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# Differences and their contexts between teaching and nonteaching hospitals in Iran with other countries: A concurrent mixed-methods study

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## Abstract:

**BACKGROUND:** In terms of missions, hospitals are divided into teaching and nonteaching. In addition, differences in health-care systems in countries will lead to differences in hospitals' operation. Iran, as a specific health-care system, is different from other countries. Hence, the present study investigated differences between teaching and nonteaching hospitals and their differences in Iran and the world.

**MATERIALS AND METHODS:** A concurrent mixed-methods study was conducted in two stages. The first stage was a narrative review of studies (2000–2020). Using narrative inquiry and reflective analysis, the content was analyzed and the categories were extracted. The second stage was a qualitative study conducted using semi-structured interviews with forty Iranian hospital managers and policymakers through a purposive sampling in 2020. Content analysis was made using deductive approach, and MAXQDA 12 was used for data analysis.

**RESULTS:** According to the first stage, categories were extracted as follows: service quality, type of cases, patient satisfaction, efficiency, performance indicators, patient safety, personnel, use of drugs, access to services, technologies, justice in the type of services received, using guidelines, processes, and number of services. In the second stage, 8 main categories, 17 categories, and 45 subcategories were extracted. The extracted main categories were as follows: mission and target, management and behavioral organizations, supply chain and chain of results, human resources, costs and budget, policy demands, clients' satisfaction and patients' right, and integration of medical education.

**CONCLUSION:** Unlike other countries, in Iran, the combination of missions and the complete dependence of teaching hospitals on the government has caused differences. Reducing the treatment mission of teaching hospitals; differences in the budget and development of its indicators; lower tariffs for teaching hospitals; developing a cost–income management model and supply chain; preventing uncertainty other than medical students except medicine; considering the clients' right to choose hospital; and organizing research missions in hospitals were the solutions for decrease differences.

## Keywords:

Health systems agencies, systems integration, teaching hospitals, university hospitals

## Introduction

Hospitals as the main lever of countries' health system are divided into two – teaching and nonteaching hospitals.<sup>[1]</sup>

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On the other hand, different medical systems in different countries will lead to different performances of hospitals and their medical structures. Iran is known as a specific and unique system in the world in this regard

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which is different from many countries in various dimensions. It has been four decades that regional health organization has been merged which is an integrated structure called Medical Sciences University and Ministry of Health and Medical Education is created.<sup>[2]</sup> This structure has predicted two types of hospitals including medical education center and sometimes research and hospitals which are only responsible for medical duties.<sup>[2]</sup> Besides, this difference that teaching hospitals are a subsystem of Supreme Education Council or Ministry of Education in other countries and are a subsystem of Ministry of Health in Iran, Iran, most hospitals are governmental considering ownership and resource supply.<sup>[3]</sup> Another point is different number of teaching hospitals in Iran which is different from that of other countries of the world. According to 2017 statistics, around 45% of the whole active beds and around 63% of Ministry of Health active beds are teaching, which is increasing.<sup>[4]</sup> However, according to statistics, this rate is much lower in other countries.<sup>[5]</sup>

Teaching hospitals in most countries depend on medical university or a part of national or local health system considering organizational system.<sup>[6]</sup> In most countries, these hospitals play a strategic role in teaching health-care professionals and in some countries to serve the underserved urban population.<sup>[7]</sup> Furthermore, these hospitals play an important role in representing complex cases; they have appropriated lots of physical, human, and financial resources to themselves; and also they play related political role in societies.<sup>[8]</sup> Meanwhile, nonteaching hospitals in most countries are those with general services which have activity beside teaching hospitals to protect societies' health.<sup>[9]</sup>

According to the preface and initial review, it is expected that the difference in the mission of teaching and nonteaching hospitals will cause differences in the outcome indicators.<sup>[10-18]</sup> In addition, as mentioned, the difference in the health and medical education system of Iran with that of other countries provides the basis for the difference between teaching and nonteaching hospitals in this field and other dimensions of an organization. Therefore, the present study first deals with the issue of whether are there differences between teaching and nonteaching hospital studies? And whether are there differences between the results of studies in Iran and other countries? So that, the question why and for what contexts teaching and nonteaching hospitals in Iran are different from those of other countries can be answerable.

## Materials and Methods

A concurrent mixed-methods study design was used. The goal of the mixed-methods design was to investigate differences between teaching and nonteaching hospitals

and their differences in Iran and the world by comparing and contrasting two qualitative results. In time orientation concurrent studies, the researcher combined only two studies in terms of time of concurrent research, but there is no preference between the two methods. In this type of research, data collection from each of the two studies is performed and analyzed and, finally, by comparing and combining the results, a general conclusion is presented.

### Study design and setting

The first stage was designed as a narrative review of studies dated from January 2000 to July 2020. The aim of this stage was to investigate differences between teaching and non-teaching hospitals in Iran and the world. The second stage was a qualitative study conducted in Iran in 2020.

### Study participants and sampling

In the first stage, library resources were reviewed, and reliable databases, that is, Medline, ISI Web of Science, EMBASE, Scopus, PubMed, Ebsco, Emerald, SID, Magiran, ensani.ir, Irandoc, and Google Scholar, as a common scientific search engine were searched extensively for information on hospitals. The search strategy was based on the following keywords: "nonteaching," "non-teaching," "nonteaching," "teaching," "University hospital," "Academic hospital," "hospital" AND "medical center." In the second stage, the research population consisted of twenty hospital managers at different levels, and twenty policymakers who had the experience of structure hospitals in Iran and the world were recruited through a purposive sampling and by sampling from significant cases. Hospital managers and policymakers were from different cities of the country and at least had 5 years of working experience.

### Data collection tool and technique

- In the first stage, the inclusion criteria were as follows: (1) original studies with the aim to investigate differences between teaching and nonteaching hospitals and (2) empirical studies that answered the research questions or tested the hypothesis and conducted on specific population and sample. The exclusion criteria were as follows: (1) duplicates; (2) not in English or English abstract; (2) book sections, and other formats (except journal articles); and (4) uncertainty of (the population, the sample, the data collection tool, or the method of data analysis has not been stated)

To find additional articles, relevant study lists were searched by hand. Two reviewers independently screened the title and abstract of the identified articles to confirm the eligibility. The extracted data form, for

each article, was completed. Using narrative inquiry and reflective analysis in the form of audit reports, written notes, and memos, the content was analyzed and the categories were extracted, which were then transformed into tables.

- In the second stage, data were collected by using a semi-structured interview to have an in-depth picture of the participants' perspectives. An interview guide was prepared based on the research goals, the theoretical foundation of the topic, and an extensive review of the literature.<sup>[10-20]</sup> Interview questions included the following: are the goals of these two types of hospitals different? What is their goal? Are there other differences between teaching and nonteaching hospital? Do we mean Iran teaching hospital equivalent to this concept in the world? What are the differences? For what contexts teaching and nonteaching hospitals in Iran with other countries are different?

