

A comparative study between the performance of ISO 9001 certified and non-certified hospitals and health care centers: The case of Tehran province

Atoosa Forough, Changiz Valmohammadi*

Islamic Azad University, Alborz Science & Research Branch, Faculty of Management and
Accounting, Alborz, Iran

*E-mail: valmohammadi@yahoo.com

Received for publication: 17 May 2015.

Accepted for publication: 10 August 2015.

Abstract

Based on the increasing interest of the hospitals and health care centers to acquire the ISO 9001 certification and to implement this standard to enhance the quality of services they provide for their patients, the main objective of this study was to compare the relative performances of the certified hospitals and health care centers with the non-certified ones as a case study within the Tehran province, Iran. For this purpose, a field survey questionnaire was designed to collect information required for the assessment of the statistical significant differences between the performances of the two mentioned groups of hospitals and health care centers. The obtained results revealed that the ISO 9001 certified hospitals and health care centers outperform the non-certified ones regarding the fast respond to the customers, flexibility of the employee's operation, quality design, customer satisfaction as well as the employee's satisfaction. Based on the results, it was concluded that the non-certified hospitals and health care centers, in order to enhance the quality of their services which eventually would lead to the higher level of customer satisfaction, must obtain the mentioned certificate to effectively implement the ISO 9001 standard.

Keywords: Hospital, Health care centers, Patients.

Introduction

In hospitals and health care centers, in terms of service type and dealing with human health, improving the quality and ensuring of it are considered constantly and increasingly. And by paying taxes and bearing the costs of health care, people expect to receive good and high quality services from hospitals and health care centers.

Hospitals and health care centers are searching for acceptance and observance of professional standards to obtain credit. In some countries, standard acceptance are done mandatory and in some cases, optional. The motivation to standard acquiring can be different in the fields of economic requirements, such as pre-requisite for the contract to personal interests and specialist hospitals and health care centers to work in accordance with accepted standards.

By considering the current state of health care centers in our country and current state of providing health care, taking advantage of more modern management practices to improve the quality and performance improvement is needed more than ever. The organizations that follow the framework and method for improving their quality and performance can use many options. Determining an appropriate model due to the needs of an organization is one of the basic steps to improving the performance and quality. The approach with standards series ISO 9001 is based on this belief that quality management is the supplement of routine activities and current methods in health and care system. Its main objective is to reach satisfactory results for patient treatment by

controlling the process leading to treatment. Generally, the method to reach this objective is to prevent the occurrence of adverse outcomes in all stages of service delivery and most emphasis is on how to run and manage the process.(Noorbakhsh,2000)

Management quality, coordinated activities and controlling an organization in terms of quality, direction and control from the view of quality include generally the establishment of a quality policy and quality objectives. Quality planning, quality control, quality assurance and quality improvement are considered in this part.(valmohammadi,2003) The purpose of quality management is to create a culture or process in which process and operations and process are implemented for the first time, fully and efficient.(valmohammadi,2011)

Quality management in health and care sector, with regard to the principles of justice and respect for patients, patient's satisfaction and employee satisfaction provides new horizons for the social service system. Especially, it is a pioneer of Quality Management System that this attention is not considered only the practical aspect, but also all theoretical aspects.(Tayebi et al,2002)

Now, a wide range of measures at hospitals and health care centers are begun to implement and maintain the quality management system based on ISO 9001 standards or it is under way.

It is obvious that valuable records of this set in the context of quality assurance services are noticeable in establishing an appropriate area to create this change. So, it is expected that health and community could move as a coordinated and coherent way to identify and establish the international standards.

Although in health filed in our country, using standards in general and in hospitals and health care centers are the concepts that have recently been raised more seriously. But with the approach of new structure of health in country, not only it makes necessary to process it according to the essential requirements, but also it is a national need. And with the strong determination of policy makers and NGOs, we can hope that in the not too distant future, we will see the fundamental changes to improve the situation of health system structure and within its heart, we can see the health and care system. So, we will move toward the all providers of this global movement and followed by the ministry of health plan, we can move step by step to standardizing the hospitals and health care centers. In this regard, there are researches about investigating the effects of ISO 9001 certification in hospitals at home and abroad and we can infer to the following cases:

