



Using a Comprehensive Hospital Information System to Promote Qualified Healthcare Information as Perceived by the Hospital Staff of Affiliated with Hormozgan University of Medical Sciences

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ABSTRACT

Comprehensive system of hospital information is well-organized software designed to effectively integrate and transfer hospital information. It helps to promote the quality of data, reduce the transfer time, raise users' satisfaction, increase the quality of services and lower the costs in hospitals. In assessing the quality of information systems, quality is a function of system usability, completeness, timeliness, data regularity and definition. The present research aimed to investigate the effect of a comprehensive system of hospital information on promoting the quality of healthcare information in the hospitals affiliated with Hormozgan University of medical sciences. The present descriptive, cross-sectional research looked into the attitude of 45 staff working in the medical file center and the IT center using a questionnaire developed by the researchers the reliability and validity of which were already checked via a census in 2016. The data were analyzed through descriptive and inferential statistics in SPSS v.17.0. An investigation of subjects' age showed that the most frequent age group was 25-30 years which comprised 48.9% of the sample. Next stood the age group 30-35 years which had 35.6% of the subjects. The results of analyzing the role of HIS in promoting the quality of healthcare information revealed that applying HIS promoted the update and security of data to respectively 42.2% and 31.1%. Moreover, 18 subjects of the research population assessed the effect of HIS on data transfer among hospital wards to be the highest (40%). Half of the population had a positive attitude towards the effect of HIS on information system processes and on promoting the quality of healthcare information in hospitals. Less than 2% of the subjects had a negative attitude towards the same system. Moreover, half of the population acknowledged that HIS played a key role in promoting the quality of healthcare information and recommended the use of the comprehensive system in hospitals.

Key words: Hospital Information System, Role, Information Quality

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Information is considered today as a key source of power in the world as a basis of decision-making and planning [2].

INTRODUCTION

Hospital information system is a computer-based system used as an electronic management device for patients' information and, therefore, plays a key role in further qualifying the healthcare services. Hospital information system improves the reception, organization, storage, retrieval and distribution of data as well as decision-making [1].

Such an advanced health information system facilitates access to certain information in research project. It can also contribute to the achievement of research goals. However, the application of such systems, despite many benefits, suffers from certain disadvantages too which have questioned their appropriateness in several communities. Among them mention can be made of the health care staff's disbelief in the

benefits of this method, concerns about the ethical issues, confidentiality of the data as well as the high costs of this system [3].

Hospital information systems are huge and systematic databases used to integrate patients' data in official and executive procedures [4].

Among them, hospitals play a key role in the health system to store patients' vital data. Moreover, considering customers' great expectations, hospitals' national and international competitions, inefficiency of manual methods, medical errors in recording patients' vital data, need for mechanized healthcare services and activities, presence of a standardized and integrative information management system is essential for the high achievement of hospitals [5]. In 1960s and 70s, not to fall behind the other groups, physicians began projects to use this technology in meeting healthcare needs. Software and computer systems were separate from each other then, and in 90% of cases the recommended strategies were not fully implemented or used [6]. In an investigation in Taiwan which explored nurses' attitude towards the factors involved in the quality of hospital information systems, the results revealed that ease of use and comprehending how to use the system had a tremendous effect on receiving the system warmly for 45.1% [7].

A body of global research indicated that using HIS helped to promote the quality of healthcare services and raised patients' satisfaction [8].

In another study in the U.S. on the effect of HIS on lowering the costs in hospitals revealed 30% of reduction of costs once HIS was employed [8]. The findings obtained by Lee *et al.* from the employment of a computer system indicated that the system caused an increased efficiency and also facilitated the related activities [9].

Due to the fact that electronic technology and IT led to an information boom in the past decade, there is a need for certain systems that can produce and manage data. There has been also a rise in applying the communicative system in healthcare affairs which needs support in management and decision-making [10].

HIS aims to be used in computer and communication devices which help to collect, save, process, extract and communicate healthcare data

for a proper management of the target data. In other words, the data are stored in a database but can simultaneously be accessed by authorized users or certain users at a particular time and place [11].

Hospital information system enables hospital managers to access the required data whenever and wherever needed. Real data increases the efficiency and efficacy of the hospital [12].

Considering the role of hospital information system in communicating information to service providers, hospital managers and researchers, the present research aimed to investigate the effect of this system on the quality of hospital services and tasks. The target hospitals were affiliated with Hormozgan University of medical sciences. Identification of system weaknesses or inconsistencies can help managers and authorities to reform the tasks or conform to the needs [9].