The participants were contacted in order to arrange the time and venue of the interviews which were often held at the workplace of the interviewees. At the beginning of the interviews, the participants were presented with some explanations about the study and its purpose and were assured of the confidentiality of their information, and those who agreed to take part in the interview signed a written consent form before the interview. They were also informed of the right to withdraw from the study at any time for any reason. A sound recorder was used for recording the interviews in addition to note taking by the interviewer. The interviews lasted from 30 to 60 min and were immediately transcribed after each session. To analyze data, the deductive content analysis approach was used. Based on the initial review of studies in the deductive framework, themes were extracted. Based on these studies, the differences included the mission and purpose, results, costs, and hospital staff.<sup>[10-18]</sup> Data analysis based on the deductive approach included the following steps: (1) typing the interviews, (2) perusing each interview line by line, (3) using the analysis framework, (4) allocating codes and forming themes in the matrix, (5) extracting main themes related to the aim of research in inductive content analysis, and (6) classifying data based on the similarities and differences and forming the subthemes.

Data were gathered during a 5-month period from July 2020 to November 2020. The validity of the data was based on four indicators expressed, including credibility, dependability, confirm ability, and transferability. Concerning credibility, long engagement with data and allocating enough time to gather data were taken into consideration. In terms of dependability, an external reviewer supervised the data-gathering process and approved the results. Content analysis was made using

deductive approach, and MAXQDA Software version 12 That was created by VERBI GmbH in Germany was used for data analysis.

### Ethical consideration

According to ethical considerations, the code of ethics IR.IUMS.REC.1398.259 was obtained from the research deputy of Iran University of Medical Sciences. Some experts were not willing to cooperate and participate in the interviews. Attempts were made to solve this problem and to attract their participation by sending official recommendation letters via our colleagues.

### Results

The findings of this research were divided into two sections. As the first section, in the initial search, all the original articles that investigated one of the teaching or nonteaching hospitals (i.e. 263 articles) were found. After reviewing the criteria for entering and leaving the study, title, abstract, and full text, finally 48 articles were analyzed [Tables 1-3].

The second stage of the research was semi-structured interviews in order to examine differences between teaching and nonteaching hospitals in Iran and the world. The results of this stage obtained from the analysis of 40 interviews created 249 primary codes, which were minimized to 98 codes after deleting duplicate codes and merging similar codes. Ultimately, the leading codes from the data analysis were assigned to 45 subcategories, 17 categories, and 8 main categories [Table 4]. In the following, the research findings with an excerpt from the texts of the conducted interviews were provided.

### Mission and target

*Types of teaching hospitals: Difference in target and mission groups of teaching and nonteaching hospitals – Iran and the world*

In this category, the participants highlighted differences in type, target, and mission of hospitals. The participants said: "We have 2 types of teaching hospitals in the world. Those affiliated with the University of Medical Sciences and a number of hospitals contracted with university. Well, this is not enough in Iran, but it is very common in the world that universities, instead of building hospitals for themselves, are very difficult to manage; buy serve (p. 6)." "There is a medical faculty in the world that has a teaching hospital. The dean of the faculty is the dean of the hospital. But we have a university of medical sciences that has several hospitals, so we are no longer like the world. In some countries, a medical or nursing faculty also has a hospital (p. 17)."

**Table 1: Studies in the world**

Author	Study location	Year (conducted)	Sample and populations	Summary of Findings
Burke <i>et al.</i>	Colombia	2019	232 major teaching, 837 minor teaching, and 1997 nonteaching hospitals; 2014-2015	The total standardized costs, physician, and acute care for 30 days and total costs of 3 days were lower for large teaching hospitals, small teaching hospitals and nonteaching hospitals, respectively. Furthermore, payments for hospitalization index in large teaching hospital were higher than small teaching hospitals and then nonteaching hospitals <sup>[13]</sup>
Ellis <i>et al.</i>	USA	2010	Data up to 2006	The rising rate of patients undergoing colectomy in teaching hospitals compared to nonteaching has increased costs. The mortality rate of these patients has increased <sup>[21]</sup>
Silber <i>et al.</i>	USA	2019	Data from 2012-2014	Mortality, readmission, and ICU hospitalization were lower and staying longer. Although the final cost of hospitalization in Medicare patients in a large teaching hospital has increased, it seems that effectiveness has furthermore increased <sup>[10]</sup>
Czarnecki <i>et al.</i>	Canada	2019	16 teaching and 154 nonteaching hospitals; 2007-2014	The chance of survival of referred patients with myocardial infarction outside the hospital was considerably higher in teaching hospitals <sup>[11]</sup>
Zelle <i>et al.</i>	USA	2019	US hospitals from 2005-2014	The rate of surgical treatment utilizing effective fixators for orthopedic trauma patients was considerably higher in teaching hospitals <sup>[22]</sup>
Memtsoudis <i>et al.</i>	USA	2016	540 hospitals from 2006-2013	Black patients, covered by Medicaid, without insurance, and patients in teaching hospitals had a lower chance of receiving regional anesthesia <sup>[5]</sup>
Gopaldas <i>et al.</i>	India	2013	1000 India hospitals; period of 10 years	The July effect indicates an overall increase in complications at the beginning of the course in hospitals and has had a considerable effect in nonteaching hospitals. In the evaluation of coronary artery bypass graft patients, despite higher complications at the beginning of the course in teaching hospitals, mortality was lower. Therefore, the effect of July cannot be attributed only to the presence of trainees <sup>[23]</sup>
Patel <i>et al.</i>	USA	2016	425 hospitals from 2005-2014	Adherence, functional measures, and outcomes of care guidelines and hospitalized outcomes of patients with heart failure in teaching hospitals were better than noneducational but not considerable <sup>[24]</sup>
Gopaldas <i>et al.</i>	USA	2012	US teaching and nonteaching hospitals; 1998-2007	Patients requiring complicated cardiac treatment in teaching hospitals with a thoracic surgical residency program may get a better outcome <sup>[25]</sup>
Greving <i>et al.</i>	Holland	2005	5 hospitals; 2000-2004	In general, physicians in nonteaching hospitals had less positive attitude toward the usefulness of common treatment guidelines than teaching hospitals <sup>[26]</sup>
Holena <i>et al.</i>	USA	2011	1800 acute care hospitals; 2000-2006	In general, teaching hospitals show better results for complicated elective surgeries compared to nonteaching hospitals. Patients in teaching hospitals were not White and had a minimum income level. An increased risk of mortality was observed in hospitalized patients with emergency admission and postoperative infections of elective surgeries <sup>[27]</sup>
Holscher <i>et al.</i>	USA	2018	US hospitals; 2000-2014	The rate of aortic surgery in patients with Marfan and Ehlers-Danlos syndrome was higher in teaching hospitals. However, there was no considerable difference in mortality and side effects between teaching hospitals and nonteaching hospitals <sup>[28]</sup>
Masoomi <i>et al.</i>	USA	2013	1000 US hospitals; 2009-2010	The rate of autologous breast reconstruction and free flaps is higher in the teaching hospital. Despite more complicated reconstructions, there was no considerable difference between educational and nonteaching hospitals regarding the results of surgery (complications and mortality) <sup>[29]</sup>
Murata <i>et al.</i>	Japan	2011	360 teaching and 226 nonteaching hospitals; April to December 2008	Regarding the results of endoscopic homeostasis treatment during hospitalization for bleeding gastrointestinal ulcers, there was no difference between educational and nonteaching hospitals in terms of average length of stay and mortality rate in 30 days <sup>[30]</sup>