Tofighi conducted a research entitled "Comparative analysis of hospital standards of MOH with the principles of ISO 9000 version 1994". (Tofighi, 1397) In an article entitled "investigating and analyzing the effective factors of patient satisfaction from the quality of hospital services, case study: public hospital in Mashhad" which was done by Mostafa Kazemi and Saiide Fonodi. The various parameters that influenced on patient satisfaction in hospital, were analyzed and evaluated.(Kazemi & Fonodi,2009) An article entitled " the amount of patient's satisfaction in type 1 hospital of Tehran University of Medical Sciences, Tehran University of Medical Sciences of Medicine" which was done by Batool Ahmadi and Maryam zivdar. And he reached to a relative patient satisfaction in studied hospital.(Ahmadi & Zivdar,2010) Another article entitled " Job satisfaction and related factors with it among the employees of Arak's hospital" which was done by Farzaneh Jahani, Ali Asghar Farazi, Mohammad Rafii, Rahmat Allah Jadidi and Zohre Anbari and total satisfaction of individuals from the studied hospital was moderate. (Jahani et al,2010) An article entitled "effective factors on the referrer's satisfaction to the emergency part of Imam Khomeini (RA) hospital in Tabriz" which was done in 2012 by Hassan Soleiman pour, Changiz Gholipouri, Shaker Salari Lak, Payam Rayoufi, Rozbeh Rajaii fafori, Mahbob pour aghaii and Maryam Soleiman pour and the findings showed that the referrers were satisfied, relatively from the provided services. (Soleimanpour et al, 2012) Also, Valmohammadi and Khoda Panahi in an article entitled " ISO 9001:2000 implementation effects on employee's Job satisfaction", showed that focus

on customer, training, empowerment, teamwork and continuous improvement of staff all of them are directly related with their job satisfaction. (Valmohammadi & khodapanahi , 2011) .

Some articles that are done in this context abroad, we can infer to an article entitled “ ISO 9001 certification in a hospital of Cornea bank “ which has been published in 2002. Among other articles that can be noted are “ the benefits of ISO 9001 certification: case study of regional hospital in Switzerland”. And in it, the special benefits after ISO 9001 certification are mentioned. (Pascale et al , 2002) In another article titled “ISO quality management system in a hospital: only benefits or bureaucracy?” which was written in 2005. It was described that how a Red Cross hospital in Netherlands can implements the quality management ISO9000 system across your organization. (Jaap van den et al , 2005) also in an article entitled “the implementation of a quality management according to ISO9001 standard in one hospital in a home unit” which was written in 2010. It was explained that the purpose of this article is to describe the changes and obtained results after implementing the quality management system due to ISO standard in a hospital in home unit. (Matilde et al , 2010) In 2012, an article entitled “evaluation the quality management system implementation by international standard Organization (ISO) in the field of medicine: a study of a training hospital” was published and it investigates the effect of the implementation of ISO quality management system in training organization in Taiwan center. (Tsung-Po et al , 2012)

Conducted studies forced the researcher to investigate the performance of hospitals and health care centers which are certified ISO 9001 and hospitals and health care centers without ISO 9001 generally and the purpose of researcher, in addition to developing the ISO application among organizations as the hospital services parts. Checking the status of desired organizations performance and comparing them is for investigating that they have ISO 9001 certification or not:

Whether organization that are ISO 9001 certified has a better performance or having ISO 9001 certification improves the performance?

According to the above information, research hypotheses were as follows:

The First Hypothesis: “ Response speed in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

The second Hypothesis: “ operational flexibility in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

The third Hypothesis: “ design quality in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

The fourth Hypothesis: “ customer satisfaction in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

The fifth Hypothesis: “ employee satisfaction in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

Research Method

This research is a descriptive, inferential and its implementation is in field method and in terms of objective, it is placed in the framework of application research.

The statistical population of this research will be divided into two groups:

1) The statistical population of hospitals and health care centers without ISO 9001 certification in Tehran Province

2) The statistical population of hospitals and health care center with ISO 9001 certification in Tehran Province

Despite extensive study to obtain detailed information from the statistical population, there was no authoritative reference for incorporating these information. Despite, reference to the Ministry of Health and Medical education of Tehran Province and inquiring from witness companies that have the most activity in the field of health and care and also reference to site databases of hospitals and health care centers in Tehran Province, it was found that there are 136 hospital and health care centers in Tehran Province and 9 hospitals were identified with ISO9001 certification. And researcher considers is as the statistical population of hospitals and health care centers with ISO 9001 certification. And the rest of them were considered as statistical population of hospitals and health care center without ISO 9001 certification in this research.

To determine the sample size of employees and customers for two groups without and with ISO 9001 certification, it is done as follows:

$$n_1 = \frac{(1.96)^2 \times (0.50)(0.50)}{(0.08)^2} = \frac{.96}{.0064} = 150 \quad \rightarrow \quad n = \frac{(Z_{1-\frac{\alpha}{2}})^2 \times Pq}{(d)^2}$$

According to estimations ($P=0/5$, $d=0/08$ and reliability coefficient ($0/95$)), 150 people were considered as sample size of each of customers and employees of hospitals and health care centers with and without ISO 9001 certification. Information collection method in this research is in type of library, field, internet and using questionnaire. One of the most popular tolls in descriptive research in field method is using a questionnaire. So, in this research, a questionnaire was used as close and direct form of data collection from refers and staffs of hospital and health care center.

