

## **Determining the Factors Affecting of the Performance Assessment of District Health Network (By Exploratory Factor Analysis)**

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**Abstract:** Nowadays, with the amazing advances in the management knowledge, existence of organization's performance assessment system is inevitable. Health System Performance Assessment helps to decision-makers and Policymakers to be ensure responsiveness of their decisions. History of Health System Performance Assessment returns to decade before 2000, but after World Health Organization Report (2000), the issue of Health System Performance Assessment has officially entered in the health literature. In this study, using related key words and related electronic and library resources from 1998 to 2012 have been investigated in both Persian and English language. Initially, the most common and most important of international models of performance assessment in the health has been studied and compared and About 150 criteria and 450 indicators that are involved in the performance assessment of the health system have been extracted. Then by using the survey form of the experts and professionals, 49 criteria related to the performance assessment of the district health network is extracted. Then by using the questionnaire the amount of effect of each criterion on the performance assessment of the district health network has been measured. By performing exploratory factor analysis on the resulting data, five main components have been discovered. In total, these five factors have explained about 65% of the variances. The first main component that has been named *Characteristics of Service Delivery* has the largest share (16%) and the fifth main component that has been named *Primary Health Care* has the lowest share (10%) of the performance assessment of the district health network. Because any assessment model is not complete and perfect, to correction of the defects by the constructive criticism of experts and professionals, designed models should be published both before and after applying. It is recommended that the designed model in this study be applied practically to performance assessment of the district health networks, and then the policymakers and decision-makers should be informed of the results of the practice to identify the strengths and weaknesses of the model and to give recommendations for modification of the model.

[Bahram Tahmasby, Ahmad Barati Marnani, Mohammadreza Maleki, Sodabe Vatankhah, Ezzatollah Mohammadi. **Determining the Factors Affecting of the Performance Assessment of District Health Network (By Exploratory Factor Analysis)**. *Life Sci J* 2013;10(6s):426-432] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 64

**Key words:** health system, assessment, factor analysis, district health network.

### **Introduction**

Nowadays, with the amazing advances in the management knowledge, existence of organization's performance assessment system is inevitable. Any organization for awareness of the level of quality and desirability of their activities, especially in complex and dynamic environments, needs assessment system. Studies indicate that the lack of assessment systems possible reforms necessary to growth, development and improvement of the organization's activities are impossible and are lead to inefficiency and ultimately death of organizations. (Maleki MR, Nasrollahpour D & et al 2011) Performance is the main issue in the all

organizational analysis and attention to organizational performance leads to the development of organizational theory. Assessment and measurement of performance lead to organizational intelligence and individuals' motivation to desirable behavior and is the main part of the development and implementation of organizational policies. Performance measurement is one of the main processes of the management to its performance analysis, review of adaptation between performance and objectives of organization and true decision making in the future actions. (Hajijabbari A, Sarabadani M 2008) In the recent years many countries have improved health and treatment status

especially in the infectious diseases that is reflected in the indicators such as life expectancy at birth, disability-adjusted life expectancy and health related mortality reduction. (WHO 2011) (Nolte E, McKee M 2003) The improvements is associated with continuing some concerns such as increase of chronic diseases prevalence, inequalities in access to health services, inequalities in the health outcomes within and between countries, Variation in the quality of care and safety, mismatch between human resources and health needs and Mismatch between rising health care costs and changes in public expectations. (WHO 2011) The recent economic and financial crisis intensified concerns about the performance of the health system and continuity of health system financing. (OECD 2010) Particularly the crisis has shown well the importance of function and prominent role of the government in maintaining of social solidarity to improve the people health. (WHO 2009)

Health system consists of several components that the components have specific functions and health system performance shows function of the components in fact. Service delivery systems are the most important component of the health systems. One of the most important service delivery systems in the Islamic Republic of Iran is district health network. The network is executive and monitoring unit of the health system in the district. The network with having a set of executive units such as urban and rural health network, rural health home, urban health site and general hospital, is responsible to providing of first and second levels of health service and establishment of family physician program in the its district. (WHO 2006) History of Health System Performance Assessment returns to decade before 2000, but after World Health Organization Report (2000), the issue of Health System Performance Assessment has officially entered in the health literature. Up to now various models with various approaches and objectives have been proposed to performance assessment of health system. The most famous performance assessment model is the World Health Organization model that has been presented in the World Health Organization report 2000. The rest of models are modified version of the World Health Organization model. (Christopher J.L. Murray; David B. Evans 2003) Because a reliable model to assessment of performance of the district health network is not provided up to now, in this study we have been attempt to provide a comprehensive model for performance assessment of the district health network with using *Exploratory Factor Analysis* method.

