

# Designing Iranian Model to Assess the Level of Health System Responsiveness

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## Abstract

**Background:** Given the rapid pace of changes in community health needs and the mission of healthcare organizations to provide and promote the community's health, the growing need to increase health system responsiveness to people as a key element of observance and fulfillment of justice is felt more than ever.

**Objectives:** This study was aimed at designing the native model of responsiveness for Iran and to validate the aspects of the proposed model.

**Materials and Methods:** Our study had a cross-sectional design and was a validation study performed in 2014. In order to define and identify responsiveness model aspects, the first phase recorded the views of 200 key informants from 19 provinces of Iran. Snowball sampling was used to select experts (based on WHO guideline). Then, the opinions of 18 comments were received from service recipients in the form of three focus group discussions and were analyzed by the frame framework analysis (interviewed recipients were selected using the purposive sampling method). Finally, in order to confirm the model's efficacy, a responsiveness questionnaire with 7 aspects (domains) and 52 indicators (items) obtained from the initial proposed model was answered by 600 members of the selected families in the two provinces of Fars and Yazd. A multi-stage cluster sampling approach was used for the household survey. The results were analyzed by the Confirmatory Factor Analysis (CFA) test and through the use of Lisrel software.

**Results:** Confirmatory Factor Analysis, based on the results of the key informant survey and group discussions, showed that according to quantities of GFI = 0.91, CFI = 0.93, NFI = 0.91, RMSEA = 0.074, SRMR = 0.061 and Hoelter (CN) = 178.54 in outpatient services and where GFI = 0.89, CFI = 0.91, NFI = 0.86, RMSEA = 0.064, SRMR = 0.053 and Hoelter (CN) = 158.93 for inpatient services, seven factors (F) (dignity, informed choice, confidentiality, patient training and informing, access to services, quality of basic amenities, and access to social support) are the main determinants of the responsiveness model and proposed model validity.

**Conclusions:** Given the comprehensiveness of presented aspects and indicators in this proposed model and its validity test, the aforementioned responsiveness model can be considered a suitable model to use when assessing the levels of health system responsiveness in Iran.

**Keywords:** Health System Responsiveness, Inpatient Services, Outpatient Services, Iran

## 1. Background

People will not accept poor quality service because it is the only provided option. Patients in the governmental sector encounter staff members who are not motivated and have not had sufficient training, long waiting lines, and inappropriate hours of operation when compared with the people's common work hours. Patient solitude and privacy rights are not respected. In the private sector, people are at risk of financial abuse and are not guaranteed to be safe from risky treatments (1).

Many European countries have recognized that preserving the future of healthcare depends on the health system's ability to balance the changing needs of the people and respond to them in an appropriate manner for the people to remain placated (2).

In this regard, the evaluation of health system perfor-

mance will create vital information for governments and nations. Hence, in recent decades, many countries have focused on evaluating and reporting health system performance as a means to help achieve health goals and developing methods and tools for this purpose (3). The WHO assesses health system performance via three factors: promoting health, improving responsiveness, and fair participation in financing. The responsiveness aspect is an important issue for policy makers and health managers alike (4). In WHR/2000, the WHO defined responsiveness as "a parameter of healthcare system's ability to meet the reasonable non-medical expectations of service consumers" (5).

The concept of non-medical service aspects refers to those parts that focus on providers to show their behavior as something related to the quality of their services.

Some believe that the concept of quality in healthcare organization is non-measurable, and that healthcare organizations cannot develop quality objectives for their organization and measure the quality of their services (6). It has even been said that quality of service particularly in the health sector is a multidimensional concept and an issue with no agreed-upon definition (7).

Many studies have been performed regarding the concept of healthcare service quality. Toms considered empathy, understanding the illness, mutual respect, and religious needs as important when discussing quality of services (8). Silimperi observed the quality of provided service through communication, responsibility, politeness and kindness, cleanliness, and cost aspects (9). In other studies, patients have stated respect and attention to patients, which includes important elements such as empathy, caring, independence, providing information, dignity, and respect to the patient's needs, as important measures of healthcare service quality (10).

