of information (5 questions), and support of decision (8 questions). Then the average of scores acquired from questionnaire classified to the five following groups:

Very low: 1 – 1.8

Low: 1.8 – 2.6

To some extend: 2.6 – 3.4

High: 3.4 – 4.2

Very high: 4.2 – 5

In section of reasons of low quality information, each item was evaluated separately and users could choose more than one option.

For data analyzing, questions was assessed via base on likret 5-choice scales and grading was done by SPSS software.

Results

In the field of demographic characteristics of users, their age and sex were investigated. The majority of HIS users (42.7%) aged between 25% to 29. 69% were women and 51.4% of them with bachelor degree and higher. In the field of how users interact with HIS, the role of

users related to HIS was investigated which in this research the majority of users (32.5%) have worked in medical record ward, 25% in nursing unit and minority of users were in radiology ward. Most of users (62.5%) have used HIS for entering managerial data during working day.

Findings in this research indicated that 32.9% of users were to some extend satisfied concerning the information quality of HIS (Table 1).

Table 1: Frequency distribution of user's satisfaction towards information quality of HIS

User's satisfaction towards information quality of HIS		
Items	Frequency	Frequency Percentage
Very high	8	10.1
High	36	49.4
To some extend	26	32.9
Low	5	6.3
Very low	1	1.3

User's view towards clinical information system in regard to information quality was as : 45.6% of users have considered the clinical information system accurate, 48.1% to some extend perfect, 39% applicable, 45.5% to some extend adequate, 55.4% understandable, 45.6 to some extend safe, 43.6% to some extend well-timed and 51.9% consider its reliability high (Table 2).

Table 2: Frequency distribution of user's view towards information quality

user's view towards information quality							
Item	Frequency Percentage						
Score	Accurate	Perfect	Applicable	Adequate	Understandable	Safe	Well-Time	Reliability
very high	11.4	7.6	18.2	6.5	12.7	7.6	6.4	8.9
High	45.6	38	39	33.8	55.4	38	42.3	51.9
To some extend	35.4	48.1	36.4	45.5	27.8	45.8	43.6	20.3
Low	7.6	3.8	6.5	14.3	3.8	6.3	6.4	17.7
Very low	0	2.5	0	0	1.3	2.5	1.3	1.3

Study results in the field of user's view about the reasons of some low quality information, indicated that 62.8% of users consider the problem of obtaining information as a reason of low

quality information in relation to equipments and hardware. In the field of reasons related to process, 48.7% knows the lack of personnel as a reason and 47.4% the lack of training (Table 3).

Table 3: Frequency distribution of user's view towards HIS concerning some information's low quality

	Reasons of information's low quality in clinical information system		
Items		**Frequency**	**Frequency Percentage**
Equipments and hardware	Lack of tool for entering data	7	9
	Inappropriate tool for entering data	16	20.5
	Entering data concentrated not well	24	30.8
	Mutilated tools for entering data	14	17.9
	Problems related to obtaining information	49	62.8
	Other matters	3	3.8
Process	Lack of personnel	38	48.7
	Lack of training	37	47.4
	Lack of data	24	30.8
	Extensive rewriting	7	9
	The processes is not defined clearly	18	23.1
	Other matters	1	1.3
People	Mistakes in type	28	35.9
	Unconcern	49	62.8
	Negligence	16	20.5
	Other matters	6	7.7
Software	Lack of automatic data review	23	29.5
	Boring page interface	19	24.4
	Other matters	4	5.1

Regarding user's view towards accessibility of information, findings indicated that 59% of users consider the suitability of the location of information accessibility to partly appropriate, 41% accessible and the same percentage consider it to some extend accessible and 55.1% of users consider the data easy to recover (Table 4).

Table 4: Frequency distribution of user's view towards HIS in related to accessibility of its information

	user's view towards HIS in related to accessibility of its information		
	Frequency Percentage		
Items Score	**Suitability of the location of information accessibility**	**Accessible**	**Easy to Recover**
very high	6.4	12.8	9
High	59	41	55.1
To some extend	30.8	41	28.2
Low	3.8	5.1	6.4
Very low	0	0	1.3

Fifty seven percent of users used HIS for decision-making. Findings showed that HIS was used in hospital mainly for decision making in related to medical matters (Table 5). 47.7% of users believed that effect of HIS on decision-making efficiency was high (Table 6).

The results in the field of inevitability of HIS backup in decision-making indicated that 43.2% of users have considered it very important and 47.7% of these were dissatisfied with the capability of HIS to support decision-making.

