

Evaluation of International Standards of Quality Improvement and Patient Safety (QPS) in Hospitals of Tehran University of Medical Sciences (TUMS) from the Managers' Point of View

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Abstract: The objective of this study was to evaluate quality improvement and (QPS) in hospitals of (TUMS) from the managers' point of view. This was a cross sectional descriptive-analytic study conducted in two steps in all hospitals of Tehran University of Medical Sciences. In the first step, the applicability of the standards in hospitals was studied. In the second step, the current status of hospitals was compared with the QPS standards. In order to determine the validity of the questionnaires, opinions of professors and experts were acquired. Regarding the reliability, the SPSS software version 11.5 calculated the value of Cronbach's α to be 0.95 for the first questionnaire and 0.86 for the second questionnaire. Data were analyzed using statistic tests of one way ANOVA and t-test. The level of significance was fixed at 0.5. In the 16 hospitals studied; the mean and standard deviation of QPS were 51.6 and 12.27, respectively. Results of analysis of variance indicated that the number of beds affects the domains of data collection for quality monitoring ($p=0.043$). The QPS standards are applicable in hospitals of Tehran University of Medical Sciences according to half (43.8%) of managers; nonetheless, their application requires greater efforts by the hospitals.

Key words: Evaluation • Quality improvement • Patient safety • Managers • Hospitals

INTRODUCTION

The American College of Surgeons (ACS) was the first to design standards of patient safety in 1917 and initiated hospital inspections in 1918 [1]. The Joint Committee on Accreditation of Hospitals (JCAH) was started in 1951 as a non-profit organization for voluntary accreditation of hospitals; it published the accreditation standards of hospitals in 1953 and thus the accreditation studies started [2, 3]. In 1987, the scope of accreditation services of the JCAH was extended to include other healthcare organizations and therefore it was renamed to the Joint Committee on Accreditation of Healthcare Organizations – JCAHO [1, 4]. In 2003, the JCAHO introduced the goals of patient safety in order to focus the efforts of improvement of healthcare organizations on a set of prioritized challenges [1, 5].

Patient safety is greatly influenced by the development of programs of healthcare quality. The number of hospitals which design safety programs has been rising during the recent years [2, 6] and more hospitals are receiving the JCAHO certificate, magnet status and leapfrog patient safety awards [2, 7]. According to the World Health Organization, quality is the key factor in improving the outcomes of health as well as providing efficient services[3, 8]. In a report titled "Reinforcement of Health Systems", the World Health Organization required all health organizations to consider the improvement of health outcomes as an objective [9, 10].

Although the need for quality improvement in healthcare is universalized, the concept of achieving efficient improvement in healthcare remains to be ideally understood. Hospitals are responsible for reinforcing the

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health system and this may be accomplished only through quality improvement [11-13].

Evaluation of university hospitals provides a clear commitment for quality improvement and patient safety. Numerous studies have demonstrated that the international JCI standards affect the management and leadership, quality improvement and patient safety, ethical function, improvement process, documentation, organizational learning, patient satisfaction and, in general, organizational excellence significantly. As long as physicians, nurses and hospital managers are determined to assess patients' needs and provide care, the standards of quality improvement and patient safety (QPS), as one domain of the international JCI standards, will help them realize reform and improvement for helping patients and reducing risks [14-16].

Therefore, we took upon ourselves to evaluate the applicability of standards of quality improvement and patient safety in hospitals of Tehran University of Medical Sciences from the managers' point of view.

MATERIALS AND METHODS

This is a cross-sectional descriptive-analytic study conducted in two steps in hospitals of Tehran University of Medical Sciences from July to December 2010. In the first step, the applicability of the standards in the study environment was assessed with a questionnaire comprised of the QPS standards and 38 questions with three choices (applicable, relatively applicable, inapplicable). The questionnaire contained 6 questions in the domain of leadership and planning, 2 in the domain of designing clinical and managerial procedures, 21 in the domain of data collection for quality monitoring, 6 in the domain of analysis of monitoring data and 3 in the domain of improvement. The questionnaires were completed by the managers of each of 16 hospitals. After collection, the overall Cronbach's α was determined to be 0.9519 for the first questionnaire. Then, in order to determine the impact of each question, the coefficient was calculated with omission of one question at a time. The findings indicated that the coefficients varied from 0.94 to 0.96 and omission of each question did not alter the coefficient significantly. Thus, the applicability of all standards was established and the second questionnaire used all measurement elements. In the second step, the sample size was determined in such a fashion as to allow a maximum error of estimation of 1 with a confidence of 95%. Given the fact that there are 16 hospitals supervised by the Tehran University of Medical Sciences, the sample size was determined to be 64 so that 4 individuals in each hospital, i.e. senior managers (manager and nursing manager) and personnel of office of clinical governance, completed the questionnaires. In two hospitals, however, due to

