

Designing an Organizational Memory Model for Reporting the Medical Errors

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Abstract: Background: The increasing growth in the volume of the data in the organizations and the resultant challenges due to medical errors during the last two decades have made the necessity of reporting and managing medical errors more apparent. Organizational memory (OM) has been known as one of the tools appropriate for implementing knowledge management. The goal of the present study is to design an organizational memory model for medical departments of the teaching and medical centers of Charmahal va Bakhtiyari province in Iran. Materials and Methods: This study is descriptive – applied in nature and its population consisted of the personnel of teaching-medical centers in Charmahal va Bakhtiyari province. Identifying the processes was performed through observation and the required data for identifying and reporting the medical errors was collected through conducting one structured interview with 65 personnel from the medical departments of 5 centers under research. OMs were derived through library research and online search. Based on the results of need-analysis and reviewing of the models, the proposed model was prepared and then was judged and evaluated by the medical professionals through Delphi test technique. Results: The personnel who took part in the study believed if they have access to the data and information required for reporting the medical errors, they will have a better performance (85%). they regarded the use of organizational memory as a necessity (98%) and enumerated the occurrence of errors, slowness of the work, irregularity, discontent and wonderlessness of the customers as some challenges resulting from human error and system fault (86%). Discussions: Organizational memory system which relates organizational knowledge to job functions related to reporting the errors not to recognize the wrongdoer but to prevent error repetition, is one of the requirements of the medical centers which can promote the efficiency and organizational learning.

[Mirzaeian R, Mobasheri M, Khaledifar B. **Designing an Organizational Memory Model for Reporting the Medical Errors.** *Life Sci J* 2013;10(4):3630-3635] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 486

Keywords: Organizational; Memory Model; Medical Error.

1. Introduction

To survive, each organization has to receive 3 types of information continuously i.e. information about its surrounding environment, information about the past and information about its internal context and its constituents (Stein, 1995). Following the worldwide change (Sinotte, 2004) the managers and management theorists have increasingly focused on the organizations' intellectual. Duncan enumerates the complexity of the societies, the globalization process, the increasing development in information technology and communications and the necessity of rapid and all-encompassing changes in the organizations and societies as some reasons for the today growing attention to the knowledge and information (Duncan, 1982). Organizations have some experiences in physical and financial assets management, using formal and semi-formal mechanisms for getting, maintaining and using other resources (Miller, 1997). However, they face some difficulty when trying to get, create, store, publish and use intellectual assets (Snis, 2000). Based on study findings, despite the increase in knowledge significance, just 30% of the knowledge

available in the organization are used (Lehner, 2000). Due to the lack of access to data, costly but preventable errors occur. The risk of wasting and losing knowledge is more serious when the individuals do not cooperate with the organization (Spek, 1994). According to another study, %74 of the respondents argued the best knowledge in their organizations is inaccessible, while %68 claimed that the errors are repeated because many do not dare to confess the errors (Gazeau, 2001). Medical and health care organizations more or less are involved with similar problems and challenges. Today, medical and health care organizations have turn into a huge and widespread organization possessing highly intricate resources of information and knowledge (Abidi, 2001). This industry belongs to a category of organizations which greatly require data and information so as to survive (Curran, 2004 & Drucker, 1998) and are empowered through complicated knowledge resources (NHS Scotland, 2003). In fact, knowledge forms the basic and underlying foundation of such organizations causing the system to work with the best efficiency (Hall, 2004). There does seem to be

a consensus among the health and medical care practitioners over the effect that high volume of the data will place on their work efficiency (Beckett, 2000). One of the domains of medical and health care organization in which there is a tangible need to organizational memory tool is medical errors management and record.