Table 5: Frequency distribution of decision making with use of HIS from user's view

Decision making matters	**Frequency**	**Percentage**
Medical decision making	23	51.1
Financial decision making	18	40
Other decision making matters	4	8.9

Table 6: Frequency distribution of user's view effect of HIS on decision-making efficiency

Effect of HIS on decision making efficiency		
Items	Frequency	Frequency Percentage
Very high	7	15.9
High	21	47.7
To some extend	12	27.3
Low	3	6.8
Very low	1	2.3

Discussion

Using HIS in the field of managerial tasks of hospital is one of primary aims of using this system, which mostly effect on reducing expenditure and have caused therapy staff to have more time expending on patient's care and therapy. In this study, the most number of users (62.5%) used HIS during working day to enter managerial data. Results of Mahajan and Milton [14] researches about clinical expenditures also showed before using HIS nearly 30% of clinical expenditures have spent on gathering, storing and tracking information and managerial tasks and approximately 30% of personnel time have involved in such activities.

According to this point that most of users (45.6%) have considered the safety characteristics of information system to some extend safe, this point should be reminded that HIS beside providing easy accessibility of medical data for users, on the other hand should also kept information away from unauthorized users. Reaching these two inconsistent and different aims, means easy accessibility of medical data and simultaneously confidentiality of information together will become difficult. The most common mediate solution for solving this inconsistence is to specify a password and describing the level of accessibility for every authorized user. Accessibility to data by a special user or group of users should be controlled [15].

Delone and MC Lean [16] declared parameters of exactness, being well timed, reliability, comprehensiveness, intelligibility, and coherence to determine quality level of data and they showed importance of comprehensiveness, intelligibility, coherence, and confidentiality parameters in determination of quality level of data in 2003.

Subject to reasons of information's low quality from users' point of view in process part, most of the users believe in lack of staff that due to volume of works and lack of staff in training hospitals, substantial measures have to be taken. in addition 47.4% of users believe in lack of training as a reason that can be manage by holding training classes, guides, guidelines and educational brochures which must be provided by supporting team of HIS. Provide and design menus that help and guide users through different parts of the system during work with HIS, can be very useful.

In reviewing the accessibility of information from users' point of view, most of the users (39.2%) were satisfied with this part and 38% satisfied. Hereupon, Moghadasi [17] states in his study: accessibility of information which is introduced by some organizations as one of information quality, surely not related to formation factors of data's nature to be count as data's quality characteristics, but related to storage, retrieval and distribution (issuing information) process and in fact are part of the quality of management information system. Moghadasi declares concerning "accessibility" on behalf of global health care organization and Abdulhulk that all data must be easily accessible and applicable when is needed (for all clinical, organizational and administrative affairs) and their gathering must not have any legal restrictions. If data are not accessible, the value of their gathering and accuracy of their record will be ruined.

Most of the users (47.7%) were not satisfied with capability of clinical information system in supporting of decision-making. Contrary to the results of this study, Ayatullahi [13] in his survey concluded that from users' point of view the success of ADS-9[1] software in application of gathered information in medical surveys at the level of executive and central office was 80% and in supporting of upper managers' decision making in order to train physicians was 72.28 % and in decision making of upper managers to equip the therapy wards of hospitals was 77.14% [13].

What are the unexplored possibilities for creatively embedding features in HIS that make them excite rather than repel their users? That actually makes them fun to use, even if only for an introductory period.

In this research, users view points regarding quality of HIS were studied, and other aspects of

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[1] - Admission and Discharge System- 9 revision

system such as cost effectiveness, that are so important in quality of HIS, and something about study population and sampling have not evaluated.

Conclusion

According to the findings of research which showed the low level of user's satisfaction and problems related to the information quality of clinical information system it is suggested:

- Designing different part of the system use menus, graphical images which are all being attractive and make a user friendly environment for users and easier to learn
- Providing the possibility of reforming errors and wrong information for users, provide them the capability of easy returning to the system.
- Increasing the system accountability speed, advance hardware and connection lines should be used to minimize the interrupt between user's request and system's answer.
- Avoiding system's damage and data's harm in time of malfunctioning and insufficiency, frequent backups should be obtained.
- Limiting the level of people's accessibility to information should be implemented upon their need to know, to ensure the ease of accessibility to medial data, confidentiality and information safety is maintained.
- Training people who gather and enter data should be continuously trained.

Acknowledgements

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