The WHO has developed a framework for measuring responsiveness, and based on that, the responsiveness concept can now be expressed through eight aspects: dignity, autonomy, prompt attention, choice of healthcare provider, communication, confidentiality, quality of basic amenities, and access to social support (4, 11). An organization's successful responsiveness will directly affect the patient's welfare and promotion of health (12). All countries' responsiveness ratings were released in the WHR/2000. In the report, 191 countries were rated in terms of health system responsiveness; in the rankings for that year, the United States was listed in first place and Somalia was listed last. Our country (Iran) was ranked in the hundreds (13).

The growing need to increase the health system's patient responsiveness as a key element of observance and fulfillment of justice is felt more than ever. Improved responsiveness, even without changing other health system goals, is valuable. Therefore, measuring and assessing different aspects of responsiveness in our community will provide useful information for policy makers (14).

More importantly, the proposed framework of the WHO's health system responsiveness assessment is not a universal model and is not applicable to all countries. The results of several studies in different countries, including Turkey (15) and Taiwan (16), serve to emphasize that it is better for countries to adapt to their unique conditions and develop native models in order to assess their health system's responsiveness.

## 2. Objectives

The aim of this study was to identify the aspects and indicators of responsiveness commensurate with the characteristics of Iran's healthcare delivery system, as well as to model fitness verification by using a factor analysis technique.

## 3. Materials and Methods

This study had a cross-sectional design and is about the development and validation of the 2014 WHO respon-

siveness framework. In order to design a native model of health system responsiveness for Iran, this study was split into three phases, which are discussed below.

### 3.1. Key Informant Survey

By exploring more than 50 previous studies related to the responsiveness and accountability of healthcare organizations in different countries (from 1999-2013), we came to a thorough understanding of the concept and identified the dimensions and problems encountered via research. We considered the identification of other suggested aspects and indicators based on the views of experts and key informants.

#### 3.1.1. Questionnaire Development

The questionnaire that we used was developed based on key informants and the questionnaire utilized by the WHO (17). It was split into three parts: Respondent Profile (demographic and other background variables), the importance of each listed aspect and proposals for new instances of the listed aspects, and finally the needed reforms taking the shape of deletion, merges, separation, or adding modular aspects. Key informant questionnaire content was assessed for validity through reviewing resources and specialized texts, and by using the expert opinions of professors, participant experts, and key informants. Face validity was evaluated by a pilot study focusing on 15 key informants. Similarly, the reliability of key informant questionnaire was 0.97, according to Cronbach's alpha coefficient.

#### 3.1.2. Key Informants Selection and Data Collection

The sampling and selection method for our key informants was purposive sampling using the snowball sampling method. Experts were selected based on WHO guidelines (17). According to the research conducted by scholars, 45 of the 62 total individuals were selected as focal persons of various cities and provinces. The remaining 17 individuals were omitted from the study due to unavailability. Inclusion criteria were as follows: 1) at least two years of work experience in the health system, and 2) has at least one article published relating to patient satisfaction, healthcare responsiveness, and the accountability of the health system and hospitals. After assessing the views of these selected individuals, they were each asked to introduce at least three qualified experts and key informants in the health system. In total, 200 experts across 19 provinces (33 cities) were selected through this process. The questionnaire was then delivered to them by the proposed methods (paper-based method or internet-based method) (18). In the end, 162 questionnaires were completed and returned (giving an overall response rate of 78%).

### 3.2. Focus Group Research

#### 3.2.1. Focus Group Procedures

In order to discern the views of different groups of people

and users with pleasant and unpleasant experiences during their recent medical stay, three focus group (n = 18) discussions using a semi-structured questionnaire were conducted between different population groups and patients.