MATERIALS AND METHODS

To obtain the attitude of the staff working at medical records and IT center of hospitals affiliated with Hormozgan University of medical sciences, a descriptive, cross sectional study was conducted in 2015. It aimed to find the attitude towards the effect of a comprehensive hospital information system on the quality of healthcare services. Sampling was done through a census and due to the limited research population, all the staff who met the inclusion criteria entered the study. Accordingly, 45 subjects filled out a questionnaire which investigated the role of hospital information system in users' tasks and activities. It also looked into the effect of the same system on the quality of data according to Dr. Moghaddasi's biological systemic model [13]. The effect of this system was further assessed on data communication and transfer, reporting, analysis, recording and archiving the data in the official and financial procedures of hospitals. The questionnaire was developed by researchers and was comprised of three sections. The first section contained demographic information while the second section explored the role of the hospital information system in promoting the quality of healthcare services. The third section looked into the effect of the hospital information system software. The data gathering instrument was a questionnaire developed by the researchers and the respondents filled it out with full consent. In case they were not willing to take part they could

leave the study. The commentaries made by several field specialists (in Health IT domain) were used to confirm the content validity of the questionnaire. The reliability was statistically tested through Cronbach's alpha and was estimated to be .93. The data were analyzed using SPSS ver.16.0 with the help of descriptive statistics (frequency, mean and percentage).

RESULTS

The ratings made by the staff working with medical files and in the IT center about the role of HIS in promoting the quality of health information showed that 84.4% of the subjects (n=38) were female while the rest were male. As for age, the most frequent age group was 25-30 years which comprised 48.9% and only next stood the 30-35 age group which contained 35.6% of the whole population. 36 subjects (80%) held a B.S. degree which was the most common academic degree in the population. The next most frequent academic degree was associate degree held by 6 subjects (13.3%). 3 subjects (6.7%) held a diploma. Concerning their work experience, 35.6% of the subjects had less than 5 years of experience. The majority of subjects held 10-15 years of experience. The minority had 5-10 years of working experience (22.2%) 6.7% of the subjects had more than 15 years of experience.

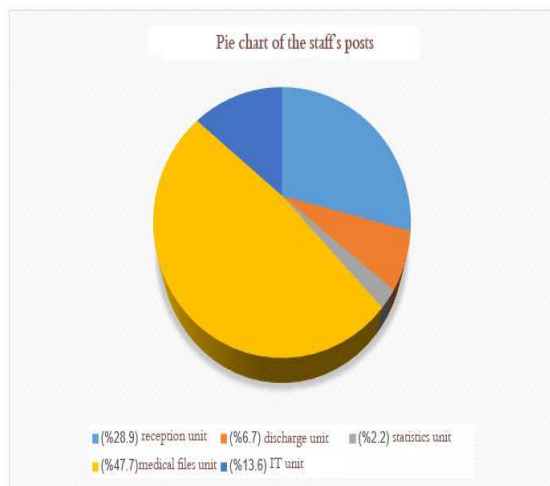


Figure 1: Distribution of the staff's posts in the medical files and IT center

To look into the subjects' rating of the role of HIS in promoting the quality of healthcare information, 5 key aspects of quality pinpointed in Moghadasi's biologic systemic model of data quality were checked for [13]. The results

indicated that 51.1% of the population (n=23) rated data regularity and relevancy high. 40% of the population (n=18) rated the definition of the data as high. Furthermore, 46.7% of the subjects maintained that employing HIS increased the accuracy of the data required for the system. It was acknowledged by 42.2% of the population that using HIS made no difference in the completeness of the data. Timeliness of the data, however, was rated by 48.9% of the subjects to have increased.

Table 1: HIS and promoting the quality of healthcare information and other properties

Properties of data quality required for hospital information system	%	n.	Final rating
Documentation	44.4	20	high
Being up-to-date	42.2	19	high
Accessibility	51.1	23	high
comprehensibility	44.4	20	high
Security (confidentiality)	33.3	15	moderate
adequacy	44.4	20	moderate

The results related to the effect of HIS on hospital information system procedures revealed that it truly facilitated the reception and treatment processes respectively for 46.7% and 31.1%. The target population rated the employment of HIS as effective in managing hospital costs for 33.3%. It also led to a 40% of reduction in the length of patients' stay in hospital.