Contd...

**Table 1: Contd...**

Author	Study location	Year (conducted)	Sample and populations	Summary of Findings
Sandhu <i>et al.</i>	Michigan, USA	2013	Michigan hospitals; 2007-2009	There was no considerable difference in death, myocardial infarction, and contrast between educational and nonteaching hospitals in patients with coronary intervention. In teaching hospitals, the risk of vascular complications increased and the risk of emergency coronary artery bypass grafting were reduced compared to nonteaching hospitals <sup>[31]</sup>
Zafar <i>et al.</i>	USA	2014	US hospitals; 2007-2011	The results showed higher mortality and hospital costs, fewer major complications, and shorter length of stays in teaching hospitals. The difference between teaching and nonteaching hospitals was statistically significant but the difference was small <sup>[32]</sup>
Sharma <i>et al.</i>	India	2012	A teaching and a nonteaching hospitals; 2008	The results of educational and nonteaching hospitals show extensive antibiotic prescribing. Further use of antibiotic compounds and their brand names in nonteaching hospitals may be due to pressure from pharmaceutical companies <sup>[33]</sup>
Dumont <i>et al.</i>	USA	2012	University and community hospitals; 1998-2008	Before and after the law on working hours, restriction of resident physicians indicated that the rate of complications of surgery in teaching hospitals increased from 14% to 16%, and in contrast, it was fixed in nonteaching hospitals before and after 2003 <sup>[34]</sup>
Abusaada <i>et al.</i>	Florida, USA	2017	A major community hospital; 2011-2014	Evaluation of hospitalized patients with initial diagnosis of chronic obstructive pulmonary disease indicated that the adjusted cost of risk and length of stay and use of counseling in the educational group were considerably lower. In general, educational services had more favorable results compared to noneducational services <sup>[35]</sup>
Amarneh	Jordan	2017	5 teaching and 8 nonteaching hospitals; 2010	In teaching hospitals, shift work was the only predictor of stressors in nurses, while shift work and nursing care model predicted social support behaviors. In nonteaching hospitals, shift work, education level and nurses' caring pattern were predictors of nurses' stressors <sup>[36]</sup>
Cron <i>et al.</i>	Michigan, USA	2019	76 hospitals; 2012-2016	Surgical patients discharged from teaching hospitals received prescriptions containing more opioids and adjusted risk rates higher than high-risk prescriptions <sup>[15]</sup>
De la Garza-Ramos <i>et al.</i>	USA	2015	US hospitals; 2002-2011	The proportion of patients undergoing revision procedures and complicated methods was considerably higher in teaching hospitals. Patients in teaching hospitals have considerably less complications <sup>[37]</sup>
Grosskopf <i>et al.</i>	USA	2001	236 teaching and 556 nonteaching hospitals; 1994	Teaching hospitals are more inefficient than nonteaching hospitals (about 10% have the ability to compete). Furthermore, 90% of hospitals are exposed to outsourcing or integration and elimination of educational <sup>[38]</sup>
Nandyala <i>et al.</i>	USA	2014	National database; 2011-2002	There was no considerable difference in the mean cost and mortality between hospitals. Patients in teaching hospitals had longer stay duration and more postoperative complications <sup>[39]</sup>
Valencia <i>et al.</i>	Texas	2017	11 major teaching, 12 minor teaching and 73 nonteaching hospitals; 2014-2015	The mean number of laboratory tests per day was considerably higher in teaching hospitals. Patients hospitalized in large teaching hospitals received considerably more tests "after controlling the severity of the disease" and "length of stay" <sup>[14]</sup>
Lichtman <i>et al.</i>	USA	2013	1124 teaching and 3933 nonteaching hospitals; 1999-2006	Seasonal patterns of adjusted risk of mortality rate 30 days after ischemic stroke (obstructive stroke) were similar in educational and nonteaching hospitals <sup>[40]</sup>
Kotwal <i>et al.</i>	USA	2019	Acute care hospitals; 2014	The mortality rate was higher in teaching hospitals with a small proportion. The mean of total cost of treatment and processes in nonteaching hospitals was lower and there was a considerable difference between the two hospitals <sup>[12]</sup>
Perez <i>et al.</i>	USA	2018	A university hospital; 2014-2015	The rate of readmission and mortality in university services was lower than noneducational, but the differences were not considerable. Academic services had considerably lower duration of stay, use of counselors and direct care costs than noneducational services <sup>[41]</sup>

Contd...

Table 1: Contd...

Author	Study location	Year (conducted)	Sample and populations	Summary of Findings
Shahian et al.	USA	2012	229 acute care hospitals; 2008	Availability of patient services and advanced technologies were considerably associated with the severity of hospital education. The intensity of education was favorably associated with the performance of the surgical care improvement project, mortality rate and scores related to the heart failure process. The intensity of education was unfavorably associated with higher mortality, pneumonia readmission and lower patient satisfaction scores. The costs per case were similar in hospitals <sup>[42]</sup>
Shahian et al.	USA	2014	50 hospitals; 2009-2010	Admission of black patients for acute myocardial contraction, heart failure, and pneumonia, the chances of admission of referred patients, and care for referred patients for complicated care services were higher than other centers in large teaching hospitals <sup>[9]</sup>
Messina et al.	New Jersey, USA	2009	7 teaching and 7 nonteaching hospitals; 1999-2003	There is a positive and considerable relationship between patient satisfaction and admission volume in teaching hospitals. However, there was a negative and nonconsiderable relationship between nonteaching hospitals <sup>[43]</sup>

ICU=Intensive care unit

### *Multiple missions, structural contradictions, and confusion in responsiveness and responsiveness of teaching hospitals – Iran*

The participants said: “When your chain of service providers is not integrated; when you do not have a separate service package, you do not have responsiveness (p. 8).” “The Vice Chancellor for Education has the condition of research to promote faculty members; The Vice President for Research has its own policies; The Deputy Minister of Health calls for the development of service delivery; Department of Development and policy organizations requiring hospitals to declare autonomy (p. 21).”