presence of only one person in the office of clinical governance, only three questionnaires were completed, yielding a total of 62 questionnaires completed. The second questionnaire consisted of measurable elements of QPS standards in the form of 63 questions with Yes/No answers. The questions consisted of 19 questions in the domain of leadership and planning, 5 in the domain of designing clinical and managerial procedures, 22 in the domain of data collection for quality monitoring, and 7 in the domain of improvement. In order to determine the content validity of the questionnaires, opinions and suggestions of professors and experts of management of healthcare services were used. Regarding the reliability of questionnaires, the SPSS software version 11 determined the value of Cronbach's α to be 0.95 for the first questionnaire and 0.86 for the second questionnaire. Data analysis was accomplished using SPSS software version 11.5 and statistical tests of one way ANOVA and t-test. The level of significance was fixed at 0.5.

RESULTS

The 16 hospitals studied consisted of 4 (25.8%) general hospitals and 12 (74.2%) were specialized hospitals. The number of beds in hospitals ranged from 69 to 537, with a mean value of 249.7 and standard deviation of 145.6. In the present study, 25 men (40.32%) and 37 women (59.67%) completed the questionnaires. The field of study was management for 13 (20.9%), medicine and nursing for 31 (50%) and others for 18 (29.1%) of respondents. 16 (25.8%) questionnaires were completed by hospitals managers, 16 (25.8%) were completed by hospital matrons and 30 (48.4%) were completed by personnel of the office of clinical governance.

The findings of the study, separated for each domain, are as follows:

Domain of Leadership and Programming: The mean and standard deviation of score for this domain were 16.46 and 3.41, respectively. In this domain, the measurable elements "*Is the quality improvement and patient safety program being implemented in the organization?*" and "*Does the quality improvement and patient safety program influence the designing of hospital procedures?*" received positive answers from 61 (98.4%) respondents. The least rate of positive answer pertained to the measurable element "*Is notification achieved through efficient media on a conventional and legal basis?*" with 44 (71%) positive responses.

Domain of Designing Clinical and Managerial Procedures: The mean and standard deviation of score in this domain were 4 and 1.48, respectively. 55 (88.7%) of respondents answered positive to the measurable element

"Do managers implement therapeutic protocols for conduct of procedures of patient care?" while 46 (74.2%) answered positive to the measurable element *"Are tools and principles of quality improvement used for designing new procedures or modifying current procedures?"*

Domain of Data Collection for Monitoring Quality: In this domain, the mean and standard deviation of score were 7.6 and 2.76, respectively. The measurable elements *"Do managers consider the support of science and evidence for the selected scales?", "Are the results of monitoring submitted to supervisors, as well as managerial and supervisory authorities in a periodic fashion?"* and *"Are the data resulting from clinical monitoring used for evaluation of the improvement process?"* received positive answers by 52 (83.9%) respondents while 36 (58.1%) responded positively to the measurable element *"Is there a score identified for each scale?"*

Domain of Analysis of Monitoring Data: In this domain, the mean and standard deviation of score were 16.9 and 5.20, respectively. 59 (95.2%) respondents answered

positive to the measurable element *"Are accidents analyzed?"* whereas 40 (64.5%) gave positive answer to the measurable element *"Are adverse accidents occurring in moderate and deep sedation and anesthesia analyzed?"*

Domain of Improvement: In the improvement domain, the mean and standard deviation were 6 and 1.49, respectively. The measurable element *"Are domains prioritized by hospital managers considered in the reformative activities?"* received 58 (93.5%) positive responses. 41 (66.1%) respondents answered positive to the measurable element *"Are changes tried before implementation?"*

QPS: In general, the mean and standard deviation of QPS scores in the hospitals studied were 51.6 and 12.27, respectively. The mean scores of general hospitals were lower compared to specialized hospitals in domains of leadership and planning, analysis of monitoring data, improvement and QPS. However, the general hospitals scored higher in domains of designing clinical and managerial procedures and data collection for monitoring quality (Table 1).

