Ranking Tehran Healthcare Centers based on Service Quality using Fuzzy Data Envelopment Analysis

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Abstract

The customer is one of the most effective environmental factors in health services organizations. Experts of management hold that gaining the customer's satisfaction is one of the main tasks and responsibilities of the management of health organization so that commitment to this goal is a prerequisite of success of the business. This is explained by the fact that quality of health and treatment services has to do with health and wellbeing of individuals and given the necessity to provide reliable and adequate medical care for the patient. The quality is of great importance in health care sector as the services deal with the life and wellbeing of people. Any organization needs to develop a specific system to measure its performance; such system helps the organization to make timely and proper decision when needed. Lack of specific functions in data envelopment analysis (DEA) ensures no prejudgment in the surveys of the institutes. Thus, DEA models, thanks to having fewer assumptions in the assessment process have undeniable advantages over other available models. After recognizing input indices (e.g. number of available physicians, number of referred patients to emergency ward and so on), some of the Tehran-based clinics were selected. These clinics were then ranked regarding the quality of their services using DEA.

INTRODUCTION

Knowing about the mental image of the customer regarding the organization not only sheds light on advantages and disadvantages of an organization, but also prepares the ground for adopting proper strategies for performance improvement [1]. Beginning of the third millennium has changed many concepts in the leading organization and, consequently, these organizations nowadays play new roles in the society. The concept of "customer" is one of these changed concepts as it no longer conveys a business transaction. Nowadays, people enter mutual interaction so that now any customer has their own customers. Wining the key customer's satisfaction currently is vital for health and treatment centers. Managers know that their professional success depends on gaining the customer's satisfaction [2]. Therefore, guaranteeing quality of services to achieve the customer's satisfaction is a business approach to win and keep more customers. Reaching the customer's satisfaction means spending more to fulfill three tasks of attracting, keeping, and improving customers and consequently enjoying higher competitive advantages over the rivals which only manage to keep their customer without improvement [3]. Health services institutes, nowadays, experience intense pressure as they have to keep their employees satisfied on one hand and to provide quality services to gain satisfaction of the their patients (customers) on the other hand [4]. This hints necessity to improve organizational performance. Moreover, the customer's satisfaction has a profound effect on now and future of the organization; so that performance of a business depends on keeping the business run. A notable points regarding customer satisfaction are loyalty of the customer and word of mouth marketing. Such marketing also brings more desire to use the services of the institute by the current

customer. All these issues have to do with survival of the organization above all and more importantly development and growth of the organization [5]. Moreover, quality of the services is a key factor in the competitors' assessment of the organization, so that the quality makes the institute distinguishable among other competitors [6]. High quality of the services ensures profitability in long-run, which is true not only for producing businesses but also for services businesses. The advantages rooted in quality of the services also lure the organization to keep supplying high quality services. Noticeable is that health is the key to permanent social, economic, political, and cultural development and that it is vital element in the infrastructure of different section of the society. Hospitals are in center of attention of health and treatment development programs. They provide specialized treatments and play a key role in preserving health of the society [7]. Survival in the today economy and society and permanent development of businesses are entailed with having access to essential information about the performance, the competitors' strategies, technological advances, and changes in business process. Each business needs to implement a special system for evaluating its performance for making proper and timely decisions. Performance evaluation is a key activity for all organization. Furthermore, a key element in performance evaluation program is recommendation of proper approaches and strategies. Performance evaluation of an organization needs pre-defined measures and indicators. Performance indicators have drawn great deal of attention of researchers given the importance of these indicators [8]. Data envelopment analysis (DEA) is one of reliable methods for evaluating relative performance of similar organization, which is based on inputs and outputs. The method uses mathematical programming models to achieve a margin comprised of the institutes with the best relative performance. The margin is a measure to assess and bring in approaches to improve performance of other institutes. DEA does not rely on production function nor does it use prejudgments. Thus, DEA models are distinguishable from other methods thanks to its dependency on fewer hypotheses for assessment [9]. Therefore, using DEA method, the present study is an attempt to rank health and treatment services center located in Tehran on the basis of quality of services. The results give the institute's deeper insight into their performance.