### *Overcoming treatment to education in teaching hospitals –Iran*

In this category, the participants said: “The government’s priority now is treatment, but we have a large number of public teaching hospitals (p. 24).” “At the higher level of the health system structure, we have structural contradictions and accountability in teaching hospitals. Including educational accreditation along with medical accreditation, which is practically very superficial and weak due to the power and governance of the deputy director of treatment (p. 4).” “Visiting should not be one of the main duties of the hospital, while this is the case in Iranian hospitals, especially teaching hospitals (p. 6).”

### *missing research mission in teaching hospitals*

In this category, the participants said: “Lack of payment for research to hospitals; the patient you are researching on, you should not take money from him; the researcher is not given a proper budget at the right time. Accountability is also very weak, that is, even if it is in the laws, but it is not monitored (p. 38).”

### **Management and behavioral organizations**

#### *Difference between educational and nonteaching hospitals in extra-sectorial and intra-sectorial relationships – Iran and the world*

The participants said: “The principal does not have the power or authority to exercise power and oversee departments and students, and must do so through the deputy director. Well, he is actually a member of the faculty of the medical faculty and is accountable to the faculty (p. 35).” “In Iran, we created a vertical structure in the hospital matrix structure (p. 1).”

#### *More complexity of management in teaching hospitals – Iran and the world*

In this category, the participants stated on the complexity of management in teaching hospitals rather than nonteaching hospitals: “It is very difficult to run and management a university hospital. In the world, universities tend to buy services instead of building hospitals (p. 9).” “We are witnessing a duality of management. We have even ignored Fayol’s 14 principles, including unity of command and unity of purpose (p. 24).”

### **Supply chain and chain of results**

#### *Difference in the chain of results of teaching and nonteaching hospitals – Iran and the world*

In this category, the participants said: “Our small teaching hospitals provide easy and inexpensive services. So, complex cases are directed to higher-level public hospitals or to the private sector (p. 18).” “In terms of efficiency, a non-teaching hospital can be stronger because it has a clear structure and organization (p. 40).”

#### *Difference in cost–income management model and supply chain of noneducational and teaching hospitals in Iran and the world*

In this category, the participants said: “Lack of coverage for education has led hospitals to seek funding from

**Table 2: Studies in Iran**

Author	Year	Sample and populations	Summary of findings
Moosavisadat <i>et al.</i>	2011	Teaching and nonteaching in Khoram-Abad; 2009	The quality of maternity care in the nonteaching hospital was higher in terms of facilities, maternal and neonatal care processes, and furthermore more satisfaction than the teaching hospital. In the teaching hospital, the quality of physical space, the level of education and educational level of health-care personnel, and monitoring and evaluation of the quality of care should be improved <sup>[44]</sup>
Hashjin <i>et al.</i>	2014	Hospitals of Iran; 2002-2008	Performance evaluation scores during 2002-2008 in noneducational general hospitals were higher than that of general educational <sup>[45]</sup>
Bastani <i>et al.</i>	2013	Hospitals affiliated to HMoEM; 2008	The ratio of bed turnover and average stay in nonteaching hospitals is better than that of teaching hospitals. In the areas with a bed turnover distance in nonteaching hospitals is less than the teaching hospital. Bed occupancy rate was not considerably different in two hospitals <sup>[46]</sup>
Naghizadeh <i>et al.</i>	2014	Tabriz Hospitals; 2011-2012	The highest level of satisfaction of both types of hospitals was related to physical space and the lowest level was related to information aspects. Satisfaction of nonteaching hospitals was higher than teaching hospitals <sup>[16]</sup>
Keyvanara <i>et al.</i>	2010	Teaching and nonteaching hospitals in Kermanshah; April to Sep 2007	A higher percentage of death certificates in teaching hospitals had a quality of registration. The mistake in the demographic information of certificates in teaching hospitals was more than noneducational. A higher percentage of certificates in nonteaching hospitals were issued by the physician and reported the mechanism of death as the cause of death. A higher percentage of the causes of death mentioned in the certificates of teaching hospitals had a reasonable causality <sup>[47]</sup>
Askarian <i>et al.</i>	2013	University hospitals in Fars; 2001-2002	The rate of total, sharp, and infectious waste production was higher in teaching hospital and internal waste (home) in nonteaching hospital. The percentage of total protective equipment, boots, masks and gloves and other equipment in teaching hospital and accessories, pants, and special form in nonteaching hospital was higher <sup>[48]</sup>
Dehghani <i>et al.</i>	2014	Hormozgan hospitals; 2013	The mean record of medical data and financial and identity information of treatment providers in teaching hospitals was more than nonteaching hospitals <sup>[49]</sup>
Zaboli <i>et al.</i>	2014	University hospitals in Kerman; 2014	The quality of service from patients' perceptions in nonteaching hospitals was considerably higher than that of teaching hospitals. Patients' expectations of service quality in teaching hospitals were higher than nonteaching hospitals but were not considerable. The gap in service quality in teaching hospitals was considerably higher than nonteaching hospitals <sup>[50]</sup>
Shirali <i>et al.</i>	2015	Ahvaz hospitals; 2013	In all attitudes toward safety except teamwork climate, nonteaching hospitals had better status. Differences in teamwork climate, stress recognition, job satisfaction, and mutual understanding of center management between two types of hospitals are considerable <sup>[51]</sup>
Zazouli <i>et al.</i>	2015	Gorgan hospitals; 2014	The total and hazardous waste generation rate was considerably higher in teaching hospitals <sup>[52]</sup>
Delgoshyii <i>et al.</i>	2010	Kashan teaching and nonteaching hospitals	Regarding the quality of work life, the mean workspace in educational and nonteaching hospitals was at the highest level and material facilities and job design were the lowest, respectively. There was no considerable difference between quality of work life in educational and nonteaching hospitals <sup>[53]</sup>
Khoeniha <i>et al.</i>	2016	Qazvin hospitals; 2014	15% of teaching hospitals and 10% of nonteaching hospitals had poor performance. Nurses had the highest level of clinical practice in teaching hospitals in the field of patient support and in nonteaching hospitals in the area of ability to respond to differences <sup>[17]</sup>
Naghizadeh <i>et al.</i>	2014	3 teaching and nonteaching hospitals in Tabriz	There was no considerable difference between vaginal delivery and cesarean section and satisfaction in educational and nonteaching hospitals. Satisfaction with care and support in nonteaching hospitals was higher than educational <sup>[54]</sup>
Hemmati-Maslakpak <i>et al.</i>	2014	Urmia hospitals; 2011	The majority of nurses working in educational and nonteaching hospitals evaluated their communication skills at a good level. Furthermore, with a lower proportion, most nurses in educational and nonteaching hospitals evaluated patients' safety at a good level <sup>[55]</sup>
Safi-Arian <i>et al.</i>	2012	University hospitals in Hamedan; 2010	There is a considerable difference in the type of educational and nonteaching hospitals in the field of technical efficiency. Teaching hospitals have more desirable performance due to having the average stay and active beds <sup>[56]</sup>
Mirzaie <i>et al.</i>	2016	4 teaching and nonteaching hospitals of Iran University; 2013	Appropriate imprescriptible drug classes based on start criteria in teaching hospitals were more than noneducational. The mean of unprescribed appropriate drug had a considerable relationship with the length of stay in teaching hospitals <sup>[57]</sup>
Naderi Manesh <i>et al.</i>	2020	Hospitals of Tehran and Shahid Beheshti University; 2018	In teaching hospitals, the mean of stay and bed occupancy rate were higher and bed turnover was lower <sup>[18]</sup>

