

## Original Article

## Designing a Quality Management Model for Health Services in Iran

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## ABSTRACT

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**Key words:**

Quality management;  
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 Quality assurance;  
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 Quality improvement

**Introduction:** Nowadays, the quality of services, especially in high volume clients, such as financial and care services, has become increasingly important. Therefore, quality of service in accordance with professional standards and customer expectations is important and a first step for it is a quality improvement.

**Objective:** The purpose of this study was to design a quality management model for providing health care in Iran.

**Method:** In this study, the comparative method was used to evaluate the health care quality indicators in selected countries (America-England-Japan-Malaysia-Egypt) and to compare their health care strategies. Hospital managers and people responsible for improving hospital quality in Iran have been involved in this research (377 questionnaire were analyzed). The study lasted from September 2018 to September 2019. Maxqda software was used to classify the adaptive variables. Maxqda software was used to classify the adaptive variables. LISREL software were used- Exploratory and confirmatory factor analysis- to identify the dimensions and validation of the mode .

**Results:** Twenty-four types of health care variables were identified from 6 countries. Exploratory factor analysis and questionnaire resulted in four general criteri: Quality Assurance, Quality Planning, Quality Control and Quality Improvement. Confirmatory factor analysis also showed that the identified dimensions are valid .

**Conclusion:** Considering that guarantee, control, planning and quality improvement have the highest impact respectively, continuous planning at the level of hospitals can lead to a significant increase in the quality of health care delivery .

**Introduction**

Each country's health system has four functions: sovereignty, finance, resource generation, and health services. Governments play a prominent role in the governance of the health system through policy, strategic planning, sovereignty and control. Due to the structure and culture of the country, various public and private organizations are involved in financing and providing health services. Controlling the health organizations and health services provided is the ultimate task of the Ministry of Health of each country. The

government is responsible for the health of the community and is responsible for creating and strengthening a responsive and effective health care system for people's health needs. The control process is carried out through various mechanisms such as inspection, monitoring, auditing, evaluation, evaluation and accreditation (1).

As the world evolves, businesses become overly competitive and can rapidly gain market share with evolving technology in order to refine their understanding of quality and to fault the product or service they produce. Maintain,

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compete and achieve their desired level. Comprehensive quality management can be defined as "the combination of collaborative management and teamwork, production of flawless products or customer satisfaction." Comprehensive quality management including quality-productivity and human communication involves a process that requires performance improvement at all levels and activities of each individual in the organization (2).

The health system is dependent on its components, no part more important than other parts in achieving better patient outcomes, so all components of the system must be considered to improvement and quality. Health is achieved through data. Without data, quality is not measurable. Quality of health requires training in the effective use of data through accurate data collection and analysis. According to Deming, the organization is made up of thousands of processes, so quality healthcare seeks to identify and track key processes and opportunities for quality improvement processes to initiate the intervention. Deming raises the issue of leadership commitment and states that without this commitment quality will not succeed. And in health this principle is partially true.

Leadership commitment is still important, but is not a necessity for quality health and success. Leaders can facilitate the process and achieve results faster, but the quality of health care needs to start at the employee level to produce positive results. Another feature of health care is the emphasis on patient perception. Numerous studies have examined the quality of health care provided by physicians and nurses. Medicine and high quality health care can be achieved by meeting patients' needs (3).

For example, a study conducted by Zarei et al in private hospitals in Tehran in 1990 aimed to evaluate the quality of services provided from patients' perspective. That was observed using the SERVQUAL questionnaire there was a major movement in the expected dimensions and perceptions of patients in service delivery, which was expected to bridge the gap between the services provided and the services expected of patients' satisfaction with service quality (4). Support senior management, effective human resources management, full participation in various business groups, teamwork and training groups, improving customer service, quality

management, customer focus and profit management.

Quality of health care includes features such as accessibility, cost-effectiveness, acceptance, adaptability, competence, timeliness, privacy, confidentiality, attention, care, accountability, accountability, accuracy, reliability, comprehensiveness, consistency, fairness, facilities and equipment. Ensuring safety and security, reducing mortality and morbidity, improving the quality of life and engaging patients are also key features. Donabedian defined the quality of medical services as "the application of medical science and technology in a way that maximizes its productivity to health without increasing risk". Coritt described the quality of care as "delivering care beyond patient expectations and achieving potential clinical outcomes with available resources". In this regard, Lehr said, "The quality of health care provided to individuals and populations increases the likelihood of providing the desired health and is consistent with current professional knowledge" (1).