For data gathering, a questionnaire consists of 44 questions derived from five hypothesis were used as independent variables (response speed, performance flexibility, design quality, customer satisfaction, employee satisfaction). And they were designed and justified.

7 questions about independent variable of response speed, 10 questions about independent variable of customer satisfaction, 12 questions about independent variable of employee satisfaction, 3 questions about independent variable of the operational flexibility and 12 questions related to independent variable of design quality of hospitals and health care center.

For each of 44 questions in the questionnaire, five main options “too high”, “high”, “medium”, “low”, “very low” are used. And it measured the internal attitude of users and staffs. So, general description about the purpose of study, how to fill out the questionnaire and confidentially were given to all respondents. To determine the reliability of questionnaire.

in this research, the Cronbach’s alpha was used. For this purpose, a sample of 38 workers, of a center without ISO9001 certification, a sample of 38 people of center with ISO9001 certification, a 38 people sample among the customers of a center without ISO9001 certification and finally a sample with 38 customers of a center with ISO9001 certification were selected and the questionnaire of this research was given to all of them. And after data collection, SPSS Cronbach’s alpha for all the questions associated with each of the above examples were calculated and the obtained results are as follows:

The Cronbach’s alpha for the customer’s questionnaire of centers with ISO 9001 certification was equal to $0/831$, and for the customer’s questionnaire of center without ISO 9001 certification was equal to $0/805$, for employees’ questionnaire of centers with ISO 9001 certification was equal $0/851$ and for the employees questionnaire without ISO 9001 certification, it was equal to $0/837$. Because the alpha values are mostly in an appropriate limit and they have been achieved more than 70% . So, we can concluded that reliability (credit) of the questionnaire is largely guaranteed and the effect of chance and random in measuring the test variable isn’t notable. The validity and reliability of this test was verified by the professors and experts.

To data analysis, first the questions of research were entered to SPSS21 statistical software. Then, data were analyzed by using descriptive and inferential method by using comparison methods of mean difference. Thus, at first, all hypotheses from first to fifth were tested by using descriptive method. In the next stage, all these hypotheses were investigated by using analytic method and by using mean difference test (Independent Samples T Test). In the mean difference comparison test, it is assumed that two separate sets of frequencies are obtained in different circumstances but by a similar experiment. And we should test, that whether the results of experiments related to these two sets of frequencies can be significantly different from each other or not?

So, H_0 hypothesis is set against the hypothesis H_1 for each variable as follows:

$$H_0 : \mu_1 \geq \mu_2$$

$$H_1 : \mu_1 < \mu_2$$

That in the present study,

μ_1 : moderate limit about each hypothesis in centers without ISO

μ_2 : moderate limit about each hypothesis in centers with ISO

if the calculated amount for t from obtained value of it, t will be larger or equal with it, hypothesis H_0 is rejected.

Results

About 600 questionnaires (150 questionnaire for each of the employees and customers of hospitals and health care centers with ISO 9001 certification and without ISO9001 certification) were distributed.

Descriptive analysis of data

In the first part, 5 hypotheses related to each of the independent variables were investigated by using descriptive method (frequency determining and calculating the mean).

The First Hypothesis

“ Response speed in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

Accordingly, 7 questions of questionnaire have been allocated to this hypothesis that all of them were answered by the customers of hospitals and health care centers and with and without the ISO 9001 certification. The final mean of scoring to questions related to variable “response speed” by the customers of hospitals and health care centers with ISO9001 certification with the amount of 3/05 is higher than the customers of hospitals and health care centers without these certifications with the amount of 2/69 and it is more with 0/81 amount. These differences may indicate a relative increase in response rate in hospitals and health care centers with ISO 9001 certifications than the hospitals and health care centers without these certifications.

The second Hypothesis

“Operational flexibility in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

According to this issue, 3 questions of this questionnaire was allocated to this hypothesis and all of them were responded by the staffs of hospitals and health and treatment centers with and without the ISO 9001 certification. The final mean of scoring to the questions was related to “operational flexibility” by the staffs of hospitals and health care centers with the ISO 9001 certification with the amount of 3/48 is more than other hospital’s employees and health care centers without this certification with the amount of 2/08 is larger with 0/68 factor. This difference can show the relative increase of operational flexibility in hospitals and health care centers with ISO 9001 certification relative to other hospitals and health care centers without this certification.