Table 1: Mean and standard deviation of scores of each domain and QPS for type of hospital in hospitals of Tehran University of Medical Sciences in 2010

Domain	Type of Hospital	Mean	Standard Deviation
Leadership and planning	General	15.9	2.7
	Specialized	16.8	3.61
Designing managerial and clinical procedures	General	4.06	1.3
	Specialized	3.93	1.5
Data collection for monitoring quality	General	7.8	1.9
	Specialized	7.5	3
Analysis of monitoring data	General	16.4	3.9
	Specialized	17	5.6
Improvement	General	5.8	1.5
	Specialized	6	1.4
QPS	General	50.2	8.2
	Specialized	51.3	13.4

Table 2: Mean and standard deviation and results of t-test related to scores of each domain and QPS for type of hospital in hospitals of Tehran University of Medical Sciences in 2010

Domain	Number	Type of Hospital	Mean	Standard Deviation	P value
Leadership and planning	46	General	16.89	3.61	0.34
	16	Specialized	15.93	2.74	
Designing managerial and clinical procedures	46	General	3.97	1.54	0.84
	16	Specialized	4.06	1.34	
Data collection for monitoring quality	46	General	7.56	3.00	0.70
	16	Specialized	7.87	1.96	
Analysis of monitoring data	46	General	17.06	5.60	0.68
	16	Specialized	16.43	3.96	
Improvement	46	General	6.06	1.48	0.56
	16	Specialized	5.81	1.55	
QPS	46	General	51.34	13.44	0.76
	16	Specialized	50.25	8.28	

Table 3: Mean and standard deviation and results of t-test related to scores of each domain and QPS for gender in hospitals of Tehran University of Medical Sciences in 2010

Domain	Gender	Number	Mean	Standard Deviation	P value
Leadership and planning	Male	25	16.12	4.55	0.38
	Female	37	17	2.36	
Designing managerial and clinical procedures	Male	25	4.04	1.30	0.86
	Female	37	3.97	1.60	
Data collection for monitoring quality	Male	25	7.40	2.62	0.57
	Female	37	7.81	2.87	
Analysis of monitoring data	Male	25	17.16	5.08	0.75
	Female	37	16.72	5.35	
Improvement	Male	25	5.76	2.00	0.36
	Female	37	6.16	1.01	
QPS	Male	25	50.48	13.62	0.76
	Female	37	51.45	11.44	

Table 4: Mean and standard deviation and results of t-test related to scores of each domain and QPS for organizational position of respondents in hospitals of Tehran University of Medical Sciences in 2010

	Indices & Test Results									
	Manager		Matron		Clinical Governance		Total		Test Result	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	P	
Leadership and planning	15.75	4.75	17.75	1.77	16.53	3.18	16.64	3.41	0.25	
Designing managerial and clinical procedures	3.93	1.28	4.56	0.96	3.73	1.74	4	1.48	0.19	
Data collection for monitoring quality	7.50	2.47	8.62	2.60	7.20	2.94	7.64	2.76	0.24	
Analysis of monitoring data	17	4.57	18.62	4.12	15.93	5.90	16.90	5.20	0.25	
Improvement	5.93	1.61	6.12	1.45	5.96	1.49	6	1.49	0.92	
QPS	50.12	12.96	55.68	9.31	49.1	12.98	51.06	12.27	0.21	

Evaluation of Factors Affecting Scores of Domains and QPS: According to the t-test, the type of hospital and gender of respondents do not affect any of the domains and QPS (Tables 2, 3).

Analysis of variance indicated that the position of respondents does not influence the domains and QPS (Table 4).

Results of analysis of variance indicated that the number of beds affects the domains of data collection for monitoring quality ($p=0.043$), analysis of monitoring data ($p=0.007$) and QPS ($p=0.03$).

Scheffe's multiple comparison indicated that in the domain of analysis of monitoring data, the mean scores of hospitals with fewer than 109 beds and those with more than 246 beds are significantly different ($p=0.007$), whereas the difference between mean QPS scores of hospitals with fewer than 109 beds and those with more than 246 beds is marginally significant ($p=0.05$).

Analysis of variance indicated that the respondents' field of study only affected the domain of data collection for monitoring quality ($p=0.004$).

Scheffe's multiple comparison indicated that in the domain of data collection for monitoring quality, only a marginally significant difference is observed between the mean scores of those respondents who have studied medicine/nursing and those who have studied management.

DISCUSSION

Domain of Leadership and Planning: Kavari states that the managers assume a particularly important role in any organization and knowledge of leadership constitutes a major responsibility of managers alongside planning, organizing and controlling [17].

According to our findings, 53.3% of questionnaires received a score of 18-19; in other words, 33 (53.3%) respondents believed that the standards of this domain are being implemented excellently.

Sanaz Amirifar (2010) reported the rate of observance of leadership and planning standards to be equal to 24% in the emergency ward of a general hospital of Tehran University of Medical Sciences [18].

Turani *et al.* (2010) reported the rates of observance of leadership and planning standards to be equal to 78%, 63% and 54% in three hospitals of Iran University of Medical Sciences [19].

Comparison with Iranian studies indicates that implementation of systems of quality management and models of excellence raise the score of leadership.

Domain of Designing Clinical and Managerial Procedures: Patients' health is affected by different healthcare procedures [20, 21].