Studies have shown that efforts to evaluate and improve quality in developing countries have focused on the structure, process, and ultimately results until 1995. The findings of recent years show that in 22 of the studies in developing countries there are generally no benchmarks, 7 studies on structural indicators and 12 studies on process indicators and 3 studies on both. An index and structure have been developed to evaluate the quality of care. The survey in Europe and the US shows attention to trends and results. In the United States, hospital mortality was used as an indicator of service quality. Studies on long-term indicators failed to address the impact of the program (6).

In Iran, the Ministry of Health and Medical Education has taken note of the importance of standardizing hospital management systems and has expanded the concept of evaluation to accreditation, and has focused on standardizing and evaluating hospital facilities. The Ministry of Health annually evaluates health care facilities using national Accreditation Standards and determines the degree of hospitals based on the standards being implemented. Hospital accreditation is the process of systematically evaluating and validating a hospital by an external organization using appropriate structural, process, and outcome standards (1).

Accreditation can lead to integration into health services management, providing banks with standardized hospital information in order to achieve process-related standards, health and safety outcomes, and health outcomes. Many developing countries use the accreditation model to measure the quality of their services, but few studies have examined the effects of its implementation on hospital quality management. The purpose of this study is to design a quality management model of health care in Iran using a comparative study performed on selected countries (US-UK-Japan-Malaysia-Egypt) and finally using statistical factor analysis methods extracted the final model.

### Research method

In this study, related models and variables have been identified for designing health care quality management model in Iran. It can be stated that since the researcher in this research has used both qualitative and quantitative methods, there is neither community nor sample in comparative research. Access to the statistical community and the individuals concerned was not possible. For this reason, using the content research method, the available documentation is reviewed. To gather information, Ministry of Health's website and their country performance reports, were used. In this study, the quality management variables of health services in the

United States of America, Egypt, Japan, and Malaysia have been studied.

In the quantitative parts of the study, the statistical population of the study includes all managers, experts in quality improvement, and responsible for health care units and support involved in the quality management process of hospitals in Iran. In the present study, considering the use of structural equation technique, the research variables are subdivided into questionnaires. At the time of preparation of the questionnaire the number of samples is determined by the number of questions. In this study, 24 variables were identified. The initial default for each question was at least 10 people. Due to the size of the population, this population is higher and about 400 samples are considered. Finally, 377 questionnaires remain for analysis.

In the qualitative part, according to comparative research, variables have been extracted. Then, using Maxqda software to explain the differences and similarities of variables. Twenty-four types of health variables were identified from the countries under study. SPSS software was used to determine the percentage and frequency of use of each quality variable in both studied countries and Iran.

The results of the frequency coding and percentages of health care quality are presented in Chart (1) and Table (2) respectively.

**Table1. Percentages of Quality Variables**

Category	Percent	Abundance
Acceptance	33. 33	6
Access	83. 33	5
suitable	50. 00	4
Capacity	33. 33	4
Competence or capability	66. 67	4
Continuity	16. 67	3
Effectiveness or improvement of health or clinical focus	100. 00	3
Efficiency	50. 00	3
Equality	33. 33	3
Patient focus or accountability	50. 00	3
Safety	50. 00	3
Sustainability	16. 67	2
Being on time	66. 67	2
Educational standardization	33. 33	2
Customer research	33. 33	2

Conferences	16. 67	1
Team work	16. 67	1
Projects Quality promotion	66. 67	1
Process reengineering	16. 67	1
Have regular management meetings	33. 33	1
Holding quality meetings	33. 33	1
Patient involvement	16. 67	1
Cost	66. 67	1
Acceptance	33. 33	6
Total	100	6

Table2.Frequency coding of Variables

Quality of Health Care	Iran	Malaysia	USA	UK	Japan	Egypt	SUM
Educational standardization		*	*			*	3
Teamwork	*	*	*				3
Quality promotion projects	*	*	*			*	4
Reengineering			*				1
Process of having continuous management meetings				*		*	2
Competence or capability				*			1
Being on time	*		*	*	*		4
Conferences						*	1
Effectiveness	*	*	*	*	*	*	6
Safety	*		*		*		3
Capacity	*			*			2
Quality meetings				*		*	2
Sustainable					*		1
Productivity	*		*	*			3
Equality		*	*				2
Accepting	*				*		2
Customer research			*				1
Continuity					*		1
Access	*	*	*	*	*		5
Facility-level key management processes						*	1
Appropriate	*	*			*		3
Patient accountability		*	*	*			3
Patient participation						*	1
Costs	*	*		*		*	4
SUM	11	9	12	10	8	9	59