The third Hypothesis

“ Design quality in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

According to this issue, 12 questions of questionnaire were allocated to this hypothesis and all of them were answered by the staffs of hospitals and health care centers with and without ISO 9001 certification. The final mean of scoring to the related questions to variable “design quality” by the employers of hospitals and health care centers with ISO 9001 certification with the value 3/49 is more than the employees of hospitals and health care centers without this certification with the value 2/56 is more with 0.93 value. These differences can show the relative increase of design quality in hospitals and health care centers with ISO 9001 certification in compare with hospitals and health care centers without this certification.

The fourth Hypothesis

“ Customer satisfaction in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

Accordingly, 10 questions of the questionnaire were allocated to this hypothesis that all of the questions were answered by the customers of hospitals and health care centers with and without ISO 9001 certification. The final mean of scoring to the questions related to the variable of “customer satisfaction” by the customers of hospitals and health care centers with ISO9001 certification with the value of 3/52 relative to the customers of hospitals and health care centers without these certifications with the amount of 2/66, is more with 0/86 value. This difference can show the relative increase of customer satisfaction in hospitals and health care centers with ISO 9001 certification in compare with hospitals and health care systems without this certification.

The fifth Hypothesis

“ Employee satisfaction in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

Accordingly, 12 questions of the questionnaire were allocated to this hypothesis that all of them were answered by the employees of hospitals and health care centers with and without ISO 9001 certification. The final mean of scoring to questions related to a variable “employee satisfaction” by the employees of hospitals and health and treatment service centers with ISO 9001 certification is with 3/65 value in compare with the hospital’s staffs and health care centers without these certification with the value 2/62 is more than the former with 1/30. This difference can shows the more job satisfaction of employees in hospitals and health care centers with ISO 9001 certification than hospitals and health care service centers without these certifications.

Inferential analysis of data

In the second part, 5 hypotheses related to each of the independent variables were studied (T-test) by using inferential statistic.

Inferential analysis of data related to the first hypothesis

$$H_0 : \mu_1 \geq \mu_2$$

μ_1 : response speed in hospitals and health care centers without ISO

μ_2 response speed in hospitals and health care centers with ISO

Based on the analysis of comparing the mean differences by using T(Independent Samples T Test) test on opinions of respondent customers in hospitals and health care centers with ISO and hospitals and health care centers without ISO and according to the output of the SPSS software which are given in table 1, it was found that T value for the mean of all questions related to first hypothesis is equal to 16/327 and degrees of freedom (df) is equal to 298. Since the calculated T

value (16/327) related to T value is larger than obtained value from table (1/64), so the H_0 hypothesis is rejected and H_1 is accepted. Another method to accept or reject the H_0 hypothesis, is the Test Statistic table. According to this issue that based on the output of SPSS software, the equivalent value was 0/00 and is less than $\alpha=0/05$. So, again we can conclude that H_0 hypothesis is rejected and H_1 hypothesis is accepted. Accordingly, the “response speed of hospitals and health care centers with ISO 9001 certification is more than hospitals and health care centers without this certification.”

Table 1- Inferential analysis of data related to the variable " response speed "

Group Statistics					
	iso	N	Mean	Std. Deviation	Std. Error Mean
Response speed	With ISO	150	3.4875	0.36700	0.02997
	Without ISO	150	2.6771	0.48455	0.03956

$H_1 : \mu_1 < \mu_2$										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower		Upper
Response speed	Equal variances assumed	13.534	0.000	16.327	298	0.000	0.81033	0.04963	0.71266	0.90800
	Equal variances not assumed			16.327	277.623	0.000	0.81033	0.04963	0.71263	0.90803

Inferential analysis of data related to the second hypothesis

$$H_0 : \mu_1 \geq \mu_2$$

$$H_1 : \mu_1 < \mu_2$$

μ_1 : Operational flexibility in hospitals and health care centers without ISO

μ_2 : Operational flexibility in hospitals and health care centers with ISO

Based on comparative mean analysis by using T test (Independent Samples T Test) on the opinions of respondents employees in the hospitals and health care centers with ISO and hospitals and health service care and without ISO and according to the output of SPSS software are gathered in table 2. And it was specified that T value for the mean of all questions related to the second hypothesis is equal to 12/623 and its degree of freedom (df) is equal to 298. Since the calculated T value (12/623) in compare with T value of table (1/64) is larger, so the H_0 hypothesis is rejected and H_1 hypothesis is accepted. Another method to accept or reject the H_0 hypothesis, is the Test Statistic table. According to this issue that based on the output of SPSS software, the equivalent value was 0/00 and is less than $\alpha=0/05$. So, again we can conclude that H_0 hypothesis is rejected and H_1 hypothesis is accepted. Accordingly, the “Operational flexibility of hospitals and health

care centers with ISO 9001 certification is more than hospitals and health care centers without this certification.”