Literature review and theoretical framework

Efficiency: One of the key indicators of performance in the fields of engineering, management, and economy is efficiency. The term was first used in physics and thermodynamics and later expanded to other fields. Efficiency in physics (for closed and mechanics systems) is obtained by dividing actual production (real) by potential production (nominal), which is always less than 1. In management, human inputs are added to physical inputs; and as capacity of individuals is affected by incentives and punishments, the thus the obtained figure might be

bigger than 1. In economics, efficiency is the input to output ratio and always less than 1 [10].

Calculating efficiency: There is a variety of methods to calculated efficiency, which are divided into parametric and non- parametric groups in general.

a. Parametric method: Parametric methods are those, which assume a specific form for production, function (e.g. Douglas Cubfunction) and then the unknown parameters (coefficients) are obtained using one the standard methods in statistics and econometrics for obtaining the function. Afterward, the efficiency is obtained from the obtained function [11].

b. Non-parametric methods: The method is based on optimization series in mathematics, which are mainly used to obtain relative efficiency. The term "relative" is worthy of notice as the obtained efficiency is the outcome of comparing the businesses, which means obtained value may vary by adding or omitting the cases under comparison. The non-parametric method does not need adopting function nor does it have any limitation regarding number of inputs. DEA is a non-parametric method, which is also used in this study [11].

Data envelopment analysis (DEA)

In 1987, Charnesb, Cooper, and Rhodes introduced the first model for evaluating performance of similar institutes in a competitive environment using mathematical programming models. The model is based on yield to a variable scale and known as (BCC) model. DEA models evaluate ability of each diction-making unit in processing inputs into outputs. This ability is known as efficiency. In other words, depending the condition of the units under study, the models first obtain production capability set using linear methods, and then determine margin of production capacity. The margin pictures position of the best input to output conversion. The margin is called the efficient margin. Afterward, assessment of the units are obtained based on their distance from the margin and the approaches to improve efficiency are based on moving closer to the margin [12].

Literature review:

In a study, performance of management system of the employees in Amir Almomenan Hopsital, Semanan city was evaluated during the 3 years after implementation. The evaluation was based on balanced score card in four axes of customer, internal organizational processes, finance, and innovation and development. The results were also evaluated by assigning assessment point. The customer axis included increase in customers' satisfaction, reduction in documented complaints, and improvement of the employees' motivation. The axis of internal organizational processes was also included of informing staff, improving education level, and improving stability of the employees. The results revealed that maximum score was obtained in growth and innovation axis, followed by customer, internal organizational processes, and financial axes. Thus, the system has been least successful in financial field and given the

concentration on functional payment system, weakness of the system in this regard was undeniable. The author argued that cooperation of the employees and the managers and motivating the staff in the early stage of the implementation, through holing training-introduction meeting to promote preferred culture in the organization, are essential for further improvement [13].

Performance of top and middle managers of Hospitals located in Khoram Abad was measured through self-assessment in another study. To this end, one hospital among university-affiliated, social welfare, and private hospital groups were adopted through simple sampling method. The results of average point of organizational leadership for university-affiliated, social welfare, and private hospitals were 26%, 32%, and 21% respectively; these figures for "social responsibility and citizenship" were 29%, 39%, 18% respectively; and for "creativity, risk taking attitudes, and innovation" were 26%, 32%, and 22% respectively. Furthermore, there were evidences of early works in the university-affiliated, and private hospitals for improvement in few leadership processes; while the social welfare hospitals had implemented a wide range of leadership processes. The authors recommended, taking into account the driving force of leadership, documentation of leadership processes, codification of indicators for measuring advancement, monitoring systems, detecting advantages and weaknesses, and preparing the ground for development projects [14].