Table3.Definition of Dimensions and Variables

<b>Dimensions of Quality Management</b>	<b>Definitions</b>
<b>Quality management</b>	The art of managing an organization is to achieve the best and excellence. Quality management comprises four main areas: quality planning, quality assurance, quality control and quality improvement (15)
<b>Planning</b>	It can play an important role in helping to prevent mistakes or identify hidden opportunities. Planning helps predict the future and build a somewhat conceivable future. It's the bridge between where we are and where we want to go. Planning looks to the future (10)
<b>Quality Assurance</b>	Regular and planned monitoring and evaluation are the various aspects of a project, service, system or device that maximize the likelihood of meeting the minimum quality standards in the manufacturing process. Quality assurance certainly cannot guarantee the production of quality (16).
<b>Quality Control</b>	Ensures the provision and production of goods and services in accordance with established standards or (achieving the desired characteristics of a product). For example, measuring or testing on a product or commodity to determine whether it meets the desired technical specifications (17)
<b>Quality Improvement</b>	Quality improvement involves systematic and continuous actions that lead to significant improvements in the health services and health status of target groups (1)

<b>Variables</b>	<b>Definition</b>
<b>Quality of Health Care</b>	Quality healthcare is defined as “consistently delighting the patient by providing efficacious, effective and efficient healthcare services according to the latest clinical guidelines and standards, which meet the patient's needs and satisfies providers(5).
<b>Educational standardization</b>	Appropriate criteria for educational planning in training personnel or patients in the health system (4).
<b>Teamwork</b>	Teamwork is defined as: Co-operation between those who are working on a task (9).
<b>Quality promotion projects</b>	Successful health promotion programmes/projects have been analysed with regard to their common characteristics. These characteristics have been generalized and then transformed into indicators of a successful health promotion. These characteristics have been generalized and then transformed into indicators of a successful health promotion (13).

<b>Reengineering</b>	This is a managerial-technical approach to improvement and focuses on the process, but believes in the need for large-scale, mutational change in organizations rather than minor changes and corrections (11).
<b>Process of having continuous management meetings</b>	Management team share projects. There is a drive through the continuous improvement co-ordinator and business unit process representatives. There are regular meetings. Through the focus teams - this helps communications and learning (17).
<b>Competence or capability</b>	Capability is the condition of having the capacity to do something and competence is the improved version of capability. ... Competency is the possession of the skills, knowledge and capacity to fulfil Current needs and capability focuses on the ability to develop and flex to meet Future needs (10).
<b>Being on time</b>	You do it right when you should (13).
<b>Conferences</b>	
<b>Effectiveness</b>	Adequate to accomplish a purpose; producing the intended or expected result (3).
<b>Safety</b>	Safety can also refer to the control of recognized hazards in order to achieve an acceptable level of risk (18).
<b>Capacity</b>	The total amount that can be contained or produced, someone's ability to do a particular (10).
<b>Quality meetings</b>	For reviewing products and services provided, and for developing policies and procedures related to maintaining high levels of productivity and customer satisfaction (19).
<b>Sustainable</b>	The concept of sustainability is composed of three pillars: economic, environmental, and social (4).
<b>Productivity</b>	The effectiveness of productive effort, as measured in terms of the rate of output per unit of input (5).
<b>Equality</b>	The state of being equal, especially in status, rights, or opportunities (19).
<b>Accepting</b>	Consent to receive or undertake (something offered) (12).
<b>Customer research</b>	Customer research is conducted so as to identify customer segments, needs, and behaviors.
<b>Continuity</b>	The unbroken and consistent existence or operation of something over time.
<b>Access</b>	The means or opportunity to approach or enter a place.
<b>Facility-level key management processes</b>	Is an activity that supports business operations in general and cannot be traced to individual units, batches or products (1).
<b>Appropriate</b>	Suitable or proper in the circumstances (9).
<b>Patient accountability</b>	Patients can have tremendous influence on disease and treatment outcomes if they work in conjunction with the provider's plan of care (19).
<b>Patient participation</b>	Patient participation in health technology assessment is an approach to quality which aims to

	include patients in the process of health care activity (16).
<b>Costs</b>	The actual costs of providing services related to the delivery of health care, including the costs of procedures, therapies, and medications (15).

