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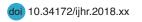
Error Management Culture and its Impact on Hospital Performance: A Case Study in Iran

Mohammad Ranjbar¹, Ameneh Khosrav¹, Mohammad amin Bahrami¹, Sima Rafiei²*

¹Health Policy and Management Research Center, School of Public Health, Shahid Saoughi University of Medical Sciences, Yazd, Iran
²Social Determinants of Health Research Center, Qazvin University of Medical Sciences, Qazvin, Iran

Abstract

Background and Objectives: In recent decades medical errors have become a major issue for scientific investigation to avoid potential harmful failures threatening patients' health and safety. Developing risk management culture has been considered not only to play an important role in detecting and coping effectively with such errors but also lead to high level of organizational performance. This study aimed to examine the impact of risk management culture on the performance of training hospitals affiliated by Yazd University of Medical Sciences.
Methods: This descriptive analytical study was conducted in three training hospitals affiliated by Yazd University of Medical Sciences. Research sample consisted of 150 nurses working in the hospitals who have been selected by proportional randomized sampling method. Data were collected using a standard questionnaire developed by Dyck et al. Collected data were entered in SPSS version 20 and analyzed through descriptive analysis methods (mean, standard deviation), and Pearson correlation coefficient.
Findings: The highest mean score related to error management and performance belonged to hospital A (3.84 + 0.32, 3.49 + 0.49). In both hospitals A and B, a significant statistical relationship between error management culture and organizational performance was approved.
Conclusions: Study findings suggested that improvement in error management culture would lead to higher level of performance. In fact, supportive culture in error management could be translated to high organizational performance through decreasing negative error consequences.
Keywords: Error management culture, hospital performance, nurse, teaching hospital.

Background and Objectives

In recent decades medical errors have become a major issue for scientific investigation to avoid harmful failures which potentially threaten patients' health and safety.[1,2] Despite great efforts of healthcare provider individuals and institutions to avoid care processes' errors, still many mistakes continue to occur in such areas of service provision.[3] According to statistical reports released by Iran Social Security Organization, approximately 14 000 work related incidents occur annually which dramatically result in 120 deaths and 150 cases of disability. Across the country this number is considerably greater with reasons mostly rooted in human causes.[4]

Medical error occurs when a healthcare provider applies an improper care or treatment approach or uses a correct method in an inappropriate way. Globally, it was estimated that such errors resulted in 142 000 deaths among care services recipients in 2013.[5] Among which annually 44 000 to 98 000 preventable deaths and 1 000 000 injuries belonged to the United States' hospitals.[6-8] In the United Kingdom, a study conducted in 2000 found that about 850 000 medical errors occur yearly which impose over 2 billion Euros to the health system.[9] In the United States, medical errors are the third contributing factors in population mortality which bring 7000 deaths from medication errors and 20 000 deaths from other types of errors in hospitals.[10] Almost one out of ten people admitted to a hospital encounters with an adverse event which half of them are due to a permanent medical error.[11] Adverse event is defined as an injury caused through a medical procedure that increases hospital length of stay and results in patients' disability at discharge time.[12] Medical errors are mainly related to lack

*Corresponding Author: Sima Rafiei, 2Social Determinants of Health Research Center, Qazvin University of Medical Sciences, Qazvin, Iran, Tel: 09107006236, Email: sima.rafie@gmail.com

of knowledge, skill and experience among medical staff or facing with an unknown situation due to new procedures or being caught in a complex or emergency care.[13]

Poor documentation, improper communication, inadequate workforce and drugs with similar name and appearance could also lead to such problems. In fact a great amount of incidents contribute to poorly designed systems, wrong procedures and incompetent providers.[14] To avoid such errors and harmful effects, healthcare providers must clearly define and clarify adverse events with an accurate description of their outcomes.[15,16] Rather than just addressing systemic failures and trying to modify them, special attention should be given to preventive strategies which mainly focus on developing risk management culture in healthcare organizations. Use of such non punitive approach increases voluntary error reporting by 10 or even more fold.[17] Therefore, to reduce the risk of medical errors in health services provided for patients, a considerable effort is needed in all levels of healthcare systems. Both human and financial commitment are required so that all staff being accountable and responsible to accompolish their duties safely, carefully and with the lowest possible error.[17]

To do so, hospital staff and managers must believe that error is always possible but working together as a team can provide a supportive culture and environment which minimizes the likelihood of error.[18] Error management culture includes identification of risky events, sharing related experiences in a great extent and handling them in the shortest possible time.[19]