Asadi et al. [15] studied relative efficiency of 13 public hospitals in Yazd Province using a combination of DEA, balanced score card (BSC), and Cervqual model. Relative efficiency of the hospitals were measured using DEA and BSC for 2008. BSC technique was employed as a tool to design performance assessment indicators and DEA was used to evaluate performance and ranking the hospitals. The results recommended that average relative efficiency of the hospitals under study in 2008 was 0.945. Out of 13 hospitals, 9 were on the efficiency margin and 4 were below the margin.

Kuo [16] surveyed the relationship among human resources (HR) management, organizational learning, organizational innovation, knowledge management, and organizational performance in an attempt to find a way to improve organizational performance through learning and knowledge improvement. A questionnaire was distributed among 659 employees of Taiwan Electricity Industry. The results of data analyses conveyed that HR management strategies have been effective on organizational learning, innovation, and knowledge management; and all these factors have resulted in improvement of organizational performance. Organizational learning leads to organizational innovation and knowledge management improves performance of the organization and the staff by sharing the knowledge.

Bentess et al. [17] used BSC and AHP techniques to achieve comprehensive results regarding performance assessment. The combined model proposed in the study was tested on three large telecommunication companies in Brazil. The results showed that BSC technique surveys all financial/non-financial processes of the companies and

AHP covers ranking and prioritizing the indices of measurement used by BSC. The authors argued that the combined model suits all producing and services industries.

The relationship among employees' performance management, employees' attitude, and performance management was subject of a study by Kagaari et al. [18]. A questionnaire was designed and distributed among 900 of employees of public universities in Uganda. The results of correlation and regression analysis showed that employees' performance management, and employees' attitude are two key elements in general performance management of the organization, which fill in a key role in success of the organization.

Landry and Vandenberghe [19] studied commitment among the employees and the supervisors and the effect of which on employees' performance. To this end, a questionnaire was provided to 300 employees and supervisors in health and treatment services centers. Their results showed a positive and significant relationship between mutual commitment of the employees and supervisors and performance of the employees. In another research, Robertson [20] tested the hypothesis "level productivity and performance of the employees are subject to positive vocational attitudes (engagement in work) and mental welfare and there is a positive and significant relationship among these three factors." The main idea discussed in the study was employees' performance assessment. A questionnaire about employees' engagement in work, performance of the employees, and mental welfare was distributed among 9000 employees of 21 organizations. The data analysis results supported the hypothesis. The authors provided the results of their studies to the management of the organizations.

MATERIALS AND METHODS

The study is a mathematical-analytical study and is aimed to assess the framework of the research. Literature review and interviews were conducted for data gathering. The collected data from literature review was surveyed and discussed with the experts through interviewing and the variables of the study were determined. Afterward, the data required for further analyses were collected from 29 health and treatment services centers located in Tehran city. The data were analyzed using fuzzy DEA software.

Research model

Given the fact that qualitative data were used for evaluating performance of the units under study, fuzzy DEA was adopted for conducting the analyses. The models in fuzzy space are further elaborated in what follows. The models were solved using alpha cut sets.

Let $\left(\widetilde{\theta}_{\circ}^{Min}\right) = \left[\left(\widetilde{\theta}_{\circ}^{Min}\right)_{\alpha}^{L}, \left(\widetilde{\theta}_{\circ}^{Min}\right)_{\alpha}^{U}\right]$ be an alpha cut of $\widetilde{\theta}_{\circ}^{Min}$, then following models can be used:

Model 1:

$$\left(\widetilde{\theta}_{\circ}^{\,Min}\right)_{\alpha}^{L} = \text{Min}\sum_{r=1}^{s} u_r \left(\widetilde{y}_{ro}\right)_{\alpha}^{L}$$