### Methodology

This study is a descriptive and analytical research which is composed of 4 steps.

**Step1:** in the step with library and database study, the criteria and indicators of effective on health system have been identified. The library study includes review of related reference books, journals and dissertation. In the database study, the key words include: operation, function, performance, evaluation, assessment, appraisal, model, framework and health system are used single or combined form. Database consists PubMed, Google Scholar, Scopus, Elsevier, MEDLIB, Ovid, IranDoc, IranMedex, Magiran. To study of models, the most important and the most common international models that are cited by countries and the international communities, have been used.

**Step2:** in this step using a questionnaire, of respondents have been requested that score from 0 to 100 the impact of the each criteria, which extracted in the previous step, on the performance of the district health network. In this step, the purposive sampling has been used from health related managers and experts in order of importance. The sample size is 5 to 10 times the number of questionnaire variables. The reliability of the questionnaire has been approved with Cronbach's alpha statistics.

**Step3:** in this step the data collected in the previous step has been analyzed using SPSS software. The *exploratory factor analysis* method has been used to determine the main factors affecting on the performance of the district health network.

**Step4:** in this step for each main component that was explored in the previous step an appropriate name has been selected.

### Findings

**Step1:** in this step, by search in the related references and databases, about 150 criteria for assessment of the health systems performance are identified and extracted. Since the criteria that identified have been related to the entire health system, Using researcher's experiences and consultation with experts, 49 criteria related to performance of the district health network have been selected. In this step, the statistic of *Content Validity Ratio* has been used.

**Step2:** in this step using a questionnaire, of respondents have been requested that score from 0 to 100 the impact of the each criteria, which extracted in the previous step, on the performance of the district health network. Numbers of 700 questionnaires have been distributed among experts, administrators, and professionals related to district health network. The purposive sampling has been used from health related experts, administrators, and professionals in order of importance and number of 464 completed questionnaires were collected at the end. (table1)

**Step3:** in this step the *Exploratory Factor Analysis* has been done on the data that collected from 464 questionnaires, by SPSS software. The Sampling adequacy has been approved using *Kaiser-Meyer-Okin* (KMO) statistics and appropriateness of data structure (sphericity) has been approved using Bartlett's test. (Table2)

By doing *Exploratory Factor Analysis*, five main components that explain about 65% of the variance has been discovered. The first main component, with 11 criteria, explains about 16% of variances. The second main component, with 10 criteria, explains about 14% of variances. The third main component, with 10 criteria, explains about 14% of variances. The fourth main component, with 11 criteria, explains about 11% of variances. The fifth main component, with 7 criteria, explains about 10% of variances. (Tables3&4)

**Step4:** In this step, initially based on researcher's experience and search in the related references, the names that had the most relevant have been identified and to final selection the opinions of related experts and professionals have been used. The first main component with 65% of votes has been named "*Characteristics of Service Delivery*". The second main component with 80% of votes has been named "Supportive *services*". The third main component with 63% of votes has been named "Integrated *services*". The fourth main component with 58% of votes has been named "New *attention services*". The fifth main component with 87% of votes has been named "*primary health care*". (table5).

### Discussion and conclusion

In this study, by search in the related references and databases, about 150 criteria for assessment of the health systems performance are identified and extracted. Since the

District health network is the one of the components of the health system, It was necessary that the criteria related to performance of the district health network is isolated from the rest. For this purpose, a questionnaire is designed and experts and professionals are requested that state their opinion about relationship between these criteria and the performance of the district health network. The 49 criteria have been isolated from 150 criteria by using statistic of *Content Validity Ratio*. The *Content Validity Ratio* indicates the content validity of questionnaire. The *Content Validity Ratio* above 62% has been accepted. (Wilson, F.R., Pan, W., & Schumsky, D.A 2012) Cronbach's alpha for the reliability of the questionnaire has been used in the step2. In this study, the Cronbach's alpha is obtained 0.978. Given that Cronbach's alpha above 0.7 is acceptable, so the questionnaire have high reliability.