**Table 3: Categories extracted from results in the world's and Iranian hospitals**

Basis of comparison	Other countries (teaching hospitals compared to nonteaching hospitals)	Iran (teaching hospitals compared to nonteaching hospitals)
Service quality	More effective treatment Better hospitalization outcomes More favorable service results Better performance measures Higher readmission rates	Lower service quality Evaluate better clinical performance of nurses Better quality of information registration Higher production rates of waste and especially hazardous waste
Type of cases	More complex patients Complex surgeries and consequently higher costs Further use of complex treatment methods Admission of more referral patients	No results
Patient satisfaction	More patient satisfaction	Lower patient satisfaction
Efficiency	Smaller teaching hospital had less efficiency	Efficiency did not differ significantly
Performance indicators	The length of stay was longer in most studies Did not differ In a study conducted in Japan	Longer length of stay Lower performance Lower bed rotation ratio The percentage of bed occupancy was higher in some studies Did not differ significantly in Hospitals affiliated to HMoEM
Patient safety	Higher mortality rates Less major side effects More postoperative complications Less risk of complex treatments Common more postoperative infection	Less patient safety
Personnel	More factors cause nurses stress	The quality of working life was not significantly different Communication skills did not differ significantly
Use of drugs	Further use of antibiotic compounds Prescribing higher rates of high-risk prescriptions due to more complex diseases	A higher proportion of not prescribing appropriate drug classes
Access to services	More access to a variety of services	No results
Technologies	More advanced technologies	No results
Justice in the type of services received	Less justice in the type of services received (serving the poor and the most deprived people in the society)	No results
Using guidelines	Better results of using guidelines Doctors have a better attitude toward guidelines	No results
Processes and number of services	More laboratory tests Make more use of the consultant More processes and more process steps	No results

other sources, including providing additional or false services for patients (p. 4)." "The inefficiency of medical education is due to the lack of supervision and waste of resources in government affiliated universities. It is better to give the cost of education of each student to the student in a competitive way (p. 39)."

### Human resources

#### *Displacement in the use of human resources – Iran*

In this category, the participants said: "Clinical students are for us as dual-personality forces. We are witnessing the recruitment of mid-skilled personnel to provide medical services (p. 38)." "In the world, the resident is not as a medical force. In Iran, medical students study during the day and serve as medical staff at

night. A common mistake is of course due to lack of supervision (p. 16)."

### Cost and budget

#### *Higher cost of facility management in teaching hospitals in Iran and the world*

The participants said: "In teaching hospitals, complex equipment requires additional training and more manpower maintenance costs (p. 2)." "We see the wear and tear and shorter life of the equipment in the training hospital due to its use by unprofessional and inexperienced personnel (p. 11)."

#### *More costly teaching hospitals – Iran and the world-*

The participants said: "In the world, the extra costs that the student imposes on the system; they receive from the



**Table 4: Differences and their contexts between teaching and nonteaching hospitals in Iran with other countries**

Main category	Category	Sub-category		
Mission and target	Types of teaching hospitals and difference in target and mission groups of teaching and nonteaching hospitals - Iran and the world	In the world		
		Often approach of education abstraction (hospital as education field)		
		Refusing to establish a university teaching hospital due to financial-administrative challenges		
		Community-based teaching hospital (target population sickness) and patient-based nonteaching hospital (patient-based)		
		Mission of health, treatment, follow-up, and rehabilitation hospital In Iran:		
		Frequent approach of education integration		
		No distinction between different types of teaching hospitals		
		Requiring medical students and university affiliation of the hospital		
		Classification of services determines patient admission, not hospital mission		
		Islanding the mission of treatment, especially in the teaching hospital		
		Numerous organizational and individual missions and tasks		
		Islanding policy units and lack of systemic view		
Multiple missions, structural contradictions and confusion in responsiveness and responsiveness of teaching hospitals - Iran	Neglecting research mission in teaching hospitals - Iran	Lack of intersectorial communication between supervisory organizations and lack of supervision		
		Confusion of therapeutic and educational accreditation		
		No payment to the hospital		
		Lack of patient cost coverage under research		
		No proper and timely payment to the researcher		
		Lack of monitoring and not defining a powerful response system		
		Overcoming treatment to education in teaching hospitals - Iran		Confusion of teaching hospitals in the priority of education on treatment or treatment over education
				Equipping teaching hospitals in the name of education to palate therapy
				Overcoming treatment over education from the perspective of policymakers
				Lack of supervision and policy decisions and getting the hospital away from the mission of reducing input and focusing on education
				Providing a platform for violation by the system and receiving the costs of training human resources from the people
Management and behavioral organizations	Difference between teaching and nonteaching hospitals in extrasectorial and intrasectorial relationships-Iran and the world	Difference in organizational behavior of teaching and nonteaching hospital personnel - Iran and the world		
		Creating a vertical structure in the matrix structure of teaching hospitals - Iran		
		Ignoring the correct formulation of accountability, power distribution in the organizational structure of Iran teaching hospital		
		Lack of coordination of posts with authority - Iran		
		More complexity of management in teaching hospitals - Iran and the world		Challenges of student presence and interaction with personnel and patients, Iran and the world
				More complex formal and informal organizational structure - Iran and the world
	Difference between decision making system and power distribution and authority of teaching and nonteaching hospitals			
	Ignoring the principle of command unity and the principle of goal unity in Iranian teaching hospitals			
	Lack of coordination of duties with the authority and boundaries of responsibilities in teaching hospitals - Iran			

Contd...

Table 4: Contd...