In November 1999, the American Medical Institute in its report titled "Human being is not infallible: the Creation of a Safer Health Care System" drew the authorities' attention to errors in the health care system of the *United States of America*. Medical errors cost teaching hospitals \$5 million every year. Annual charges imposed upon USA's economy by medical errors have been estimated about \$17 to \$29 billion (Jane, 2010 & Omalley, 2007). Medical errors have been reported for about %4 of the inpatients in the USA's hospitals. Based on the America's National Institute of Health, the yearly hospital mortality rate due to drug errors among the inpatients is 44000-98000 (Omalley, 2007 & Kazley, 2011 & Jones, 2006). Medical errors ranks eighth among the mortality causes in the USA (William, 2007). Meanwhile, according to the American Hospital Association's estimation, drug errors account for 30.5% of the mortal medical errors (Jane, 2010).

In 2003, Canada devoted over \$16 or 500 billion to drug expenditures per person and now, there has been a %10-increase in the investment in this domain of health care system (Morgan, 2004). In Australia, medication-related problems accounted for %2-3 of the causes of hospitalization of the patients with %50 of it being of preventable type. Australia Pharmacy Society, Australia Hospital Pharmacists Association and Australia Drug Counselors are among the pioneers of medication management and medication-related complications resolution (Sansom, 2009).

Hence, to prevent the errors and repeating them, some forms of memory tools are available (Koornneef, 2004) organizational memory is used for storing the data which can be used as a reference for organization's future decisions (Lukas, 1996) acting as an important factor for achieving success in the organizational operations and how they respond to the challenges and changes in the organization context (Huber, 1991 & Stein, 1995). One type of such organizational changes occurs when the organization personnel become aware of the importance of the issue (Croasdell, 2001). Organizational memory has been considered as a tool for errors management and different scholars have enumerated numerous benefits for it (Abidi, 2001 & Walsh, 1991 & Kruse, 2003). Therefore, in line with the significance of recording and reporting medical errors, a model is introduced with which medical and health care personnel are familiar. The goal of designing this model is to

provide a motivator for controlling and following the medical errors which occur during the years in the centers under research.

2. Methodology

This study is of descriptive-analytical nature. Research context consisted of 5 teaching and medical hospitals i.e. Hajar, Ayatollah Kashani, Valiy-e- Asr, Shohada of Lordegan city and Seyyed Al-shohada of Farsan city. Its population included medical and health care personnel selected from among the pharmacists and medical records personnel. The sample which was in conformity of the population consisted of 8 pharmacists and 57 medical records personnel. Data gathering instrument was a questionnaire covering 16 items regarding the working processes, the working activities of the personnel, knowledge and data required for these activities. The personnel giving these data were interviewed and their opinions regarding the necessity of using organizational memory as well as some necessary issues about registering and reporting the medical errors were collected. To prepare the questionnaire, the questions available in the knowledge audit and knowledge management were used. To assess the validity and reliability of the interview's questionnaire, it was presented to eight professors. After reviewing and applying their opinions, the final questionnaire was produced. To assess the reliability of the questionnaire, test-retest method was used. After two months from the first interview, the questionnaire was completed again. After ensuring the reliability of the questionnaire, the main data were collected ($r=0.82$). Data gathering process was based on the researcher's direct visit to the medical and health care centers checking the data documentation operations from the time of the patient's admission until sending the patient profile to the medical records departments. Common processes were identified for all the centers. Then, the above-mentioned questionnaire was filled in through face to face interview. At this stage, it was necessary for the personnel to identify the activities they were involved as well as the data and information which they required for better performance.

Regarding the model designed for the processes, it is noteworthy that at the first stage, the personnel of one of the centers with which the researcher was completely familiar were requested to outline their working processes. Since all the personnel working in the department had been taught the FOCUS PDCA model related to quality promotion and clinical authority execution in the training workshops previously, they could easily delineate their working processes with the participation of other individuals involved in them. To do so, they used prototype model for illustrating their working processes. Then, the researcher herself outlined work flow diagrams based

on the outlined prototype diagrams observing the work stages in each process. The produced diagrams were then checked with the cooperation of the personnel of the selected centers in the interview phase so that no process may be ignored due to the absentmindedness of the personnel. In this way, the diagram can be complete in terms of the details being usable as a model for the desired goal. In this phase, the study was of qualitative type and Delphi test was taken from all professors expert in the knowledge management and organizational memory fields working in Charmahal o Bakhtiyari province. For the Delphi test, the used questionnaire included items related to the components and attributes of the model designed for the organizational memory. The attributes and components extracted from the textual resources for an organizational memory besides the researcher's own viewpoints were tested in terms of the components of organizational memory model.