The *Kaiser-Meyer-Okin* (KMO) statistics for the Sampling adequacy has been used in the step3. The KMO statistics is obtained 0.968. Given that the KMO statistics above 0.75 is acceptable, so the number of samples is very good. The Bartlett's test has been used to appropriateness or sphericity of data structure. Given that the Sig=000, so the structure of the data is appropriate. (Momeny,Mansoor; Faal G,Ali 2009) The five main components and the amount of effect of 49 selected criteria on the performance of the district health network are determined. (Anna B. Costello; Jason W. Osborne 2005) Factor analysis is a statistical method to analyze of tables or matrices of correlation coefficients. (Wunesch, Karl L 2006) In addition to suggestion or exploration, the factor analysis can be used to construct of the model, hypothesis and structure. (Wunesch, Karl L 2006) (Zandhesami H; Rajabzadeh A; Toloie A, 2010) The Cumulative Sums of Squared Loadings is obtained 65%. Given that Cumulative Sums of Squared Loadings above 60% is acceptable, so the determination of these five main components is appropriate. (Leandre R. Fabrigar; Duane T. Wegener 2011) In total, these five factors have explained about 65% of the variances. The first main component that has been named *Characteristics of Service Delivery* has the largest share (16%) and the fifth main component that has been named *Primary Health Care* has the lowest share (10%) of the performance assessment of the district health network. This finding shows that *Primary Health Care* is less important and *Characteristics of Service Delivery* is most important in the assessment of district health network. Therefore, it is necessary that the health sector policy makers to focus more on the criteria related to *Characteristics of Service Delivery*.

The assessment of the health system performance should be just and reasonable at the beginning, and then the appropriate indicators should be made or developed gradually and be adapted with information system. Although assessment of the health system is desirable potentially but that is only useful when the assessment fills gaps among the overall level measuring, individual functions and interventions that will lead to changes. (WHO 2001) It should be considered that the assessment of performance is a dynamic, developmental and bilateral process. (Chang 2007) Many of the actions, especially in the public health, Affect the results in long-term, so the assessment methodology should reflect it. (Julio Frenk b, Christopher JL Murray 2003) Many researchers believe that the criteria of assessment should be derived from strategies as much as possible, so it is necessary that the executive units have clear objectives and appropriate programs for their activities.

Because any assessment model is not complete and perfect, to correction of the defects by the constructive criticism of experts and professionals, designed models should be published both before and after applying. It is recommended that the designed model in this study be applied practically to performance assessment of the district health network and the policymakers and decision-makers should be

informed of the results of the practice to identify the strengths and weaknesses of the model and to give recommendations for modification of model.

**Acknowledgement:**

This study was part of a PhD dissertation supported by Tehran University of Medical Sciences (Grant No.: TUMS/SHMIS-1391/646)

**Table 1:** Frequencies of respondents

gender		Education			Job title			Experience		
Male	Female	Bachelor	Masters	M.D	Manager	Expert	Chief expert	Low	Medium	High
220	244	319	44	101	72	256	136	145	225	84
Total=464		Total=464			Total=464			Total=464		

**Table 2:** Statistics of Reliability, Sampling Adequacy and Sphericity

Reliability Statistics		Sampling Adequacy		Bartlett's Test of Sphericity		
Cronbach's Alpha	N of Items	KMO (Kaiser-Meyer-Olkin)		Chi-Square	df	Sig.
.978	49	.968		19337.882	1176	.000

**Table 3:** Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	23.894	48.763	48.763	23.894	48.763	48.763	7.876	16.073	16.073
2	2.950	6.021	54.784	2.950	6.021	54.784	6.903	14.088	30.161
3	1.995	4.071	58.856	1.995	4.071	58.856	6.768	13.812	43.973
4	1.747	3.565	62.420	1.747	3.565	62.420	5.449	11.121	55.094
5	1.317	2.687	65.107	1.317	2.687	65.107	4.907	10.014	65.107

Extraction Method: Principal Component Analysis.