According to our findings, 61.3% of questionnaires scored 5, indicating that 38 (61.3%) respondents believe that the standards of this domain are being implemented excellently.

Sanaz Amirifar (2010) reported the rate of observance of clinical procedures standards to be equal to 27% in the emergency ward of a general hospital of Tehran University of Medical Sciences [18]. The discrepancy between our study and the one mentioned above may be accounted for by the fact that the latter was conducted only in one ward, i.e. the emergency department, whereas our study evaluated the procedure designing in all hospitals.

Domain of Data Collection for Monitoring Quality: Hospitals are required to present a report of their quality improvement activities [21]. Results of projects of quality improvement are published extensively [21-23], and these results influence the health policies significantly [24]. Presenting a report requires data collection and analysis. Our findings indicate that 53.4% of questionnaires scored 9-10; in other words, 33 (53.4%) respondents believed that the standards of this domain are being implemented excellently.

Sanaz Amirifar (2010) reported the rate of observance of standards of data collection and monitoring to be equal to 39.5% and 29.3%, respectively, in the emergency ward of a general hospital of Tehran University of Medical Sciences [18].

Turani *et al.* (2010) reported the rates of observance of standards of managerial monitoring to be equal to 70%, 58.5% and 53% in three hospitals of Iran University of Medical Sciences [19].

Turani *et al.* (2010) reported the rates of observance of standards of clinical monitoring to be equal to 62%, 54% and 58.5% in three hospitals of Iran University of Medical Sciences [19].

The findings of the present study and other studies indicate that implementation of systems of quality management and models of excellence and observing their requirements raise the score.

Domain of Analysis of Monitoring Data: In data analysis certain issues must be carefully noted, such as quality control. Methods of quality control contribute to accuracy of data in stages of collection, analysis and reporting [21].

In our study, 38.3% of questionnaires scored 20-22, indicating that 24 (38.3%) respondents believed that the standards of this domain are being implemented excellently. 38 respondents believed that the standards are being implemented poorly or with mediocrity.

Turani *et al.* (2010) reported the rates of observance of standards of data collection and analysis to be equal to 78%, 55% and 64% in three hospitals of Iran University of Medical Sciences [19].

Our findings are consistent with those of Turani *et al.* Thus, it may be concluded that in data are analyzed and monitored acceptably in hospitals which enjoy a system of quality management and excellence.

Domain of Improvement: Nabilo[24] and Donini [25] have highlighted the role or participation of workers and increasing their creativity in organizations for the purpose of perpetual quality improvement.

According to our findings, 53.2% of questionnaires scored 7. In other words, 33 (53.2%) respondents believed that the standards of this domain are being implemented excellently.

Sanaz Amirifar (2010) reported the rate of observance of standards of improvement to be equal to 31.6% in the emergency ward of a general hospital of Tehran University of Medical Sciences [18].

The findings of other similar studies do not corroborate those of our study, presumably due to the fact that those studies have dealt with one hospital only.

QPS: Our study indicated that 45.1% of QPS questionnaires scored 56-63, indicating that 30 (45.1%) respondents believe that the standards of QPS are being implemented excellently.

In a study by Turani *et al.* (2009) on hospitals of Iran University of Medical Sciences, the mean rates of observance of standards of quality improvement and patient safety were 72%, 57.6% and 57.4%. Among these, the hospital with an implemented EFQM excellence model had the highest score [19].

According to the findings of Raji Dargah *et al.* (2010), the patient safety of patients admitted in a specialized hospital of Tehran University of Medical Sciences was 68.16% [26].

Amirifar *et al.* (2010) conducted a study in the emergency department of a general hospital of Tehran University of Medical Sciences to report that only 31.6% of standards of quality improvement and patient safety were observed completely, while 44.9% were observed relatively and 23.5% were not observed at all [18].

Victor *et al.* evaluated the quality managers of 97 hospitals of intensive care in Ontario, Canada via email and concluded that expansion of capacity of quality improvement requires investments and education [27].

Although the authors faced limitations for comparing the results with those of international studies, comparison with Iranian studies indicates that our hospitals are in an intermediate level regarding quality improvement and patient safety. Furthermore, hospitals that use excellence models and systems of quality management demonstrate a better status.

CONCLUSION AND RECOMMENDATION

According to half (43.8%) of managers, the QPS standards are applicable in hospitals of Tehran University of Medical Sciences; however, their application requires greater efforts by the hospitals.

Implementation and actualization of standards in hospitals require certain infrastructures such as better knowledge on the part of managers regarding the principles and tools of quality improvement, training personnel about the standards, implementation of models of quality management and organizational excellence, reinforcing the public affairs in hospitals and using hospital information system (HIS) all of which influence the process of realization for standards of quality improvement and patient safety.

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