Table 2- Inferential analysis of data related to the variable " Operational flexibility "

Group Statistics										
		Iso	N	Mean	Std. Deviation	Std. Error Mean				
Operational flexibility	With ISO		150	3.4645	0.47317	0.03863				
	Without ISO		150	2.7887	0.45404	0.03707				

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
Operational flexibility	Equal variances assumed	0.333	0.564	12.623	298	0.000	0.67587	0.5354	0.57049	0.78124	
	Equal variances not assumed			12.623	297.494	0.000	0.67587	0.5354	0.57049	0.78124	

Inferential analysis of data related to the third hypothesis

$$H_0 : \mu_1 \geq \mu_2$$

$$H_1 : \mu_1 < \mu_2$$

μ_1 : Design quality in hospitals and health care centers without ISO

μ_2 : Design quality in hospitals and health care centers with ISO

Based on the mean comparative analysis by using T test (Independent Samples T Test) on the opinions of respondents employees in hospitals and health care centers with ISO and hospitals and health care centers without ISO and the results of SPSS software are given in table 3. It was determined that T value for the average of all questions related to third question was equal to 23/409 and degree of freedom (df) was equal to 298. Since the value of calculated T (23/409) is larger than the T value obtained from table (1/64), so the H0 hypothesis is rejected and H1 hypothesis is accepted. Another method to accept or reject the H0 hypothesis, is the Test Statistic table. According to this issue that based on the output of SPSS software, the equivalent value was 0/00 and is less than $\alpha=0/05$. So, again we can conclude that H0 hypothesis is rejected and H1 hypothesis is accepted. Accordingly, the “Design quality of hospitals and health care centers with ISO 9001 certification is more than hospitals and health care centers without this certification.”

Table 3- Inferential analysis of data related to the variable " Design quality "

Group Statistics									
		iso	N	Mean	Std. Deviation	Std. Error Mean			
Design quality	With ISO		150	3.4824	.34498	.02817			
	Without ISO		150	2.5489	.34575	.02823			

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
Design quality	Equal variances assumed	.056	.814	23.409	298	.000	.93353	.03988	.85505	1.01201	
	Equal variances not assumed			23.409	297.999	.000	.93353	.03988	.85505	1.01201	

Inferential analysis of data related to the fourth hypothesis

$$H_0 : \mu_1 \geq \mu_2$$

$$H_1 : \mu_1 < \mu_2$$

μ_1 : Customer satisfaction in hospitals and health care centers without ISO

μ_2 : Customer satisfaction in hospitals and health care centers with ISO

Based on the analysis of mean differences and by using T test on the opinions of respondents customers in hospitals and health care centers with ISO and hospitals and health care centers without ISO and due to the outputs of SPSS software are given in table 4. It was obtained that T vale for all the averages of questions related to fourth hypothesis is equal to 17/477 and degree freedom (df) is equal to 298. Since the calculated value of T is (17/477) and it is larger than the obtained T from the table (1/64), so the H_0 hypothesis is rejected and H_1 hypothesis is accepted. Another method to accept or reject the H_0 hypothesis, is the Test Statistic table. According to this issue that based on the output of SPSS software, the equivalent value was 0/00 and is less than $\alpha=0/05$. So, again we can conclude that H_0 hypothesis is rejected and H_1 hypothesis is accepted. Accordingly, the "Customer satisfaction of hospitals and health care centers with ISO 9001 certification is more than hospitals and health care centers without this certification."

Inferential analysis of data related to the fifth hypothesis

$$H_0 : \mu_1 \geq \mu_2$$

$$H_1 : \mu_1 < \mu_2$$

μ_1 : Employee satisfaction in hospitals and health care centers without ISO

μ_2 : Employee satisfaction in hospitals and health care centers with ISO

Based on the analysis of mean difference comparison and by using T test (Independent Samples T Test) on the opinions of respondents in hospitals and health care centers with ISO and health care centers without ISO and according to SPSS software are given in table 4, it was determined that T value for the average of all questions related to fifth hypothesis is equal to 26/395 and its degree of freedom (df) is equal to 298. Since the T calculated value is (26/395) and is larger than T value in table (1/64), so the H_0 hypothesis is rejected and H_1 hypothesis is accepted. Another method to accept or reject the H_0 hypothesis, is the Test Statistic table. According to this issue that

based on the output of SPSS software, the equivalent value was 0/00 and is less than $\alpha=0/05$. So, again we can conclude that H0 hypothesis is rejected and H1 hypothesis is accepted. Accordingly, the “Employee satisfaction of hospitals and health care centers with ISO 9001 certification is more than hospitals and health care centers without this certification.”