**Table 4:** Rotated Component Matrix<sup>a</sup> (sorted)

	Criteria( Sub-Component)	Component				
		1	2	3	4	5
Q46	Efficiency	<b>.758</b>	.311	.239	.205	.154
Q45	Effectiveness	<b>.734</b>	.349	.236	.221	.190
Q48	Service Tolerance	<b>.733</b>	.289	.295	.190	.094
Q42	Acceptance of Services	<b>.711</b>	.229	.211	.228	.175
Q44	Continuity of Service	<b>.704</b>	.220	.205	.323	.244
Q40	Quality Management	<b>.665</b>	.217	.098	.284	.287
Q43	Service Appropriate	<b>.658</b>	.215	.217	.283	.298
Q47	Responsiveness	<b>.653</b>	.353	.233	.204	.126
Q41	Physical Availability	<b>.651</b>	.220	.212	.186	.254
Q49	Safety Management	<b>.646</b>	.280	.294	.194	.094
Q37	Outcome	<b>.519</b>	.198	.243	.453	.247
Q20	Human resource planning	.300	<b>.781</b>	.151	.203	.105
Q21	Cost Management	.237	<b>.755</b>	.180	.252	.158
Q19	Allocating of Founds	.234	<b>.745</b>	.262	.127	.115
Q22	Human Resource Assessment	.356	<b>.695</b>	.208	.286	.156
Q24	Equipment Management	.252	<b>.643</b>	.153	.345	.212
Q23	Human Resource Education	.380	<b>.605</b>	.215	.296	.150
Q18	Collecting of Founds	.243	<b>.580</b>	.346	.155	.067
Q25	Drug Management	.224	<b>.569</b>	.173	.392	.252
Q15	Planning	.313	<b>.506</b>	.233	.222	.351
Q16	Assessment System	.332	<b>.495</b>	.208	.201	.334
Q13	Psychiatry Health	.197	.213	<b>.742</b>	.237	.047
Q9	Senile Health	.193	.259	<b>.706</b>	.034	.297
Q2	Lifestyle Changes	.278	.078	<b>.703</b>	.152	.253
Q11	Dental Health	.154	.233	<b>.697</b>	.177	.141
Q3	work style Changes	.217	.039	<b>.686</b>	.174	.240
Q8	Middle-aged Health	.181	.330	<b>.678</b>	.072	.330
Q12	Chronic Disease	.225	.219	<b>.668</b>	.272	.156
Q7	Young Health	.211	.279	<b>.634</b>	.071	.417
Q1	Behavior Change	.236	.131	<b>.602</b>	.233	.386
Q14	Specific Disease	.123	.166	<b>.597</b>	.358	.065
Q35	Research System	.211	.258	.336	<b>.640</b>	-.065
Q30	Family physician	.241	.240	.202	<b>.625</b>	.264
Q38	Electronic Government	.437	.157	.123	<b>.593</b>	.170
Q27	Community Participation	.237	.390	.295	<b>.566</b>	.230
Q36	Outsourcing	.327	.255	.371	<b>.552</b>	-.004
Q34	Health Education	.321	.262	.154	<b>.529</b>	.275
Q26	Information System	.288	.397	.136	<b>.526</b>	.361
Q39	processes Improvement	.424	.314	.238	<b>.521</b>	.116
Q31	Human Resource Status	.295	.458	.219	<b>.485</b>	.251
Q33	Hospital Coordination	.270	.340	.365	<b>.474</b>	.115
Q28	Satisfaction	.385	.370	.214	<b>.436</b>	.084
Q6	Children Health	.174	.192	.310	.081	<b>.763</b>
Q4	Mortality	.145	.065	.345	.099	<b>.741</b>
Q10	Mother health	.173	.150	.210	.050	<b>.715</b>
Q5	Birth Condition	.140	.145	.272	.148	<b>.689</b>
Q29	Vaccination	.286	.153	.001	.318	<b>.593</b>
Q32	Primary Care	.308	.392	.170	.424	<b>.425</b>
Q17	Acute Disease	.358	.300	.302	.151	<b>.424</b>

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 9 iterations.

**Table 5: Main component, Sub-component & Factor loading**

	Main component	Sub-component	Factor Loading
Performance	Characteristics of Service delivery	Efficiency	.758
		Effectiveness	.734
		Service Tolerance	.733
		Acceptance of Services	.711
		Continuity of Service	.704
		Quality Management	.665
		Service Appropriate	.658
		Responsiveness	.653
		Physical Availability	.651
		Safety Management	.646
	Outcome	.519	
	Supportive services	Human resource planning	.781
		Cost Management	.755
		Allocating of Founds	.745
		Human Resource Assessment	.695
		Equipment Management	.643
		Human Resource Education	.605
		Collecting of Founds	.580
		Drug Management	.569
		Planning	.506
		Assessment System	.495
	Integrated services	Psychiatry Health	.742
		Senile Health	.706
		Lifestyle Changes	.703
		Dental Health	.697
		work style Changes	.686
		Middle-aged Health	.678
		Chronic Disease	.668
		Young Health	.634
		Behavior Change	.602
		Specific Disease	.597
	New attention services	Research System	.640
		Family physician	.625
Electronic Government		.593	
Community Participation		.566	
Outsourcing		.552	
Health Education		.529	
Information System		.526	
processes Improvement		.521	
Human Resource Status		.485	
Hospital Coordination		.474	
Satisfaction	.436		
Primary Health Care	Children Health	.763	
	Mortality	.741	
	Maternity health	.715	
	Birth Condition	.689	
	Vaccination	.593	
	Primary Care	.425	
Acute Disease	.424		

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3/25/2013