The purposive sampling criteria we included were: 1) having a history of hospitalization over three days in length, 2) being older than 18 years, and 3) interested in participating in this research and being willing to actively participate. At the beginning of meetings, after explaining responsiveness concepts and the purpose of our research, we received consent from the interviewees. After ensuring the confidentiality of their information, we recorded the interviews while also taking notes. Focus group discussions lasted between 120 - 150 minutes.

### 3.2.2. Focus Group Analysis

To analyze data gained from interviews, the recordings were transcribed and then a data analysis process was performed using the framework analysis method. The result of this part of the study was the development of a basic model of health system responsiveness for Iran.

### 3.3. Confirmation of Model Fitness by Using Factor Analysis Technique

In the final phase, in order to assess the model's validity via questionnaire, the data of 600 individuals (in the two provinces of Fars [Neyriz city] and Yazd [Taft city]) were collected in 2014 (February and June). A multi-stage cluster sampling approach was used for the survey's household selection.

Based on Cochran's sample size equation ( $\beta = 0.20$ ,  $\alpha = 0.05$ ):

$$(1) \quad s \frac{d}{2} = (25)^2$$

We were able to determine 200 primary individuals. However, in some households there may have been more than one medical service recipient in the past 12 months (or past 5 years), so the design effect (a coefficient of 1.5) was applied to the sample size. Accordingly, in order to carry out the survey, 300 households were selected from each province and a total of 600 questionnaires were completed by individuals.

Then, to select households, each city was divided into different domains based on data from Iran statistical center

(2012) and a sample was selected from each domain. Next, each domain was divided into city blocks and a sample was selected from the blocks within each domain. In the next step, a list of households was determined according to the selected city blocks. Households were then selected from each block at random.

Individuals over 18 years who had received outpatient services during past 12 months or inpatient care during the past 5 years filled the questionnaire. The questionnaire used in this survey was developed based on the WHO questionnaire (19) and the results of this study's previous phases, with changes made to be used for factor analysis and for model fitness confirmation. This way, the 8 aspects proposed by the WHO were reduced to 7. Also, the number of parameters (items) increased from 31 to 52.

To score the questions on this responsiveness questionnaire, a five-option Likert scale very good, good, medium/borderline, poor, very poor was used, with ratings from 0 to 4, respectively. The mean score of each domain was calculated between 0 - 4.

Validation factors of the responsiveness questionnaire were calculated using both the content validity ratio (CVR) and the content validity index (CVI). CVR and CVI scores for the outpatient and inpatient services questionnaires were 0.85 and 0.79, respectively. Cronbach's alpha was used to determine the reliability of questions on the inpatient and outpatient services questionnaire, with values calculated as being 0.90 and 0.94, respectively. These indicate an acceptable level of reliability for the questionnaire.

It is worth noting that this study was approved by the Ethics Committee of the Tehran University of Medical Sciences (91-03-27-12029). The participants signed, or marked if illiterate, the informed consent forms. Participation in the study was voluntary, and participants could withdraw from the study at any time.

The goodness of fit indexes used in the proposed model were the  $\chi^2/\text{df}$  Index, GFI (Goodness of Fit Index), CFI (Comparative Fitness Index), NFI (Normed Fit Index), RMSEA (Root Mean Square Error of Approximation), SRMR (Root Mean Square Residual), and Hoelter Index. The desirable and acceptable levels of each of these indices are shown in Table 1.

This part of study used a confirmatory factor analysis with the maximum likelihood method based on the variance-covariance matrix and by LISREL software (8.8 version). SPSS version 16 was used for other analyses.