Exploratory factor analysis (using LISREL software) was performed to identify and identify the initial model. To determine the amount of variance explained by analyzing research topics, commonalities were used. The initial model was distributed to the target population through the questionnaire, which included managers, experts and individuals involved in quality management of health care centers across the country.

For measuring the reliability of the questionnaire, Cronbach's alpha was used. Cronbach's alpha in this questionnaire was 0.896 which indicates that the questionnaire is reliable and the alpha obtained is not greater than 0.9 and indicates multiple linear questions are not. To prove the validity of the questionnaire, the viewpoints of health service quality management professors were used. Finally, the questionnaire had acceptable validity and reliability for use in the study. Due to the number of questionnaire questions and due to the high number of people involved in quality management of health services,

400 questionnaires were delivered to hospital managers and staff of quality improvement units that were randomly selected. Finally, 377 questionnaires were analyzed to extract the dimensions of the final model. In the next step, confirmatory factor analysis is used to validate the designed model.

### **Exploratory Factor Analysis (EFA)**

Exploratory factor analysis was performed to identify and identify the main factors and to discover and reveal specific features and relationships between them. To determine the variance of each index by analyzing the research subjects, commonalities were used. Initial subscriptions show all subscriptions before extraction, all of them equal to one. If the value of an item is less than 0.5, it will be excluded from the analysis. To determine the amount of variance explained by the factors in the subjects, the total variance explained by factor analysis was used.

The results are summarized in Table 4.

**Table4.** Percentage of total variance and agent specific values

Agents	Initial Eigenvalues	Initial Eigenvalues	Initial Eigenvalues						
	Total variance	Percent of variance Cumulative	Cumulative percentage of variance	Total variance	Percent of variance	Cumulative percentage of variance	Total variance	Percent of variance	Cumulative percentage of variance
1	7.449	31.039	31.039	7.449	31.039	31.039	5.887	24.530	24.530
2	3.462	14.423	45.462	3.462	14.423	45.462	3.870	16.125	40.655
3	2.236	9.317	54.779	2.236	9.317	54.779	2.630	10.958	51.613
4	1.152	4.800	59.579	1.152	4.800	59.579	1.912	7.966	59.579
5	.998	4.158	63.737						
6	.954	3.976	67.714						
7	.848	3.535	71.249						
8	.720	3.001	74.250						
9	.696	2.899	77.149						
10	.599	2.497	79.647						
11	.543	2.264	81.911						
12	.525	2.189	84.100						
13	.490	2.042	86.141						
14	.474	1.975	88.116						
15	.443	1.846	89.962						
16	.403	1.679	91.640						
17	.359	1.497	93.138						
18	.339	1.412	94.550						
19	.313	1.304	95.854						
20	.283	1.178	97.032						
21	.255	1.061	98.093						
22	.237	.985	99.078						
23	.123	.513	99.591						
24	.098	.409	100.000						

Table 3 shows the eigenvalues and variances corresponding to the factors. The purpose of the factor analysis is to explain the phenomena of interest with fewer initial variables.

First, the goal is to determine the number of factors to be kept in the analysis. According to the principles, factors must be maintained that have formal or theoretical validity. But before the rotation process, each factor cannot be well understood, so mathematical criteria such as the Kaiser criterion or Kettle's Scripting test are commonly used to hold the factors. Four factors were found to explain the variances. If

the obtained factors were rotated by Varimax method, the first factor accounted for 24.530%, the second factor 16.125%, the third factor 10.958% and the fourth factor 7.966% and 59.579% of the total variance respectively.

Confirmatory factor analysis of health care management quality dimensions four main factors (hidden variables) and 24 questions (visible variables) were used to measure the quality of health services. Each of these variables is represented by an index up to the figure. The results of factor analysis of health care quality management dimensions are



presented in Figure 4-6. The observational factor load in all cases is greater than 0.3. Also the t-value statistic is greater than 1.96,

indicating that the observed correlations are significant.