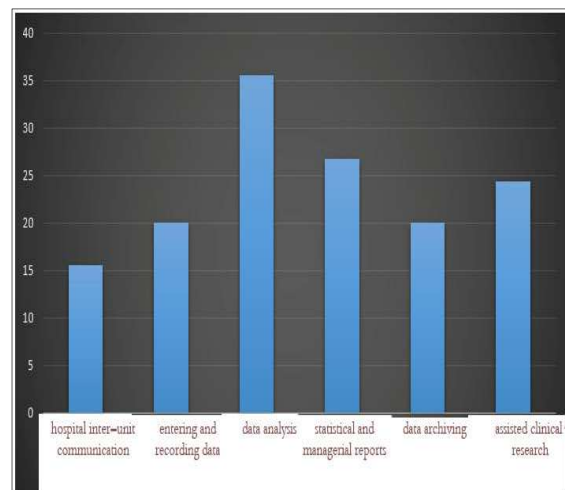


Figure 2: Mean rating of HIS in the following cases

35.03% of the research population rated the role of HIS in hospital information system procedures as positive. However, 1.95% rated it as negative. Moreover, 29.79% of the population expressed a

positive attitude towards the role of HIS in promoting the quality of healthcare information.

DISCUSSION AND CONCLUSION

The present study aimed to investigate the attitude of the staff working in the medical files and IT center of hospitals affiliated with Hormozgan University of medical sciences towards the role of HIS in promoting the quality of healthcare information. The present descriptive research was conducted in 2016. The research findings obtained by Schman and Vijay concerning hospital costs revealed 30% of reduction in the target costs once HIS was applied. The role of hospital costs in this system was estimated to be 33.3% [4]. In another study, 40% of the subjects maintained that employing HIS reduced the overall costs [12]. These findings are consistent with the present research.

In the present research, the role of HIS in recording data was 42.2% which is similar to another study in Masih Daneshvari hospital of Tehran in 2011 which reported the same value to be 44%. Although the findings of the present research are more in line with that in Tehran, in the latter research, users perceived the software truly potent in hospital inter-unit communication (81%). The same value was estimated as 42.2% in the present research [14]. Still in some other research, 81.6% stated that employing HIS increased data transfer among the hospital units as compared to the past [12].

In order to optimize the efficiency of inter-unit communication, more attention needs to be paid to inter-unit data communication part of this system.

In a qualitative investigation of using HIS in third-grade Malaysian hospitals in 2010, they found that empowered human forces, efficient support system, ease of using the system and instructing system users are involved in the success of this system [15].

22.2% of the present research population rated system security positive in this system which is consistent with the findings of an investigation in Semnan which reported 24.2% of higher data security [4]. However, in some other research 32.5% of the staff showed to be to some extent satisfied with the security matter [16].

In a body of research, system definition or self-description was reported to be rated as good

(10%) in contrast with the present findings which showed 40% of good rating. This might show the fact that the required data managed to be well defined through time [7].

In some research, 13.8% of users at the medical files center and the IT center rated this system as accessible. This is quite consistent with the present finding that showed 15.6% of users rated the same system as accessible [16].

Another study indicated that 63% of the staff rated the more effective inter-unit communication; 58% rated the accessibility of data in clinical research; 57% rated the reports and data output; 47% rated the integrity and regularity of the sub-systems. These are inconsistent with the present findings which might be due to the fact that this research was conducted in 36 hospitals in Tehran and Karaj which makes up a vast population. The staffs working at hospitals in Tehran are usually more experienced and have spent longer time working with such a system. This diverges from the small population of the present research which could be at least part of the reason why the results were different [6].

In the research conducted in Tehran the mean score of rating the role of this system in promoting quality was 28% in terms of the completeness property, 24% in terms of the adequacy of data, 32% regarding the completeness of the quality of data, 32% concerning the comprehensibility of data, 37% in terms of the usability and documentation of data and 43% regarding the comprehensibility of data. These are consistent with the findings of the present study and the overall findings attested to the fact that quality properties in HIS were moderate or poor. It is, therefore, suggested that the required changes are made to the system so as to raise the quality properties [14].

Broadly speaking, the subjects in the present research had a positive attitude towards HIS though it was rated to be moderate or poor. This system needs to be enhanced due to its significance in providing quality data to be used systematically in hospital information systems. There is a need for enhancing such systems as well as the staff's skills. It needs to be reminded that HIS is directly involved in the development and empowering of human forces from many aspects: more knowledge and awareness, higher quality

and performance, better decision-making skills, more job opportunities, self-management and professional development

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