**Table 1.** Goodness of Fit Indices of the Study Conceptual Model

Fitness Index	Abbreviation	Desirable Limit	Acceptable Limit	Obtained Value of Model	
				Outpatient Services	Inpatient Services
Relative Chi-square	$\chi^2/\text{df}$	2 >	5 >	4.26	4.63
Goodness of Fit Index	GFI	0.9 <	~ 0.9	0.91	0.89
Comparative Fit Index	CFI	0.9 <	~ 0.9	0.93	0.91
Normed Fit Index	NFI	0.9 <	~ 0.9	0.91	0.86
Root Mean Square Error of Approximation	RMSEA	0.05 >	0.05 - 0.08	0.074	0.064
Root Mean Square Residual	SRMR	0.05 >	0.05 - 0.10	0.061	0.053
Hoelter Critical Number	CN	< 200	< 75	178.54	158.93

## 4. Results

The study sample (key informant survey) comprised 87 males (53%) and 75 females (46%) with a mean age of 39.13 ( $\pm 7.53$ ). Most experts (48%) have between 11-20 years job experience and 59.3% of them have either a B.S. and M.S. degree. Also, 46.3% of the key informants have held jobs at hospitals and medical centers, 40% at universities and research centers, 9.9% at the Ministry of Health, and 3.7% worked as deputies, insurance agents, or other related government agencies.

In the first phase, the results of the country-wide key informant survey led to the identification of 11 aspects and 48 indicators to measure the health system's responsiveness (counting 7 aspects and 32 indicators proposed by the WHO (4, 11)). The most-proposed was "Access to Family Support and Social Networks" with 10 indicators, and the least-proposed was in regards to "Confidentiality" with 1 indicator. Other aspects (and number of indicators) include: Dignity (8), Autonomy (2), Clarity of Communication (4), Prompt Attention (4), Quality of Basic Amenities (4), Choice of Healthcare Provider (4), Patient Safety (4), Medical Error (3) and Legal Right of Complaints Handling (4).

Also in the second phase, the results of the group discussions led to the identification of "6 themes" and "17 subthemes" as key factors affecting the health system's responsiveness: dignity (4 subthemes), confidentiality (2 subthemes), clarity of communication (2 subthemes), access to social support (3 subthemes), quality of providing services area (4 subthemes), autonomy and choice of healthcare provider rights (2 subthemes).

After identifying these aspects and indicators suggested

by key informants and users of services, an expert panel with participating key informants (supervisors and advising professors, hospital managers and experts) was arranged to discuss the proposed aspects and indicators. This resulted in the primary model of the health system's responsiveness for Iran (consisting of 7 aspects and 52 indicators) in both inpatient and outpatient services being proposed.

In confirming this model through the use of confirmatory factor analysis, the results showed that the final model of health system responsiveness has seven determinant factors (F) and 32 items (q). As the data shows, after confirmatory factor analysis and comparing it with the primary model of health system responsiveness, our final model of responsiveness has the same number of factors (F). Only the number of indicators (either in terms of eliminating and/or informing of integration or separation in other dimensions) has changed. The domain (F) and the number of items (indicators), along with examples, are shown in Table 2.

After developing the responsiveness model, various indices are used for the overall goodness of fit model. The obtained quantities from user indicators indicated a proper fitness of the model in this study (Table 1).

Table 3 details the quantities of the standardized factor loadings for the six-factor model (outpatient services) and seven-factor model (inpatient services) in the measurement of the health system's responsiveness. All factor loadings were significant and as expected. The path diagram is shown in Figure 1.

**Table 2.** The Final Model of Health System Responsiveness for Iran in Terms of Domains and Items

Domains/Items	Examples for Domains
<b>F1- Dignity</b>	
7z	
	q1-Receive attention and respect from physician and other health professionals
	q2-Respect for privacy during physical examinations and treatment
	q3-Enough time is spent by physicians and clinical staff for patients to make decisions and choices
	q4-Encouraging patients' comfort and freedom in expressing their worries and concerns
	q5-Respect covering regulations across different categories of employees to facilitate and identify them
	q6-Using the homogeneous personnel to provide services to patients (especially women)
	q7-Provide services in a quiet environment
<b>F2- Informed Choice</b>	
4q	
	q8-Providing information and obtaining opinions on the various methods/alternatives for treatment (if there are different methods of treatment)
	q9-Providing information and getting written, informed consent from patients before starting the treatment process or performing any test