Table 4- Inferential analysis of data related to the variable " Customer satisfaction "

Group Statistics										
		Iso	N	Mean	Std. Deviation	Std. Error Mean				
Customer satisfaction	With ISO		150	3.5087	.44540	.03637				
	Without ISO		150	2.6493	.40529	.03309				

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower		Upper
Customer satisfaction	Equal variances assumed	.248	.619	17.477	298	.000	.85933	.04917	.76257	.95610
	Equal variances not assumed			17.477	295.385	.000	.85933	.04917	.76257	.95610

Table 5- Inferential analysis of data related to the variable " Employee satisfaction "

Group Statistics										
		Iso	N	Mean	Std. Deviation	Std. Error Mean				
Employee satisfaction	With ISO		150	3.5087	.44540	.03637				
	Without ISO		150	2.6493	.40529	.03309				

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower		Upper
Employee satisfaction	Equal variances assumed	.248	.619	26.395	298	.000	.85933	.04917	.76257	.95610
	Equal variances not assumed			26.395	295.385	.000	.85933	.04917	.76257	.95610

Discussion and Conclusion

According to this issue that in the present study, 5 dependent variable including response time, operational flexibility, design quality, customer satisfaction and employee satisfaction which is

an indicator of performance, these variables were used to evaluate and compare the performance of hospitals and health care centers with ISO9001 certification and health care centers without this certifications. After analyzing the statistical data and hypothesis test and determining the relation between data, the following results were obtained:

the obtained results of both methods of descriptive method (means) and inferential method (Independent Samples T Test) show that hospital performance and health care centers with ISO 9001 certification about the variables have a significant difference than hospitals and health care centers without ISO9001 certification, and hospitals and health care centers with ISO9001 certification have a higher performance than other hospitals and health care centers without ISO9001 certification.

Obtained conclusion from the first hypothesis

The First Hypothesis: “ Response speed in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

Accordingly, 7 questions of questionnaire were allocated to this hypothesis and all of them were answered by the customers of hospitals and health care centers with and without ISO9001 certification. According to the obtained results of both descriptive and inferential methods, it seems that by rejecting H_0 hypothesis and with 95% confidence level, the respondents believe that the performance of hospitals and health care centers with ISO9001 certification about the response speed, so answering to customers relative to hospitals and health care centers without ISO9001 certification is more significant.

Also in an article entitled “analyzing the effective factors of patient’s satisfactions of the quality of hospital services (case study: public hospital in Mashhad”) which was conducted in 2009 by Kazemi and Fonodi. The factors which are used in the present study for the variables of response speed and design quality were used to measure the patient’s satisfaction and this result was obtained that the effects of factors related to the response speed variable on the amount of patient satisfaction is desirable. And related factors to the variable of design quality of the amount of patient’s satisfaction are average effective. This issue shows the first hypothesis of research about response speed, third hypothesis about operational flexibility and fourth hypothesis about the customer satisfaction. (kazemi & fonodi,2009)

Obtained conclusion from the second hypothesis

The second Hypothesis : “ Operational flexibility in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

Accordingly, 3 questions of questionnaire were allocated to this hypothesis and all of them were answered by the employee of hospitals and health care centers with and without ISO9001 certification . According to the obtained results of both inferential and descriptive method, it can be assumed that by rejecting H_0 hypothesis with 95% confidence level, the respondents believe that the performance of hospitals and health care centers with ISO9001 certification about operational flexibility is significantly higher than hospitals and health care centers without ISO9001 certification.

Also, the obtained results in an article entitled “the effects of ISO9001:2000 implementation on employees job satisfaction” that was conducted in the year of 2011 by Valmahdi and Khodapanahi showed that focus on customer, training, empowerment, teamwork, continuous improvement of staff is directly related with their job satisfaction. In addition to confirm the fifth hypothesis, this research in the field of employees’ satisfaction, show the second hypothesis of this research in the field of operational flexibility. (Valmohammadi and khodapanahi, 2011)

Obtained conclusion from the third hypothesis

The third Hypothesis: “ Design quality in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

Accordingly, 12 questions of questionnaire were allocated to this hypothesis and all of them were answered by the employee of hospitals and health care centers with and without ISO9001 certification . According to the obtained results of both descriptive and inferential, it is concluded that by rejecting H_0 hypothesis with 95% confidence, respondents believe that the performance of hospitals and health care centers with ISO9001 certification about the design quality is more significant than hospitals and health care systems without ISO9001 certification.