Main category	Category	Sub-category
Supply chain and chain of results	Difference in the chain of results of teaching and nonteaching hospitals -Iran and the world	Difference in value chain Referring more complex case to teaching hospitals Outgoing teaching hospital: Patient and trained force Skimming by teaching hospitals (especially general teaching hospital) in Iran Difference in the structure and number of human resources in educational and nonteaching hospitals Difference between physical space of educational and nonteaching hospitals difference between inpatient, clinic, and support processes of teaching hospital In the world
	Difference in cost-income management model and supply chain of noneducational and teaching hospitals in Iran and the world	Providing nonteaching hospital resources by providing more service capacity and higher tariffs Providing teaching hospital resources by providing subsidies, negotiating with the free market, and financing the education of students In Iran Not considering the location of the resources for education costs and pushing the teaching hospital toward the supply of other resources Waste of resources in the wide and long structure of universities and inequality of resource distribution for nonteaching hospitals Eclectic and double payment for student education
Human resources	Displacement in the use of human resources - Iran	Becoming a two-character clinical student Garrison of teaching hospitals and promoting injustice in medical education Using students as a medical force and challenging the quality of wservice and patient's rights
Costs and budget	Higher cost of facility management in Iran and world teaching hospitals	Greater depreciation and lower reliability More training and maintenance costs Lack of accountability in damage of equipment and facilities - Iran
	More costly teaching hospital - Iran and the world	Expenditures and equipment for training Presence of training and less income-generating forces High cost of information management Hidden fees The cost burden of compensating the services of employees and students in Iran Lack of budget indicators and rows for different allocation in Iran Lack of budget classification of different types of teaching hospitals in Iran Challenge of hidden costs of teaching hospital Medical error and more diagnostic orders Ignoring these costs by the government in allocating the budget in Iran Ignoring these costs by hospital officials and budget deficit in Iran
Policy demands	Lack of coordination of policy demands with resource supply - Iran	Different view of world governments to the teaching hospital Necessity of covering overhead cost by providing subsidies under the title of training coefficient (presence in field) Cost-effectiveness of medical education Lower tariff of teaching hospital in the world due to higher error coefficient and provision of educational case
Clients' satisfaction and patients' right	The challenge of clients' satisfaction in teaching hospitals in Iran and the world	In the world of lower tariffs, coverage of re-referral services and selection of teaching hospitals through awareness=reducing the impact on patients' satisfaction In Iran, receiving costs from patients, differences in the knowledge of service providers, choosing a hospital out of coercion, lack of awareness of the difference in the concept of teaching and nonteaching hospitals=affecting patients' satisfaction
	Inconsistent guidance of the patient to receiving services in the teaching hospital of Iran	Ignoring the hospital's choice Compulsion due to the exclusiveness of expertise and facilities and limited physical access to services Having a party in the teaching hospital The difference between the patient's preference to the choice of different types of teaching hospitals

Contd...

Table 4: Contd...

Main category	Category	Sub-category
Integration of medical education	Integration of medical education and weakening of education - Iran	Lack of a systemic perspective on integration of health care and medical education Lack of supervision on attendance and training by professors Lack of education in all wards of the hospital The volume of treatment load and the lack of training opportunities Political pressures and policymaking and pushing hospitals towards more performance in treatment Conflict of interests of educational deputy and overcoming treatment on education Tying individual development with factors such as research and treatment Multiple duties of faculty members Lack of monitoring and evaluation of clinical education Lack of indicators of medical education supervision in educational accreditation Institutionalization of large number of diagnostic centers in teaching hospitals and lack of supervision
	Uncertainty of presence in the field of other medical students except medicine - Iran	Lack of specific structure Lack of executive instructions and supervision

student himself (p. 19)." "We have a lot of hidden costs in a teaching hospital for which no one is responsible. Such as manpower error, repetition of services and control tests due to defensive medicine (p. 26)."

#### *The necessity of difference in the budget of educational and nonteaching hospitals, Iran and the world*

The participants said: "The government's policy of covering free medical education requires comprehensive provision of resources and resources (p. 28)." "There is no budget for education in Iran and we do not have indicators for it. Currently, teaching and nonteaching hospitals are not different in terms of budget. Also, the budget needs of different types of teaching hospitals vary based on the level of education, the type of trainee, the number of students, the quality of service and the quality of education (p. 13)."

#### **Policy demands**

##### *Lack of coordination of policy demands with resource supply – Iran*

The participants said: "In other countries, the government is mainly the investor in national programs and student production, and treatment is somehow outside the government's control (p. 27)." "In the world, the cost of a teaching hospital is generally lower and the marginal cost is paid by the government. This is due to the medical error rate, the poverty of the patients in the teaching hospital and the provision of a training case (p. 6)."

#### **Clients' satisfaction and patients' right**

##### *The challenge of clients' satisfaction in teaching hospitals in Iran and the world*

The participants said: "The characteristics of patients who refer to a teaching hospital in most countries include: long waiting time, acceptance of insurance due to the low cost of these hospitals (government coverage),

providing free medical services, and in case of re-referral, it is the hospital's duty to provide services. Therefore, the patient does not expect hotel services and therefore we see no effect on patient satisfaction (p. 15)."

#### *Inconsistent guidance of the patient to receiving services in teaching hospitals of Iran*

The participants said: "At the level of non-acute care services, patients' preference is to choose a non-teaching hospital (p. 12)." "One of the reasons for the presence of a teaching hospital in Iran is to cover services (increase access) and provide inexpensive services (p. 35)."

#### **Integration of medical education**

##### *Integration of medical education and weakening of education – Iran*

The participants said: "Political pressures and policies have pushed hospitals toward greater treatment performance and weakened education (p. 27)." "In Iran, the integration of medical education has weakened education (p. 23)."

#### *Uncertainty of presence in the field of other medical students except medicine – Iran*

The participants said: "The hospital is not just for medical students, all disciplines and levels must experience the on-site training properly (p. 5)." "Not all wards of hospitals are educational, and the practical units of many medical disciplines, such as radiology and paramedical, etc., are not properly trained. Even if the coach is with them; because the coach is not motivated, the supervision is not seen and the lack of support from the hospital staff causes the training to remain incomplete (p. 9)."