	q10-Patients are free to select their healthcare center
	q11-Patients are free to choose their physicians and other health professionals
<b>F3- Confidentiality</b>	
3q	
	q12-Make sure the patient's discussion with a physician or other healthcare personnel is not heard by others
	q13-Keep the patient's personal and clinical information confidential, except in case of an emergency
	q14-Ensuring accurate information registration and taking actions to protect information
<b>F4- Informing and Educating the Patient</b>	
4q	
	q15-Describe diagnostic and therapeutic issues in simple and understandable terms for patients
	q16-Describe methods of preventing disease (prognosis)
	q17-Show patient how to reach the treating physician and other main members of the medical group during treatment
	q18-Physicians and other healthcare personnel educate patients about hygiene
<b>F5- Access to Services</b>	
2q	
	q19-Easy and convenient access for patients to healthcare facilities (travel time)
	q20-Access to resident (emergency) physician, even on holidays, and getting immediate service
<b>F6- Quality of Basic Amenities</b>	
7q	
	q21-Observe departmental, bedroom, and bathroom hygiene
	q22-Observe food, water, and other edible's hygiene
	q23-Observe hygiene of personnel (hands, clothes, linens, etc.)
	q24-Sufficient space and seating
	q25-Suitable welfare facilities for family members (chairs, beds, etc.)
	q26-Observe air quality and proper ventilation (clean air circulation in rooms and waiting areas)
	q27-Observance of regulations related to hospital (building and facility) safety
<b>F7- Access to Social Support during Care<sup>a</sup></b>	
5q	
	q28-Provide the patient with the possibility to meet with their friends and relatives
	q29-Let patients get in touch with friends and relatives in order to receive external information
	q30-The possibility of receiving some care and services from family or friends (such as food or other consumables)
	q31-The possibility of patient participation in religious activities on their own (also for other religions)
	q32-Providing the possibility to have a liable (attendant) stay with the patient during various stages of diagnosis and treatment, except in special cases

<sup>a</sup>The domain F7 (Access to Social Support During Care) is strictly limited to inpatient services.

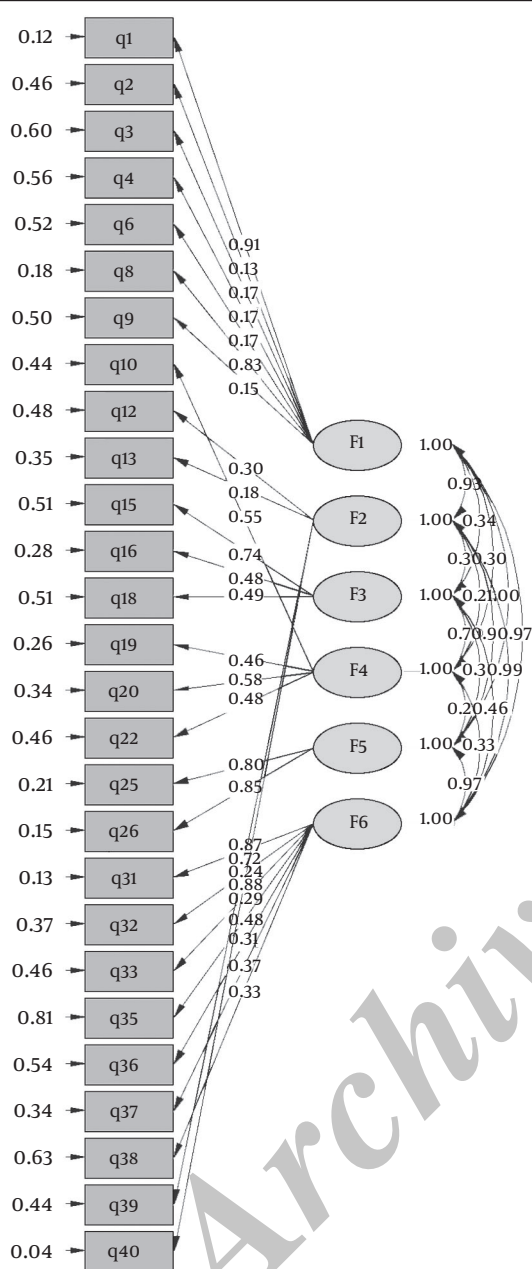
**Table 3.** Standardized Factor Loadings of Health System Responsiveness Model