Obtained conclusion from the fourth hypothesis

The fourth Hypothesis : “ Customer satisfaction in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

Accordingly, 10 questions of questionnaire were allocated to this hypothesis and all of them were answered by the customers of hospitals and health care centers with and without ISO9001 certification. According to the obtained results of both descriptive and inferential method, it is believed that by rejecting hypothesis H_0 with 95% confidence, the respondents believe that the performance of hospitals and health care centers with ISO9001 certification about customer's satisfaction is significantly higher than customer's satisfaction than hospitals and health care centers without ISO9001 certification. Also the obtained results of an article entitled “effective factors on the satisfaction of referrers to Emergency Department of Imam Khomeini (RA) in Tabriz” and it was written in 2011 by Soleiman pour and others and it indicates this issue that the amount of satisfaction of referrers of this hospital has been partially satisfactory. (Soleimanpour et al, 2012)

Obtained conclusion from the fifth hypothesis

The fifth Hypothesis : “ Employee satisfaction in hospitals and health care centers, which have ISO 9001 certification is more than other hospitals and health care centers without this certification.”

Accordingly, 3 questions of questionnaire were allocated to this hypothesis and all of them were answered by the employee of hospitals and health care centers with and without ISO9001 certification . According to the obtained results of both descriptive and inferential method, it can be say that by rejecting H_0 hypothesis with 95% confidence level, the respondents believe that the performance of hospitals and health care centers with ISO9001 certification about the employee's satisfaction of hospitals and health care centers without ISO9001 satisfaction is significantly higher. Also, the obtained results of an article entitled “Job satisfaction and related factors among employees of the hospitals of Arak province” which was written in 2009 by Jahani et al and shows this issue that staff's satisfaction in this hospital is moderate. (jahani et al, 2010) and in another research entitled “emergency nurses' job satisfaction and its effective factors among hospitals of martyr beheshti university of Medical sciences” that was conducted in 2011 by Forozanfar et al, and it was concluded that about 64 percent of nurses are satisfied of their jobs.(foroozanfar et al, 2013)

Suggestions based on research findings

After investigating the obtained results of data analysis and according to the results of research's hypothesis test that lead to confirm all the hypothesis, hospitals and health care centers (in Tehran) can improve their performance due to the considered dimensions and components in the research. In this context, we can refer to the following operations:

-make aware the hospitals and health care centers about the benefits of system certification of ISO quality management and a help of this standard which can be used to improve the affairs among organizations.

-give awareness to hospitals and health care centers in order that by proper implementation of this quality system, they can move with the today science in the field of management and in this field they can compete with hospitals and health care centers inside or outside the country to take a step towards progress.

-as it was clear from the findings of this research's hypothesis, that the performance of hospitals and health care centers with ISO9001 certification is more than the performance of hospitals and health care centers without this certification. So of the centers without these certifications want to receive this certification, this issue can lead to increase the performance of hospitals and health care systems and help to improving the level of health in the country.

Other proposals in this field can be provided for hospitals and health care systems which are included the following:

- The number of staffs must be appropriate with size and scope of activities in hospitals and health care centers. The technical director is required to start the activity and introduce qualified personnel to carry out the technical, reception, laundry and cleaning affairs. Determining the workload for each of extent the employees to the extent that there is no adverse is the responsibility of technical responsible.

- Duties description, responsibilities and authorities of each of the employees that must be determined by technical director. These tasks should be consistent with the type of education and training of employees.

- At the beginning of the service assignments to each of their employees, they should understand them and also the range of activities, organizational hierarchy and their status should be explained to them.

- Scientific and technical competence of each of the hospital's employees with respect to the duties in addition to the beginning of service start, should be investigated periodically during the service time (at least every 6 months) to ensure the preservation of professional skills, and its documentations are available. (according to staff training).

- For defined roles and responsibilities of each of staff, an appropriate alternative should be determined and documented. These duties and responsibilities should be understood by the alternative person.

- Founder and technical director of the obligations for each employee:

- Specific contracts, according to the laws of Ministry of Labour and Social Affairs in which the obligations and expectations of all parties should be transparent .

- Insurance of employees according to the regulations and providing related documentation for the administration of the hospital.

- Protect employees against occupational hazards through supply conditions, materials, and equipment and vaccinating if they are not safe.

- All hospital staffs in the technical work environment must be dressed in white robes.

- Basic personal protective equipment such as Latex gloves, masks, and massive devices should be available and used in hospitals.

- The available equipment in hospitals must be in accordance with the list of services that must be performed at the hospital and must be in accordance with the work load of hospital.

- In other words, the features of equipment and its components should be in accordance with the objectives and pre-defined requirements in hospital. After purchasing and

installation of machinery and equipment and before using, the good performance of device should be investigated by using appropriate controls and by inserted methods in equipment's brochures.

- It is obvious that this action should be performed periodically and as daily activities of equipment's control and maintenance and after each repairing the device should be conducted. The ID card of equipment is provided to identify each equipment and usually it is provided in a paper. And it should contains the related information to the characteristics of the device, special users, (in appropriate cases) date of purchase and date to begging the work of device in hospital, the situation of device at the buy time (new, used, rebuilt) and how to contact with the manufacturer or sponsor and other required descriptions. The ID of equipment should be retained until that device is used in the hospital. And technical guidelines for each of equipment are used separately and by using the manufacturer's instruction that come with the device, also the scientific references are prepared and contains all necessary information related to the device and how to use it.