Subject to

$$\sum_{r=1}^{s} u_r \left(\widetilde{y}_{rj}\right)_{\alpha}^{L} - \sum_{i=1}^{m} v_i \left(\alpha\left(\widetilde{x}_{ij}\right)_{\alpha}^{L}\right) \geq 0, \; j=1,\dots,n,$$

$$\sum_{r=1}^{s} u_r \left(\widetilde{y}_{rj}\right)_{\alpha}^{L} - \sum_{i=1}^{m} v_i \left(\widetilde{x}_{ij}\right)_{\alpha}^{L} \leq 0, \quad j=1,\dots,n,$$

$$\sum_{i=1}^{m} v_i \left(\widetilde{x}_{io}\right)_{\alpha}^{L} = 1$$

$$u_r, v_i \geq \varepsilon, r=1,\dots,s; i=1,\dots,m,$$

Model 2:

$$\left(\widetilde{\theta}_{\circ}^{\,Min}\right)_{\alpha}^{U} = \text{Min}\sum_{r=1}^{s} u_r \left(\widetilde{y}_{ro}\right)_{\alpha}^{U}$$

Subject to

$$\sum_{r=1}^{s} u_r \left(\widetilde{y}_{rj}\right)_{\alpha}^{L} - \sum_{i=1}^{m} v_i \left(\alpha\left(\widetilde{x}_{ij}\right)_{\alpha}^{L}\right) \geq 0, \; j=1,\dots,n,$$

$$\sum_{r=1}^{s} u_r \left(\widetilde{y}_{rj}\right)_{\alpha}^{L} - \sum_{i=1}^{m} v_i \left(\widetilde{x}_{ij}\right)_{\alpha}^{L} \leq 0, \quad j=1,\dots,n,$$

$$\sum_{i=1}^{m} v_i \left(\widetilde{x}_{io}\right)_{\alpha}^{L} = 1$$

$$u_r, v_i \geq \varepsilon, r=1,\dots,s; i=1,\dots,m,$$

Let $\left(\widetilde{\theta}_{\circ}^{\,\max}\right) = \left[\left(\widetilde{\theta}_{\circ}^{\,\max}\right)_{\alpha}^{L}, \left(\widetilde{\theta}_{\circ}^{\,\max}\right)_{\alpha}^{U}\right]$ be an alpha cut of $\widetilde{\theta}_{\circ}^{\,\max}$, then following models can be used:

Model 3:

$$\left(\widetilde{\theta}_{\circ}^{\,Max}\right)_{\alpha}^{L} = \text{Max}\sum_{r=1}^{s} u_r \left(\widetilde{y}_{ro}\right)_{\alpha}^{L}$$

Subject to

$$\sum_{r=1}^{s} u_r \left(\widetilde{y}_{rj}\right)_{\alpha}^{U} - \sum_{i=1}^{m} v_i \left(\alpha\left(\widetilde{x}_{ij}\right)_{\alpha}^{U}\right) \geq 0, \; j=1,\dots,n,$$

$$\sum_{r=1}^{s} u_r \left(\widetilde{y}_{rj}\right)_{\alpha}^{U} - \sum_{i=1}^{m} v_i \left(\widetilde{x}_{ij}\right)_{\alpha}^{U} \leq 0, \quad j=1,\dots,n,$$

$$\sum_{i=1}^{m} v_i \left(\widetilde{x}_{io}\right)_{\alpha}^{U} = 1$$

$$u_r, v_i \geq \varepsilon, r=1,\dots,s; i=1,\dots,m,$$

Model 4:

$$\left(\widetilde{\theta}_{\circ}^{\,Max}\right)_{\alpha}^{U} = \text{Max}\sum_{r=1}^{s} u_r \left(\widetilde{y}_{ro}\right)_{\alpha}^{U}$$