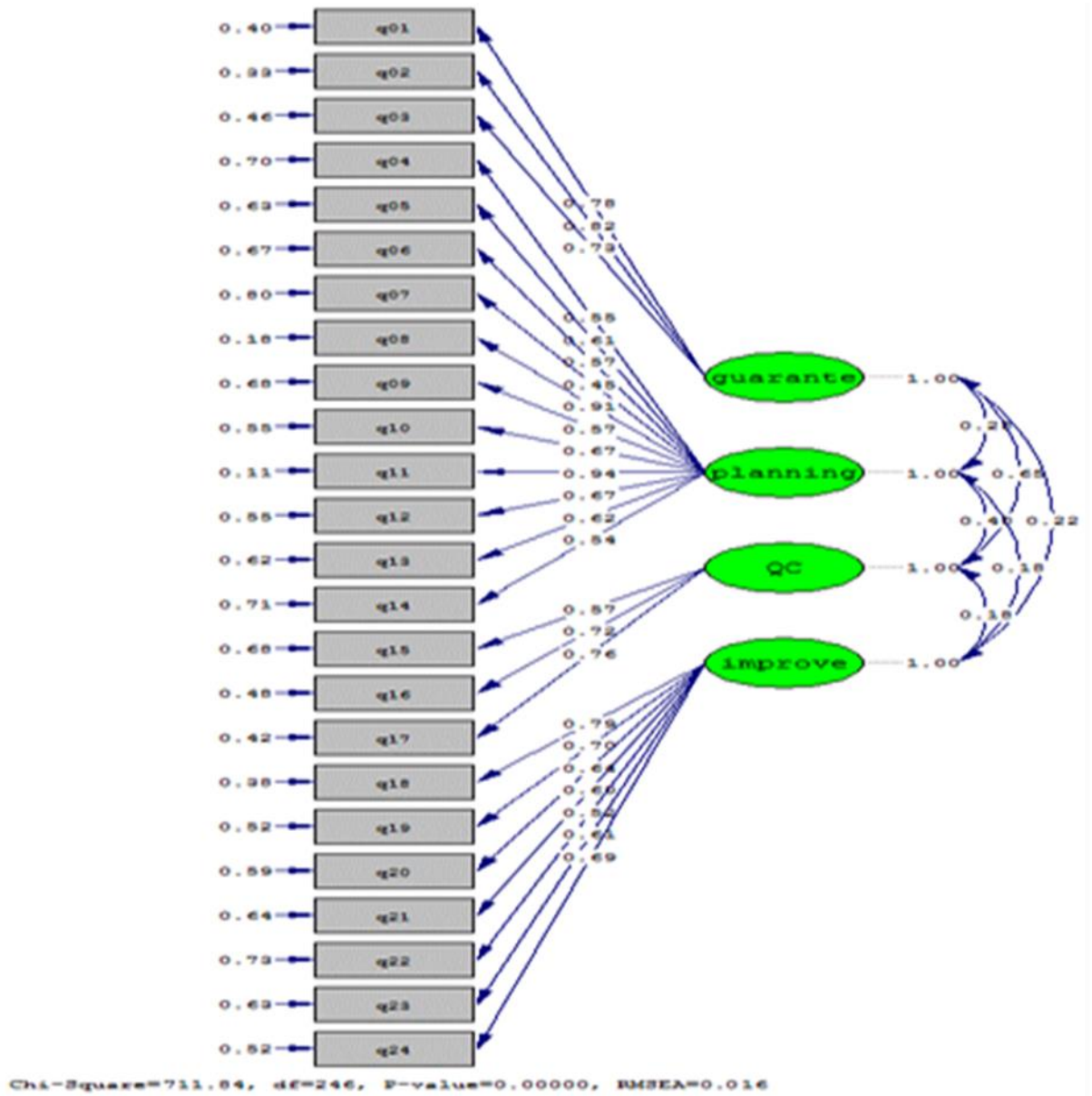


Figure 1. Standard factor loadings Confirmatory factor analysis of health service quality dimensions