Several researches concluded that high-error management culture could lead to higher levels of performance through decreasing adverse error consequences by promoting "learning from errors" culture, and open communication among all of the employees. Actually, in organizations with a robust management culture, the undesirable consequences of errors can easily be controlled; as most of the employees are aware of the probability of errors occurrence in different working conditions, and consequently the necessity of making durable attempts to control the potential damages resulting from errors.[20]

Some of the researches revealed that medical centers with high level of performance reported greater number of errors. They explained that in such organizations there was an improved error climate, which endorsed employees to share their experiences about errors, and as a result increase the capacity of error detection.[20] Ultimately, willingness to report errors and discuss about them would stimulate learning from errors in medical settings.[21] Thus, the way of dealing with errors is related to the organizational culture.[22] In organizations of which errors are regarded as normal part of the work and employees are not punished due to the error occurrence, there is less tendency among organizational members to hide errors. This constructive climate not only motivates employees to report any potential errors, but rather considers mistakes as opportunities for productive learning and a key part of active error management.[23]

Error management program brings about some main consequences for the organization. First of all, it decreases the costs of mistakes through a prospective approach and learning culture. Second, it leads organizations stand behind determined mission and objectives, besides complying with quality standards.[24] In line with existing literature, there is a cultural dimension to how organizations deal with errors. Consequently, learning from errors leads to higher performance in different kinds of organizations.[25-27] As literature confirms that developing risk management culture in healthcare organizations has led to success in performance improvement, we decided to conduct a study to examine the importance of risk management culture on the performance of training hospitals affiliated by Yazd University of Medical Sciences.

Methods

This was a cross sectional descriptive-analytical study conducted in a cross-sectional form in three teaching hospitals affiliated by Yazd University of Medical Sciences in the year 2016. Risk management programs are almost mainly applicable and prevalent in tertiary care teaching hospitals; therefore, mentioning the culture for such services will be easier at these three hospitals. Research population consisted of all nurses working in under study hospitals who have been selected by proportional randomized sampling method. The questionnaire was administered in the hospital setting and nurses independently completed it. The questionnaires were in pencil-paper format. Based on sample size formula, 150 nurses were included from whom 70 nurses were selected from hospital A, 37 from hospital B and 43 from hospital C. To mention ethical considerations, study participants were acknowledged about the study objectives and were informed about the possibility to leave the research any time they wanted to.

To gather the data, a standard data collection instrument entitled "error orientation questionnaire (EOQ)" which had been developed by Dyck et al[20] was used. The validity and reliability of the questionnaire was checked in a study conducted by Shirazipour.[28] Data regarding the demographic characteristics of study population including their age, gender, educational level, and work experience

was gathered from study participants and included in the analysis processes. The questionnaire contained 31 questions among which 21 measure error management culture and 10 are related to organizational performance. Two indicators of organizational performance including goal achievement and survivability were used to determine how well an organization acts regarding to its goals also to capture how successful the institution is in comparison to other competitors. Items were rated on a 5-point Likert scale ranging from 1 "not at all" to 5 "extremely". The maximum and minimum obtainable scores were relatively 1 and 5. Score below 3 was considered as undesirable condition and score above that was regarded as acceptable state for both error management culture and hospital performance. Collected data was analyzed in SPSS version 20 through descriptive analysis methods (mean and standard deviation), and analytical methods including Pearson correlation coefficient. Significance level was 0.05.

Results

The majority of study participants belonged to women (72.1%) in age group of 31-40 years old (44.2%). Among study sample, 73.5% were married, 95.2% had bachelor degree or higher educational level and 30.6% had 5 years or less working experience (Table 1).

Table 2 depicts mean scores of error management culture among nurses and hospital performance in under study hospitals. As a whole, error management mean score was (3.68±0.41) and average score of performance was (3.31±0.49). Furthermore, both the highest mean score related to error management and performance belonged to hospital A (3.84±0.32, 3.49±0.49).

A significant statistical relationship between error management culture and organizational performance was approved in hospitals A and B reporting that improvement in error management culture would lead to higher level of performance ($P \leq 0.05$). In fact supportive culture in error management would be translated to high organizational performance by decreasing negative error consequences (Table 3).