(q) Items	Factors (F)						
	F1	F2	F3	F4	F5	F6	F7
q1- Receive Attention and Respect	.58						
q2- Respect for Privacy	.53						
q3- Spend Enough Time	.47						
q4- Encouraging Patient Comfort	.53						
q5- Respect Covering Regulations	.32						
q6- Use of Homogeneous Personnel	.46						
q7- Provide Services in Quiet Environment	.60						
q8- Providing Information and Obtaining Opinions		.59					
q9- Getting Written Informed Consent		.45					
q10- Freedom to Select Healthcare Center		.80					
q11- Freedom to Choose Physicians		.78					
q12- Do Not Let Others Overhear Patient			.64				
q13- Keep Patient Information Confidential			.47				
q14- Ensuring Accurate Information Registration			.63				
q15- Describe Therapeutic Issues in Simple Terms				.44			
q16- Describe Methods of Preventing Disease				.54			
q17- Explain to Patient how to Reach the Treating Physician				.62			
q18- Educate Patients About Hygiene				.45			
q19- Easy Access to Healthcare Facilities					.37		
q20- Access to Physician Even on Holidays					.51		
q21- Observe Departmental, Bedroom, and Bathroom Hygiene						.61	
q22- Observe Food, Water, and Other Edible's Hygiene						.45	
q23- Observe Hygiene of Personnel						.56	
q24- Sufficient Space and Seating						.78	
q25- Suitable Welfare Facilities for Family						.66	
q26- Observe Air Quality and Proper Ventilation						.52	
Q27- Observance of Considerations Related to Hospital						.62	
q28- Provide Possibility of Meeting Relatives							.82
q29- Allow Patients to Get In Touch With Friends and Relatives							.39
q30- The Possibility of Receiving Some Services from Family							.44
q31- The Possibility of Patient Participation in Religious Activities							.52
q32- The Possibility to Have a Liable Attendant							.88

It should be noted that, at this stage, all extracted factors have not yet been considered. The main objective now is to explain the factors considered thus far with a smaller number of primary variables. In fact, in the proposed model, the theoretical and factual validity for factors and items that have been kept have been confirmed. Also, the Varimax orthogonal rotation method has been used to calculate the standardized factor loadings, and the correlation of each variable with each factor loading is greater than 0.3 (Factor Loading > 0.3).

In order to compare the responsiveness domains in terms of degrees of importance, 8 values were calculated.

In the outpatient services area, the domains of dignity (F1), informed choice (F2), and Confidentiality (F3) (this having the highest level of importance), had the quantities 6.402, 4.290, and 1.409 recorded, respectively. For inpatient services, the values for the domains of dignity (F1), informed choice (F2), confidentiality (F3), and patient training and informing (F4) (this having the highest level of importance) were recorded to be 7.897, 2.652, 2.021, and 1.430, respectively. It should be noted that if these eight values are greater than or equal to 1, it represents a higher degree of importance and effectiveness for that factor.



Chi-Square = 5090.92, df = 309, P-Value = 0.0000, RMSEA = 0.175

Figure 1. Path Diagram of Responsiveness Framework

## 5. Discussion

Designing a comprehensive model for measuring performance is one of the priorities and needs of each health system. Although the WHO has developed a framework to measure responsiveness, according to various studies conducted using this framework, unfortunately, the healthcare system in Iran has not yet attained an appropriate level of responsiveness (19-21).