These components were as follows: essential knowledge and information, personnel's essential attributes, functions' essential attributes, processes' essential attributes as well as medical errors record and report.

3. Results:

To facilitate the analysis, the findings of the study were summarized in four tables that are as follows: the attributes of the medical and health care organization's personnel in the selected centers in terms of educational degree and gender in table 1, the results of the interviews with the personnel working in the selected centers regarding the necessity of organizational memory in managing medical errors in table 2, the personnel's responses to the questions on how they receive knowledge and information in table 3 and finally the essential functions of the organizational memory obtained from the Delphi test in table 4.

Table 1. The Characteristics of Medical and Health Care Organization in the Selected Centers in Terms of Educational Degree and Gender

Educational Degree	Pharmacists		Medical Records Personnel		Total	
	Male	Female	Male	Female	Male	Female
Kashani Hospital	1	1	7	12	8	13
Hajar Hospital	-	2	5	14	5	16
Boroujen's Vali-e-Asr	1	1	3	2	4	3
Lordegan's Shohada Hospital	-	1	2	4	2	5
Farsan's Seyyed Al-shohada	-	1	3	5	3	6
Total	2	6	20	20	22	43

Table 2. The Results of the Interviews with the Personnel Working in the Selected Centers Regarding the Necessity of Organizational Memory for Managing Medical Errors

Questions	Pharmacists		Medical Records Personnel	
	Yes	No	Yes	No
Is organizational memory necessary for managing medical errors?	%93	%7	%98	%25
If your required data is available in the computer, do you like to use them?	%99	%1	%85	%15
Do you easily convey your job-related knowledge to others?	%85	%15	%75	%25
Do other personnel who have some information about your job easily transfer them to you?	%50	%50	%55	%45
Have you ever experienced an error in the patient's treatment process which has not been recorded or reported?	%73	%27	%86	%14
Have the hospital's authorities welcomed report or record of the medical errors by you?	%87	%13	%20	%80

Table 3. The Responses of the Personnel to the Questions Regarding the Way of Receiving Knowledge and Information

Questions	Very high	High	Medium	Low
The essential functions of organizational memory according to Delphi test's results	Agree	agree	Disagree	Disagree
Personnel believe if they have access to their required knowledge and information, their performance will be greatly improved.	%5	%85	%10	0
Personnel believe if they have access to data related to the medical errors, they can prevent their repetition.	%3	%74	%18	%5
Personnel believe using computer and modern technology may be effective for recording and reporting the medical errors.	%23	%61	%16	0
Personnel believe performing medical activities in the written form and within observing the instruction is effective for managing medical errors.	%80	%17	%3	0

Table 4. The Essential Functions of Organizational Memory based on the Results of Delphi Test

The Essential Functions of the Organizational Memory based on the Results of Delphi Test	Agree	Percent (%)	Disagree	Percent (%)
Making the knowledge and information available in the organizational memory timely	12	85.7	2	14.3
Classification and organization of the knowledge and data	13	92.8	1	7.2
Active publication of the knowledge and information to those who need them.	14	100	0	0
Continuous evaluation of the knowledge and information in terms of their accuracy, validity, precision and being up-to-date	11	78.6	3	21.4
Continuous evaluation of application of the knowledge and information by the users	14	100	0	0
Gathering required knowledge regularly from inside and outside of the organization	12	87.5	2	14.3
Omission of the knowledge related to the processes which have been stopped	7	50	7	50
Applying technology for the advancement of executive operations based on organizational memory models	9	60.1	5	39.99