Subject to

$$\sum_{r=1}^{s} u_r \left(\widetilde{y}_{rj}\right)_{\alpha}^{U} - \sum_{i=1}^{m} v_i \left(\alpha\left(\widetilde{x}_{ij}\right)_{\alpha}^{U}\right) \geq 0, \; j=1,\dots,n,$$

$$\sum_{r=1}^{s} u_r \left(\widetilde{y}_{rj}\right)_{\alpha}^{U} - \sum_{i=1}^{m} v_i \left(\widetilde{x}_{ij}\right)_{\alpha}^{U} \leq 0, \quad j=1,\dots,n,$$

$$\sum_{i=1}^{m} v_i \left(\widetilde{x}_{io}\right)_{\alpha}^{U} = 1$$

$$u_r, v_i \geq \varepsilon, r=1,\dots,s; i=1,\dots,m,$$

Having the above models solved for each DMU unit, two intervals are obtained for $\widetilde{\theta}_i^{\,Min}$ and $\widetilde{\theta}_i^{\,Max}$. Some researchers believe that geometric mean can be used to combine the above intervals and interval efficiency of each DMU unit.

$$\left[\overline{\theta}_i^{\,Min}, \overline{\theta}_i^{\,Max}\right] = \left[\sqrt{\left(\theta_i^{\max}\right)^L.\left(\theta_i^{\min}\right)^L}, \sqrt{\left(\theta_i^{\max}\right)^U.\left(\theta_i^{\min}\right)^U}, \right], \; i=1,\dots,n,$$

Geometric mean of efficiency is an interval and thus a proper approach for ranking interval data of DMU based on performance. U Method was used for ranking the interval performance. The logic of the method is the probability that an interval is bigger than another interval. Assume "a" and "b" are two intervals of $a = [a^l, a^u]$ and $b = [b^l, b^u]$ respectively, so that $l_a = a^u - a^l$ and $l_b = b^u - b^l$, then probability that "a" is bigger than "b" is:

$$p(a \geq b) = \max\left\{1 - \max\left(\frac{b^u - a^l}{l_a + l_b}, \circ\right), \circ\right\}$$

Finally, the interval figures are ranking in descending order of p_i, that is, the units with larger P_i are ranked higher.

RESULTS

Input indices:
1. Number of physicians to number of emergency patients ratio (X1)
2. Costs of personnel (X2)
3. Costs of renting a place (X3)
4. Facilities of hospital (X4)
5. Location of hospital (X5)
6. Available space in hospital (X6)
7. Number of nurses (X7)
8. Number of ambulance available (X8)
9. Accessibility of the site from different parts of the city (X9)

Output indices
1. The time spent to receive the service by the patient (Y1)
2. Variety of the services (Y2)
3. The patient's satisfaction with the services (Y3)
4. The family's satisfaction with the services (Y4)

Therefore, we know that $\theta_{ADMU}^* \leq \min_{j=1,\dots,n}\left\{\theta_j^*\right\}$ and $\theta_{IDMU}^* \geq \max_{j=1,\dots,n}\left\{\theta_j^*\right\}$ hold. Thus, we need to obtained efficiency of anti-ideal DMU and ideal DMU. Based on the definition, anti-idea and idea items are listed below.

Table 1: Anti-idea and idea DMU data

Indicator	Y1	Y2	Y3	Y4	X1	X2	X3	X4	X5	X6	X7	X8	X9
Ideal Item	1	1	1	1	0.222	0.174	0.101	0.163	0.125	0.025	0	0.08	0.142
Anti-ideal Item	0.098	0.178	0.092	0.127	1	1	1	1	1	1	1	1	1

The ranking was done based on the probability that an interval is larger than another interval. Totally, eleven 29* 29 matrices were developed to calculate probability of largeness of efficiency the hospitals and in turn P_i was obtained. An example of the matrix was obtained for alpha = 0.