#### **Discussion**

According to the results of the qualitative stage of the present study, there has been a shift in the use of

workforce in Iran. In fact, it is stated that employing students as a medical force has challenged the quality of service and patient rights in Iran's teaching hospitals. The results of the review phase also confirm this. Medical group students' and interns' participation in the process of curing patients is inseparable from teaching medicine. Here arises a question that whether patients are aware of teaching hospitals' concept truly and know the level of skill and knowledge of those involved in curing them? Medical assistants and interns in medical education system involved in patient medical and care processes may expose the patient to physical, mental, and even economic complications. While, the patient has not been aware of them enough or has not been satisfied.<sup>[58]</sup>

In addition, the results indicate that patient rights are ignored in Iranian public hospitals (i.e. about 80% of hospitals). Furthermore, according to the results of the review phase, there is a challenge to patient satisfaction in Iranian teaching hospitals. Studies show that considering the fact that many patients are hospitalized in teaching hospitals in one common room and considering the stampede of these units, it seems that the significance of patients' actual condition has been forgotten.<sup>[59]</sup> This challenge will be of higher importance in Iran where governmental medical service system and medical education have been merged in such a way that the patient has limited substitutions practically. In fact, according to distributive justice, although community future interest in training experienced physicians are considered in teaching medicine, it seems that the effect of this matter has not been evaluated on health system.<sup>[60]</sup> A part of governmental hospitals income as well as annual budget is supplied by what is received for services and the franchise paid by people in Iran and in curing hospitalized patients. It is on health policymakers to provide the patients who are cured in teaching system with facilities to balance advantages and disadvantages related to an individual. Furthermore, it seems that the health system has looked for solutions to solve such conflicts through an organizational perspective and standardizes the form and the level of medical group students' involvement by preparing protocol and instruction.

Based on the results of the qualitative stage of the present study, the chain of results of teaching and nonteaching hospitals in Iran and the world is different. According to the results obtained from the review stage, the output indicators of teaching and nonteaching hospitals in Iran and other countries are different. The qualitative phase of the study also emphasizes that more complex cases are referred to teaching hospitals, which is confirmed by the results of the review phase. When the dimensions of a mission are increased in a hospital, the complexities are increased too and so these hospitals are evaluated

in such a way that all of their mission dimensions are evaluated. Therefore, these hospitals' organization has to be improved by leaders' much effort.<sup>[61]</sup> In most of the countries, university medical centers are significantly important in health-care system. In addition to representing a wide range of fundamental and specialized services to the patients under the coverage of these centers, these centers are the major sites of teaching medicine and advanced studies. These centers depend on medical universities.<sup>[5]</sup> In most countries, university medical centers are less involved in operations and care rather than other hospitals. According to the Association of American Medical Colleges data, teaching hospitals depending on this association form only 5% of all hospitals.<sup>[5]</sup> However, these centers represent improper cares to special populations in countries such as the USA, for example Medicare and Medicaid patients, patients under the coverage of charity cares, hospital-transferred patients with complex needs, and burning and trauma victims.<sup>[5]</sup>

According to the results of the present study, incomplete integration of medical education in Iran has weakened education. At the end of the 20<sup>th</sup> century, medical universities defined their goal according to their tastes and as a result, they forgot their unwritten social contract based on meeting the needs and expectations of the society.<sup>[62]</sup> Countries were going to fulfill this important need following Alma Ata Conference. Teaching health human force in Iran services system has been merged following sublime purposes such as conforming teaching with health system changing needs, accountability improvement, teaching community medicine and teaching medicine in the context of the society, problem-oriented research, and ensuring clinical services quality and justice in representing and having access to services.<sup>[62,63]</sup> Of course, the integration of medical education and the presence of students have also had advantages. One of the results of the review phase indicates the better quality of information registration in Iranian teaching hospitals. In most countries, the better qualitative status of registering documents in teaching hospitals may be related to the structure of this center, mutual teaching, and care team superior physician constantly supervising medical activities and students' documentation.

According to the results of the first and second phases of the present study, teaching hospitals are more expensive. Among the costs of these hospitals are the cost of education and equipment, hidden costs, lower income due to education, more information management costs, and the burden of student attendance. In teaching merge approach, teaching hospitals face with fundamental challenges such as financial resource shortage and imbalance in meeting purposes and duties considering

interference in their inherent goal and duties in different fields of teaching, research, and representing medical services to the patients, which leads to organizational perspective growth. Specifically, financial and budget resources in these hospitals are mainly pushed to one or two items of three main functions in various cases that this imbalanced combination prevents teaching hospitals meet all of their needs.<sup>[19]</sup> Studies related to hospitals' productivity and efficiency mostly use data envelopment analysis and often show the weaker performance of the university hospitals. The present study findings mentioned the factors which increase the cost of such hospitals. The most important problem in representing health and medical services is its economic problem, and hospitals in Iran are still faced with this problem.<sup>[64]</sup>

Furthermore, according to the results of the qualitative stage, in Iran, there is no difference in the cost-income management model and supply chain of teaching and nonteaching hospitals. Therefore, it is proposed to provide resources for teaching hospitals by providing subsidies; negotiation with the free market; or the cost of education should be provided by the students themselves. In addition, the resources of medical education were wasted in the wide and long structure of Iranian universities, which is due to the governmental nature of these hospitals and universities, which was another problem based on the results of the present study. There are two basic income resources out of government public budget and exclusive income in Iran medical sciences universities' subsidiary hospitals. Exclusive income consists of cashes received from free patients, cash franchise received from patients under the coverage of different insurance organizations, and the income resulted from insurance services.<sup>[64]</sup> Hospital Autonomy Bill as well as Health Comprehensive Insurance Bill in 1995 has been approved to decrease public budget.<sup>[65]</sup> Hospitals started repaying their staff salaries through demanding and applying higher medical tariffs for patients to compensate for the reduced financial support from the government. In fact, executing Hospital Autonomy Bill successfully needs other prerequisites such as determining real medical tariffs and insurance right higher than the per capita.<sup>[66]</sup> Finally, hospital Autonomy cancelled in 2003 after out-of-pocket payment significant increase and free health services' decrease. After Hospital Autonomy Bill, other policies have been used of which none were successful.<sup>[66]</sup> A new set of rules called "Independent Hospitals" were issued aiming at increasing the income of hospitals from nongovernmental resources. However, from experts' point of view, this plan will not be successful in the case of providing preparations and supervisions.<sup>[66]</sup>

According to the results of the present study, the need for differences in the budget of teaching and nonteaching

hospitals is obvious, which is not the case in Iranian hospitals. Among the problems mentioned according to the present study was the lack of indicators and budget lines for different allocation in Iranian hospitals. The results of the review phase in the teaching hospital, medical error, and the number of diagnostic orders are higher. Also in Iran, the lack of coordination of policy demands with the provision of educational resources is another problem. According to the results of the present study, one of the solutions to solve these problems is to cover the overhead cost by providing subsidies under the title of education coefficient, and also the lower tariff of the teaching hospital is similar to many countries. The important point is that in some countries extra resources have been appropriated to university hospitals through specific budget called education, research, and or serving complex cases.<sup>[7]</sup> Although according to the instruction of Independent Hospital Office, education allowance will be sources financed through an agreement between hospitals and education and research institute, due to the lack of budget-determining indices, these sums will not compensate for the education costs imposed on the hospitals.<sup>[67]</sup> Education costs depend on various factors. Besides the difference in the level of individuals' learning, other factors such as the size of hospital, the level of receptions, the number of procedures, the number of beds, the number of surgery rooms, how hospitals are managed, partnership agreement, and outsourcing units in hospitals may be effective on education.<sup>[67]</sup> Furthermore, according to the opinion of hospital supervisors, a large part of hospitals deductions is related to education; deduction in medical disposable appliances that a specific number of them is repaid by insurance but using them has been increased due to education and so insurance does not repay them.<sup>[67]</sup>