So, this study was conducted in order to design a native model of responsiveness in the area of inpatient and outpa-

tient services, considering key informant surveys as well as data from service users that have experienced the current healthcare system's performance. Selecting subjects from different cities of the country in regards to ethnic, cultural, and geographical differences can help researchers more accurately determine and estimate the health system's responsiveness domains. Finally, after implementing several phases, this ultimate responsiveness model was proposed for Iran's health system. In addition, the Goodness of Fit model was performed using factor analysis.

Using confirmatory factor analysis (CFA) and according to the results of Tables 1 and 3, 7 determinant factors (F) and 32 items (q) are present in the final responsiveness model. In a 2011 study of Foruzan, 9 overall aspects were identified as responsiveness factors for mental patients in Iran's health system. It included the following aspects: Prompt attention, respect, clear communication, autonomy, effective treatment, access to care, confidentiality, physical quality of facilities, and access to social networks and family support (22). It is abundantly clear that the proposed dimensions of the model mentioned in that study are largely consistent with the results of our present study.

The comparative fit index shows the consistency degree of our model with real and standardized data. The index calculated from 0 - 1, with values closer to 1 showing that the model has a significant fit. Based on the results shown in Table 1, the amount for inpatient and outpatient services is 0.91 and 0.93, which indicates the one-dimensional strength of this model (a necessary condition to assess reliability and validity). In a similar 2011 study conducted by Gohari, this value has accurately calculated 1 (23).

In measuring this responsiveness model, according to the desirable values of indices in the area of outpatient services, quantities of GFI = 0.91, CFI = 0.93, and NFI = 0.91 indicates very good estimates for the model. Therefore, the 6 dimensions of measuring responsiveness are correctly represented in the model. Also, in measuring the responsiveness model, according to the desirable values of indices in the area of outpatient services, a quantity of CFI = 0.91 indicates very good estimates for the model. And according to the desirable values of indices GFI = 0.89 and NFI = 0.86, they also indicate very good estimates for the model. Hence, the 7 dimensions of measuring responsiveness have been correctly located in the model.

In a 2011 study conducted by Gohari, the index values of GFI, CFI, and NFI were 1, 1, and 0.9, respectively. These values are largely similar to the findings of our present study (23). In another study to develop a model to empower employees in governmental organizations, similar indicators to this study have been used (24). Also, the software output showed acceptable quantities for the RMSEA index (0.05 to 0.08) in the area of outpatient and inpatient services (0.074 and 0.064, respectively). In general, the obtained values of used indices indicate the fitness of the model used in this study.

It should be noted that the Hoelter index indicates that the sample size of 200 or more is required to accept the

hypothesis with perfect adjustment, and a result, would indicate a satisfactory fit (acceptable limit > 75). Thus, caution should be exercised in the interpretation of the sub-dimensions of the responsiveness framework.

Finally, given the importance of the health system responsiveness issue, it is recommended to implement the necessary interventions and reforms to increase the responsiveness of hospitals by using the responsiveness model indicators in a health system's accreditation process.

Although this study as with the other studies was limited in several areas, such as in the selecting of senior-level experts in the Health and Welfare Ministry, conservatism and caution in responding to questions and patients' lack knowledge of their rights is advised. However, indicators presented in the proposed model are more comprehensive and more complete when compared to the same responsiveness level measurements that have already been presented. Because of this, we have developed these indicators detailing various areas of the Iran health system and it has been approved.

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## Footnotes

**Authors' Contribution:** Roohollah Askari was the main investigator and contributed to the development of research protocol, implementation of the research, and drafting of the manuscript. Mohammad Arab supervised the study, the scientific integrity of data collection, and the revision of the manuscript. Arash Rashidian and Ali Akbari-Sari were advisors to the study, contributed to the interpretation of data, and helped to revise the manuscript. Seyed Mostafa Hosseini contributed to data cleaning, data analysis, and writing the methodology and recording the findings. Hojat Gharaee participated in writing the introduction, discussion, and conclusion. All authors have read and approved of the final manuscript.

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