Table 2: P_i for $\alpha = \cdot$

Items	DMU1	DMU2	DMU3	DMU4	DMU26	DMU27	DMU28	DMU29	SUM P$_i$
DMU1	0.5	1	1	1	1	1	1	1	7.5
DMU2	0	0.5	0.451	0	0.982	0.353	0.36	0.2	2.846
DMU3	0	0.549	0.5	0.062	0.979	0.42	0.425	0.284	3.22
DMU4	0	1	0.938	0.5	1	0.926	0.921	0.811	6.096
DMU5	0	0.793	0.713	0.207	1	0.66	0.659	0.508	4.541
DMU6	0	0.963	0.859	0.303	1	0.828	0.823	0.665	5.441
DMU7	0.376	1	1	0.897	1	1	1	1	7.273
DMU8	0	0.025	0.027	0	0.533	0	0	0	0.585
DMU9	0	0.911	0.825	0.33	1	0.793	0.789	0.652	5.299
DMU20	0	0.874	0.786	0.268	1	0.744	0.742	0.592	5.005
DMU21	0	0.866	0.759	0.359	1	0.763	0.761	0.643	5.186
DMU22	0	0.814	0.737	0.251	1	0.691	0.689	0.549	4.73
DMU23	0	1	0.941	0.482	1	0.928	0.922	0.806	6.08
DMU24	0	0.6	0.539	0.049	1	0.455	0.46	0.299	3.403
DMU25	0	0.499	0.452	0	0.96	0.358	0.365	0.211	2.845
DMU26	0	0.018	0.021	0	0.5	0	0	0	0.54
DMU27	0	0.647	0.58	0.074	1	0.5	0.504	0.34	3.644
DMU28	0	0.64	0.575	0.079	1	0.496	0.5	0.341	3.63
DMU29	0	0.8	0.716	0.189	1	0.66	0.659	0.5	4.523

The results from the 11 matrices and ranking of the hospitals are listed below:

Table 3: Pi and ranking of DMUS

p_i^α / Unit	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1		Ranking
DMU1	27.815	27.841	27.868	27.904	27.949	28.013	28.144	28.356	28.5	28.5	0	280.89	1
DMU2	10.522	10.264	9.97	9.627	9.237	8.945	8.556	8.062	7.715	7.34	0	90.238	22
DMU3	11.945	11.722	11.423	11.161	10.79	10.365	9.911	9.648	9.258	9.132	0	105.356	21
DMU4	22.363	22.72	23.118	23.393	23.803	24.279	24.733	25.043	25.16	25.32	0	239.932	4
DMU5	16.601	16.802	16.98	17.229	17.533	17.782	18.11	18.207	17.868	17.887	0	174.999	12
DMU6	19.49	19.96	20.389	20.9	21.198	21.42	21.653	21.977	22.332	22.667	0	211.987	6
DMU7	27.27	27.333	27.398	27.408	27.387	27.36	27.325	27.27	27.186	27.363	0	273.3	2
DMU8	2.941	2.841	2.817	2.768	2.752	2.693	2.64	2.586	2.491	2.55	0	27.097	27
DMU9	19.202	19.582	20.044	20.467	20.966	21.209	21.351	21.574	21.94	22.166	0	208.501	7
DMU10	14.101	13.971	13.745	13.583	13.422	13.305	13.32	13.197	13.519	14.075	0	136.237	15
DMU11	3.852	3.776	3.71	3.676	3.744	3.919	4.108	4.304	4.483	4.5	0	40.073	25
DMU12	13.867	13.717	13.483	13.318	13.118	12.904	12.813	12.584	12.831	13.18	0	131.816	16
DMU13	18.065	18.162	18,327	18.45	18.657	18.818	19.056	19.231	19.109	19.145	0	187.02	10
DMU14	16.23	16.23	16.248	16.215	16.212	16.255	16.353	16.487	16.466	15.724	0	162.42	14
DMU15	26.91	26.984	27.051	27.149	27.164	27.127	27.031	26.874	26.814	26.637	0	269.741	3
DMU16	3.678	3.523	3.364	3.232	3.215	3.209	3.271	3.29	3.199	3.314	0	33.295	26
DMU17	12.669	12.415	12.065	11.683	11.216	10.679	10.183	9.941	9.655	9.416	0	109.923	20
DMU18	2.191	2.047	1.912	1.75	1.572	1.27	1.001	0.65	0.5	0.5	0	13.392	29
DMU19	4.587	4.488	4.427	4.426	4.372	4.568	4.801	5.071	5.304	5.5	0	47.544	24
DMU20	18.137	18.402	18.725	19.073	19.467	19.858	19.909	19.933	20.184	20.268	0	193.957	9
DMU21	19.011	19.231	19.568	20.07	20.57	21.154	21.429	21.741	22.164	22.645	0	207.583	8
DMU22	17.304	17.404	17.54	17.663	17.811	17.927	18.223	18.342	18.003	17.923	0	178.142	11
DMU23	22.202	22.508	22.844	23.03	23.28	23.652	24.151	24.584	24.84	24.68	0	235.77	5
DMU24	12.701	12.428	12.16	11.78	11.358	10.965	10.531	10.384	10.312	10.072	0	112.691	19
DMU25	10.539	10.236	9.845	9.382	8,955	8.558	8.053	7.539	7.064	6.665	0	86.836	23
DMU26	2.753	2.645	2.596	2.534	2.464	2.381	2.179	2.099	2.023	1.636	0	23.311	28
DMU27	13.552	13.373	13.145	12.923	12.692	12.474	12.334	12.263	12.508	12.78	0	128.043	17
DMU28	13.521	13.306	12.98	12.716	12.386	12.007	11.674	11.614	11.701	11.842	0	123.747	18
DMU29	16.479	16.589	16.758	16.972	17.209	17.401	17.658	17.648	17.372	17.074	0	171.161	13