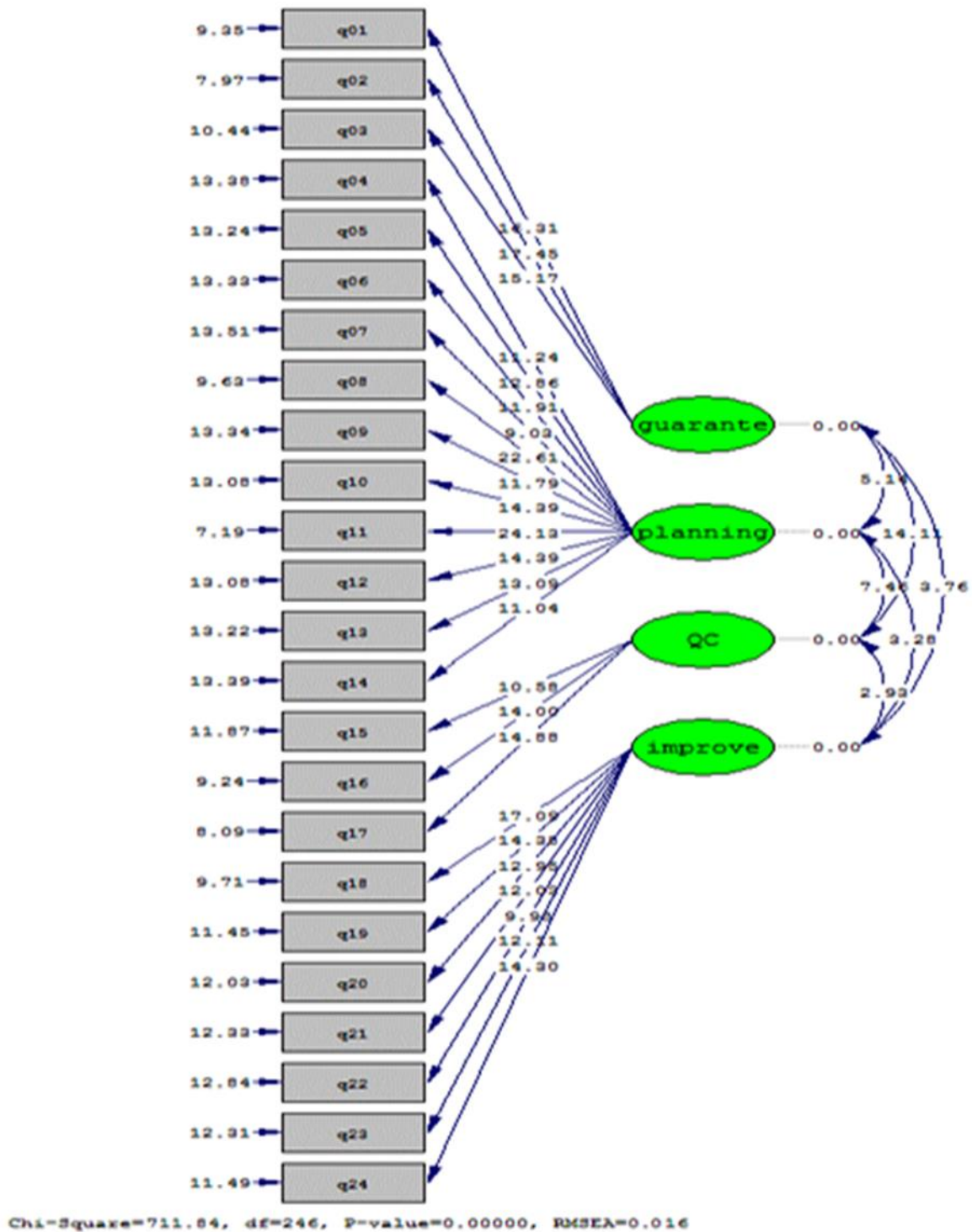


Figure 2. Statistical Value of t (Significant) Confirmatory Factor Analysis of Health Care Quality Dimensions

The next step is to Goodness of fit index in the model. One of the general indicators for calculating the free parameters in the calculation of the fit indicators, is the Xi-2 index which is calculated by the simple division of the Xi-2 on the degree of freedom of the model. If this value is between 1 and 5, it is

desirable. (7) In this study, X-two norms were obtained 2.89 .

The RMSEA index is also used as the Goodness of fit index in most confirmatory factor analyzes and structural equation models. If this index is less than 0.1 it is desirable. The RMSEA index was 0. 016, indicating that the model fits well.

## Discussion

Discussion: The health sector has not been immune to this quality revolution and much attention has been paid to evaluating and improving the quality of health services by patients and service providers, insurance institutions, legislators, policymakers and researchers. The results of the present study have identified 24 types of qualitative variables in the comparative study of the 6 countries under study. The United States has the most diversity in the 12 identified types of health services delivery with 12 types of variables equivalent to 50% of the 24 quality variables. Iran is the second most diversified provider with 11 types of variables in quality assessment of health services (45.8%) and Japan is the last with 8 types of variables equivalent to 33.3%.