- Technical instruction should be maintained in hospital until the device is in hospital.
- Designing lighting system of hospital should be in a situation that enough and uniform light will be provided for various activities. The lighting's degree depends to type of activities, the color of walls and ceiling in the hospital environment,

- Adequate and appropriate area for hospital and its different parts due to the workload (the number of clients and number of hospital beds), a variety of experiments, number of equipment, number of employees and use of automation systems should be estimated. Currently, the area about 100 squares meters for clinical hospitals and 120 squares meters for hospitals that have the anatomical pathology part should be considered as minimum space, but, due to the mentioned above factors, the area of hospital should be enough that don't have a bad effect on work quality in hospital and employee's security and it should not be disrupted over time and increasing volume and scope of work.

References

- Foroozafar, M, Alitaleshi, J, Hashemi, B, Baratloo, E, Motamedi, E, Majidi, E. (2013). Factors influencing job satisfaction of nurses in hospital emergency and martyr Beheshti University of Medical Sciences , Journal - Journal of Nursing and Mamavy martyr Beheshti University of Medical Sciences and Health Services , 23(80) , 10-14.
- Jaap van den Heuvel, Lida Koning, Ad, J.J.C. Bogers, Marc Berg, Monique E.M. van Dijen . (2005) .An ISO 9001quality management system in a hospital: Bureaucracy or just benefits?, International Journal of Health Care Quality Assurance,18(5) , 361 – 369
- Jahani, F, Farazi, E, Rafiee, M, Jadid,i R, Anbari, Z.(2010). Job satisfaction and its related factors on Arak hospital staff . Journal of Arak University of Medical Science ,13(1) , 32-39.
- Kazemi, M, Fonoodi, S.(2009). Analysis of factors influencing patient satisfaction with quality of hospital services, Case Study:Public hospital in Mashhad. modiriate farad journal,8(21),66-72.
- Matilde Rodri'guez-Cerrillo, Eddita Ferna'ndez-Di'az,Amaia In~urrieta-Romero and Ana Poza-Montoro. (2010). Implementation of a quality management system according to 9001 standard in a hospital in the home unit. International Journal of Health Care Quality Assurance , 25(6) , 498-508
- Miresmaili, A.(2006). A comparative study of organizational culture of ISO 9001: 2000 certified and non-certified educational training centers in Tehran . [Thesis for MA Degree].Tehran; Islamic Azad University- roodehen Department of Management and Accounting .

- Mohammadi, E.(2008). Evaluating the medical records departments of hospitals and Kermanshah University of Medical Sciences, based on ISO9001: 2000 standard. [Thesis for MA Degree].Kermanshah: Iran University of Medical Sciences and Health Services , Faculty of Management and Information .
- Noorbakhsh, S.(2000). Standard Hospital Autopsy Approach to ISO9000 Standards. Tehran: kamala danesh Publications .
- Pascale, Pascal, Alain, Chalochet, Odile, Damour . (2002). ISO 9001 certification of a hospital cornea bank, International Journal of Health Care Quality Assurance, 14(4) , 172 - 178
- Soleimanpour, H . Gholipouri,C . Salarilak,S . Raoufi, P . Rajaei Ghafouri, R. Pouraghaei,M. et al. (2012). A sssesmen Of Patient Satisfaction With Emergency Department Services In Imam Khomeini Hospital, Tabriz,Iran. Urmia Medical Journal , 23(1) , 22 – 31
- Taiebi, S, Toorani, S, Khalesi, N.(2002). Total Quality Management In Health care System. Tehran: Jahan Rayane .
- Tsung-Po, Tsai, Hsiu-Chu, Chen and Jar-Yuan, Pai . (2012) . The evaluation of implementing the international organization for standardization (ISO) 9000 quality management system in medical settings: A study from a teaching hospital. African Journal of Business Management, 26(6) , 7779-778
- Valmohammadi, Ch.(2003). A comparative study between of ISO9000: 2000 standards and TQM approaches and developing a suitable framework for the Iranians industries [PhD thesis].Tehran: Islamic Azad University- South Tehran branch , Faculty of Humanities.
- Valmohammadi, Ch. (2011). Quality & Productivity Management. Seconded. Tehran: Islamic Azad University- South Tehran branch .
- Valmohammadi, C., Khodapanahi, M. (2011). The Impact Of ISO 9001:2000 Implementation On Employees' Job Satisfaction: A Case Study. International Journal Of A academic research, 3(1) , 344 - 352