DISCUSSION AND CONCLUSION

What is subject to performance measurement can be the organization at macro level, a unit, a process, or the employees. A comprehensive performance management system is featured with taking into account all the aspects, strategies, and goals of the organization. Such approach to performance assessment is a realistic, fair, reliable, progressive, and dynamic assessment.

Given the build-up of social-environmental pressures to make the organizations more responsive regarding their performance, necessity of performance assessment is generally recognized by many organizations. There are, therefore, several approaches to assess performance of an individual, group, organization. Implementation of performance assessment system suitable for the structure, culture and atmosphere of the organization is a must for development and improvement of employees' performance. Effectiveness of such system depends on utilizing some rules; which a concern of many managers. The management mainly seeks practical approaches that help them to improve performance of their employees and prepare the ground for further development and growth of competitive advantages. The results of performance assessment are used as input for motivational system, human forces development, communicating with the employees and HR programming [21].

Performance assessment can be approached from different angles. The two main ones are traditional and modern approaches. The former targets judgment and remainder of performance and assessment control and mainly follows a prescribe style; the approach only concentrates on performance for a specific period and it is based on previous necessities. The latter on the other hand targets training, growth, development of measurable capacities, development of individuals and organizations and their performance, provision of consultation services and participation of stakeholders, motivation and responsiveness for improvement of quality, optimization of activities and operation. It is based on determining advantages and weaknesses of the organization and finding ways for improvement in this regard. DEA is classified in the modern approach and was used here to determine efficiency of the hospitals located in Tehran city. The results showed that only two out of the eight hospitals under study were at effective level, and these two are almost close to the effectiveness margin. This point hints low efficiency of majority of the hospitals under study. In fact, the organization that put more emphasis on efficiency had low points regarding the variables under consideration. Haghighi et al. [22] held in their study that there is a significant relationship between organizational mission and organizational performance and efficiency. That is, organizational mission is one of the determinant factors of organizational culture, which affects organizational performance through influencing culture internalization among the employees. It is notable that mission is currently one of the main concerns of the management and seeks two goals: guideline for decision making; and 2- motivating the employees to reach the organizational goals [23]. Evidently, these two goals are closely related with organizational culture goals and eventually lead the mission and organizational cultural into a specific course that influence efficiency of the company. Therefore, above all the hospitals under study are recommended to define a specific organizational mission to guide them throughout doing other activities.

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