Discussion

Error management culture in hospitals plays a facilitator role of learning from errors through communication and development of shared knowledge.[19] Sharing error experiences among an organization staff helps them to effectively face with precarious conditions and facilitate timely detection and management of errors.[29,30]

In this study, error management culture among nurses was evaluated to be at a acceptable level. Similar literatures confirmed our findings,[31,32] but some others evaluated the overall level of error management culture to be excellent.[33] On the other hand, there are some studies in which the status of error management culture was reported unacceptable among study hospitals.[34] Diversity in research findings might be associated with different levels of attention given to the error management and the existence of effective program to deal with the issue. In fact, guiding such kinds of activities requires strategic planning and particular communication processes in order to ensure safe health service delivery across medical settings. Furthermore, in some of the provider institutions giving adequate attention to error management

Table 1. Frequency Distribution of Demographic Characteristics of Nurses and Their Relationship With Error Management Culture

Variable		No.	Percent	*P*Value
Sex	Female	106	72.1	0.1
	Male	41	27.9	
Age group	20-30	49	33.3	0.2
	31-40	65	44.2	
	41-50	33	22.4	
Marital status	Single	39	26.5	0.1
	Married	108	73.5	
Educational level	Under bachelor degree	7	8.4	0.1
	Bachelor degree or upper	140	95.2	
Work experience	<5 years	45	20.4	0.07
	5-10 years	30	66.1	
	11-15 years	36	24.5	
	16-20 years	24	16.3	
	≥21	12	8.2	

Table 2. Mean Scores of Error Management and Hospital Performance

Hospitals	Error Management Culture	Min	Max	Mean ± SD
A	Risk management	3.24	4.48	3.84 ± 0.32
	Performance	2.1	4.4	3.49 ± 0.49
B	Risk management	2.52	5.81	3.61 ± 0.49
	Performance	1.8	4.4	3.18 ± 0.52
C	Risk management	3.24	4.05	3.64 ± 0.25
	Performance	2.6	3.9	3.37 ± 0.35
Total	Risk management	2.52	5.8	3.68 ± 0.41
	Performance	1.8	4.4	3.3 ± 0.49

Table 3. Relationship Between Error Management Culture and Hospital Performance

Error Management Culture		r	*P* Value
Hospital performance	A	0.4	0.01
	B	0.1	0.00
	C	0.2	0.4

has been neglected due to heavy workload, working in a blaming and punitive atmosphere, fear of reporting error outcomes and most importantly, inadequate senior managers' commitment toward patient safety and quality improvement strategies.

In studying the relationship between error management culture and demographic characteristics of nurses, findings revealed no significant association in this regard. Similarly Zaboli et al found no significant relationship between education, type of working department, type of employment, and studied culture among nurses.[35] This finding is also in line with studies conducted by Hannah et al in Virginia, and Foruzan.[31,34,36] Instead, they believed that improving safety in hospitals requires some climate changes such as promoting team development and interpersonal interactions with the aim of improving performance indicators through encouraging personnel to report errors, and reveal weaknesses of existing system. Such an approach expands managers' ability to analyze the root causes of adverse events which consequently empowers us to prevent future events effectively.

Study findings showed a significant statistical relation between error management culture and organizational performance which was confirmed by similar researches conducted worldwide. Several studies highlighted that organizations with higher levels of error management culture in which non punitive strategies were supported and staff worked as a team, tended to timely error handling and ultimately resulted in better organizational performance.[37-39] Our results are also in consistent with Edmondson,[37] Helmreich,[29] Frese,[40] Madsen and Desai[41] who found out the positive influence of communication

and learning from errors on safety promotion goals of an organization. The effectiveness of these factors is not the same in different healthcare settings and it mainly depends on values, norms, and procedures related to error management among organizational members.[13,14] These norms consequently affect the employees' attitude, and behaviors regarding patient safety and quality improvement compared with other priorities. The underlying culture also has an important impact on staff perceptions about acceptable behavior toward error management in the work place.

Supportive safety culture in healthcare settings can act a key role in early identification of failures which can improve patient safety in an effective manner. Lack of this culture and insufficient commitment of senior managers in hospitals are important determinants of improper reactions to unwanted errors and adverse events.

Conclusions

Hospitals should develop and implement an effective risk management program to detect, analyze, prevent or cope with both active and latent failures in a way to remove or eliminate their occurrence. To achieve this goal using different approaches such as education, sharing experiences and fostering error reporting culture could be beneficial. Therefore, health workforce must support teamwork in order to develop a safety culture which mainly focuses on reporting, analysis and reducing the frequency or harmful effects of medical errors. Reforming working processes, compliance with standard procedures and encouraging staff to achieve organizational goals through proper relationship and cooperative team works could also decrease the probability of medical errors and successfully improve the organization's performance. This study clarifies the importance of risk management on success of organizational performance for hospital managers and clinical staff.

Conflict of interest

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