4. Discussion:

The personnel obtain their job-related information firstly from their respective unit's authority (%60), their colleagues (%30) and other resources. In one study on the medical records departments of two hospitals, Malone reported that the personnel collect information required for performing their routine functions from various resources. The written definition collections are not same and they seem to suffer from some paradox and contradiction so that it can be claimed that no one knows the new regulations and bylaws related to the repayment method to the discharged patients (Malone, 2001). %98 of the personnel of the medical records department believed that organizational memory is an inevitable necessity for them so that if they have access to the required knowledge and information, their functional performance will greatly be improved (%85). These findings are in line with findings of Croasdell and Paradice's study on the students' management (Croasdell, 2002). According to Beckett, there is a consensus among the health care practitioners based on which the work efficiency is affected by the high volume of the data (Beckett, 2000). %75 of the personnel claimed that they convey their knowledge and information to others easily and eagerly, while just %55 asserted that other personnel convey their information to them. Apparently, this fact justifies why the personnel are more willing to use written knowledge and information (%75). Personnel's reluctance towards conveying their information and knowledge have been mentioned by different scholars (Rubenstein, 2005 & Liebowitz, 2000). Zargarzadeh et al in one study entitled "Improper Drug Order Writing for the Aged People in Isfahan in 2004" checked the drug orders of 3000

patients aged over 65 living in Isfahan city. They found that there was at least one medication error in the form of drug-drug interaction or at least two drugs from the same category. Multi-variable analysis was also done to determine the reasons of dispensing at least one improper drug which covered age, gender, drug interactions, prescribing two drugs from the same category, the number of the drugs in the prescription and level of physician's experience factors. Based on the analysis results, 285 of the patients (%9.5) suffered from one type of medication interaction, while 746 (%27.6) received at least one or two drugs from the same category (Zargarzadeh, 2004). Berhold in his study titled "Checking the Medical Guidelines in the Drug Committee of Germany Physicians Association (2005)" asserted that based on the estimation of this committee, more than 90% of the physicians use drug information system guidelines at the time of writing the order and consider them as effective and useful tools. Surprisingly, the regional distribution of the guidelines is completely different ranging between 37% and 85% (Berthold, 2005). Mirzaeian in her research on evaluation of the performance of pharmacy information systems in use by the hospitals of the city of Isfahan reported that the highest mean score for the registration of medication errors and reporting them in these hospitals is %10/4 (saqaeian nejad, 2013).

Azizi in his study argued that the highest level of conformity with America Physicians College's criteria is related to presenting drug information report and the mean scores obtained for the hospitals in question were found to be %78/5, %75 and %74 (Azizi, 2011). Hutman and Berger believed the evaluation is intended for investigating whether organizational memory's goals have been satisfied or not. For

instance, based on function-oriented viewpoint, measurement of retrieval's efficiency can reflect the organizational memory quality (Weinberger, 2000).

There are knowledge gaps between the instructions and real-world performance, theory and practice and experience and evidence. One way to fill in such knowledge gap is empowering the personnel to juxtapose different knowledge resources. To put it differently, they should be able to integrate the knowledge obtained from various resources based on conceptual conformity capacity to provide a multi-dimensional knowledge covering instructions, experiences, documents etc. (Klamma, 1999). Wahle and Groothuis have enumerated some reasons for the necessity of knowledge management in medical and health care organizations which are as follows the use of new payment and cost calculation systems in the hospitals, the aging process of the population, emphasis on higher quality, efficiency and effectiveness and growing emergence of highly technical fields (Wahle, 2005).

5. Conclusions:

The last noteworthy point is that in the various textbooks about organizational memory system, just one aspect of this system such as the general design of the system, the method of using the system, the phases of creation of the system or the way of evaluating the system has been focused on and discussed. Organizational memory system which relates organizational knowledge to job functions related to delivering errors report not to identify the culprit but to prevent error repetition is regarded as one of the requirements of a medical department which can promote efficiency and organizational learning.

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12/12/2013