Based on the results obtained in the dimension of health care quality management, planning including proportionality, capacity, focus or accountability, educational standardization, customer research, conferences, teamwork, process reengineering, key facility management processes, Having continuous management meetings and holding quality meetings; based on the results obtained; quality assurance included; acceptance; access; quality control dimension included; safety; quality improvement dimension included; effectiveness; improved health or clinical focus; productivity; Quality promotion projects have been costly.

Based on these results, Rouhani et al (8) showed that factors such as improvement of staff's job promotion system, increased patient support, improved patient acceptance, improved patient transfer between hospital wards, improved physician accountability to increase satisfaction could be Illness and progress Patient treatment and providing the necessary space for the patient's companions to stay, provide better hotel services to learners, etc. Hosseinpour et al. (9) showed that Accreditation independently influences the performance of internal organizations, so it is suggested that hospitals should focus more on accreditation criteria and standards.

Del Bahari and Abdi (10) showed that the most effective factor in implementing comprehensive quality management is staffing. The logic of this case can be assumed from existing theories. Because the discussion of

staff participation and teamwork and training of staff is one of the important issues in establishing comprehensive quality management in Hamadan University of Medical Sciences and Health Services.

Bahadori et al (11) showed that from the viewpoint of nurses, the effectiveness of Accreditation had an impact on the average quality of service. Linear regression analysis showed that leadership and quality management were identified as the most important predictors of quality validation.

Carasco et al. (12) showed that the establishment of comprehensive quality management in hospitals is only possible through the admission of senior managers and a medical team. Jazpal et al. (13) showed that clinical safety practices in hospital services are associated with low technical efficacy levels, no significant relationship was found between accessibility and technical efficacy, although it is highly effective in low infant mortality rates. Litchman et al. (14) showed that hospitals with higher quality ratings had lower mortality, more acceptance.

Based on comparative study and exploratory factor analysis, the model dimensions included 4 dimensions and 24 sub-criteria. The dimensions of quality management of health services in Iran include 11 indicators. The 13 indices differed from the countries under study. It was observed that: The severity of the effect of quality of care and quality assurance was calculated to be 0.72 and the probability statistic was 9.08 which is greater than the critical value of t at 5% error level of 1.96 and indicates that the observed effect is significant. Therefore, quality assurance is one of the factors that determine the quality of health care services.

The severity of the effect of quality of health care and quality planning was calculated to be 0.44 and the probability statistic was 6.20 which is greater than the critical value of t at 5% error level of 1.96 and indicates that the observed effect is significant. Therefore, quality planning is one of the determinants of the quality of health care services.

The severity of the effect of quality control was calculated to be 0.89 and the probability statistic was 8.12 which is greater than the critical value of t at 5% error rate (1.96) and shows a significant effect. Therefore, quality control is one of the factors that determine the quality of health services.

The severity of the effect of improving quality of care and quality improvement was calculated to be 0.26 and the probability statistic was 3.89 which is greater than the critical value of t at the 5% error level (1.96) and shows a significant effect. Therefore, quality improvement is one of the determinants of the quality of health care services

Table 5. Effective Variables in Dimension of Health Service Quality Management Planning and definition

Fit quality planning
Capacity
Patient center or patient focus or accountability
Educational standardization
Customer research
Conferences
Teamwork
Process reengineering
Key management processes
Have regular management meetings
Holding quality meetings

Table6. Effective variables in dimension of Quality Assurance

Acceptance
Access
Equality

Table7. Effective variables in Dimension of Health Care Quality Control

Competence or capability
Continuity
Safety

Table8. Effective Variables in Dimension of Service Quality

Effectiveness or improvement of health or clinical focus Efficiency
Sustainability
Being on time
Quality promotion projects
Patient participation
Cost

Based on the results achieved the dimension of health service quality planning including proportionality, capacity, patient center or patient focus or accountability, educational

standardization, customer research, conferences, teamwork, process reengineering, key management processes At the facility level, having continuous management meetings and holding quality meetings; based on the results of quality assurance dimension included, acceptance and access; quality control dimension included, safety; dimension of quality improvement included, effectiveness or improvement of health or clinical focus, productivity, Timely, quality improvement projects have been cost effective.

### Conclusion

Considering the results of the present study, in view of the current situation in Iran, selecting a successful deployment model, to establish the dimensions of quality management model at the level of the Ministry of Behavior and Therapy, and after successful deployment, provide a quality assurance tool with respect to the variables extracted in each dimension It can be effective in improving the quality of health care delivery.

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