According to the results of the present study, there are different types of teaching hospitals in Iran and the world, but that in Iran, the approach of integrating education and university hospitals is dominant. Teaching hospitals which are governed by governmental budget in countries like the USA play a very important and fundamental role in representing medical services to low-income individuals. Although there is a teaching hospital in every state in most of these countries, they have faced with fundamental challenges in the field of resource shortage and decreased medical quality.<sup>[19]</sup> The important point is that in fact there are two types of teaching hospitals in most countries: university medical centers (big teaching hospitals) and small teaching hospitals. However, university medical centers have two components: teaching hospitals and medical universities. A teaching hospital usually does not have medical university.<sup>[6]</sup> However, studies show that these centers face with considerable operational challenges. Especially that most of them have been merged with

nonresearch institutes such as community-based hospitals.<sup>[27]</sup> Ultimately, nonteaching hospitals enjoy taught and professional medical personnel, but generally they do not change and they are not leaders with medical main advances. In most countries, nonteaching hospitals include public hospitals (community-based hospitals), and their main mission is usually supplying primary or fundamental health and medical needs of a society. Although they are not known due to their medical advances or they are not as distinguished as big teaching hospitals, they are vital as much as it.<sup>[6,9]</sup>

According to the results of the present study, teaching and nonteaching hospitals are different in extra-sectorial and intra-sectorial relationships. Furthermore, Iranian hospitals are different from that of other countries in this regard. These include: creating a vertical structure in the matrix structure of teaching hospitals; ignoring the correct formulation of accountability and distribution of power in the organizational structure of Iranian teaching hospitals; and there was a difference between the organizational behavior of the teaching and nonteaching hospital staff. However, the results of the review stage in the present study showed that there is no significant difference in the organizational behavior of teaching and nonteaching hospitals in Iran. Therefore, this issue needs further investigation. In the world, matrix structure is the helper factor in university medical centers considering their multiple missions.<sup>[20]</sup> In most of world's university medical centers, the head of clinical unit is accountable to the CEO of hospital and also the head of medical university. In fact, the CEO has to be the partner of medical university head. However, there have always been some conflicts among the leaders of teaching hospitals and medical universities.<sup>[20]</sup> The head of the clinical unit is a key connection between the head of the university and the hospital's CEO, a physician who is responsible for the management of relationship between clinical fields and education.<sup>[68]</sup> Thus, unit heads have to be supported by both heads in appointment and selection criteria. This matter has to be considered in other fields.<sup>[67]</sup> For example, a study has stated that although both heads and CEOs at university medical health centers which are responsible for curing, teaching, and research have preferred curing patient and then teaching and research and probably the CEOs preferred curing patient to two other missions, university heads have rated all the three missions equally.<sup>[20]</sup>

According to the results, one of the differences between teaching and nonteaching hospitals in Iran and the world was multiple missions, structural contradictions, and confusion in the response and accountability of Iranian teaching hospitals. These contradictions include the existence of educational and medical accreditation, the fragmented of action of policymaking units, and the

lack of a systemic perspective. Unlike other countries, representing education, research, and medical services has been simultaneous in Iran and so the merged structure of medical teaching and representing services causes some problems which lead to organizational complexity.<sup>[3]</sup> According to the results, one of the another differences between teaching and nonteaching hospitals in Iran and the world was focus on the treatment mission and set aside other missions (teaching and research). Teaching hospitals in Iran face with serious challenges in playing their role due to missions' diversity and insufficient transparency in rules and codes that this study mentioned them as previous ones.<sup>[3,69]</sup> Moreover, these hospitals are responsible for representing specialized and sub-specialized medical services in governmental unit whether considering the number of beds and hospitalization units; representing specific specialized cares in them; and considering the efficiency and effectiveness of human, physical, and financial resources in them quantitatively and qualitatively. Therefore, make a policy, decide, and manage their different dimensions influence the efficiency and inefficiency of health system directly and significantly.<sup>[70]</sup>

### Limitation and recommendation

Some experts were not willing to cooperate and participate in the interviews. Attempts were made to solve this problem and to attract their participation by sending official recommendation letters via our colleagues. As regards the present research was a concurrent mixed-methods study, it was able to study the differences between teaching and nonteaching hospitals in several aspects, as well as the differences between these types of hospitals in Iran and other countries. However, this can be explored from other perspectives, such as differences in input sources, challenges, and problems or other study methods can be used.

### Conclusion

Unlike other countries, in Iran, education is combined with research and health-care services and also the complete dependence of universities and hospitals on the government has caused differences in the results and performance of teaching hospitals in Iran and other countries. Right now, more than sixty medical universities and schools are working in Iran. There are more than 240 teaching medical hospitals covered by the Ministry of Health. However, the important point is that there is almost no teaching hospital according to the defined meaning in Iran and during two recent decades, lot of teaching centers have changed into medical centers practically and so the professors and researchers do not work effectively. Now, the specialists are member of medical sciences university faculty and work in governmental hospital and are resident in

private hospitals at the same time. It is obvious that this method will influence the university students too. Reducing the treatment input of teaching hospitals and focusing on education; differences in the budget and development of its indicators; lower tariffs for teaching hospitals or considering benefits for patients; developing a cost-income management model and supply chain; preventing uncertainty other than medical students except medicine; considering the clients' right to choose the type of hospital; and organizing research missions in hospitals were the solutions for decrease differences in Iran and other countries.

However, there are dissatisfactions from health systems and also teaching medicine in most countries. For example, evaluating and merging health medical cares and education dimensions in teaching hospitals in Brazil show that despite collecting many groups of resources (physical, human, and financial) and also the important political role of these hospitals, the problem of resources' waste still exists.<sup>[8]</sup> Many countries throughout the world such as Canada and the USA have taken measures such as merging teaching hospitals with the local health-care network.<sup>[8]</sup> Another important matter about the improvement of university hospitals performance is evaluating the performance of hospitals to maintain their role as progressive actors in hospital network and also as the main actors of teaching future professional human resources. In fact, around the world, hospital becoming teaching is based on the performance of hospitals.

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### Conflicts of interest

There are no conflicts of interest.

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