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## Short Communication

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### IDENTIFYING AND PRIORITIZING TRANSFERRABLE THERAPEUTIC UNITS WITH ANALYTIC HIERARCHICAL PROCESS (AHP) IN MEDICAL SCIENCE UNIVERSITY OF SHIRAZ IN 2015

Mehdi Kalantari Meybodi<sup>1</sup>, Shaghayegh Vahdat<sup>2\*</sup>, Somayeh Hessem<sup>3</sup>

1. Department of Healthcare Management, Fars Science and Research Branch, Islamic Azad University, Marvdasht Iran
2. Department of Healthcare Management, Marvdasht Branch, Islamic Azad University, Marvdasht, Iran.
3. Department of Health Services Administration, Shiraz Branch, Islamic Azad University, Shiraz, Iran.

\*Corresponding author's Email: [sha\\_vahdat@yahoo.com](mailto:sha_vahdat@yahoo.com)

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#### ABSTRACT

**Introduction:** Concerning the increasing growth of outsourcing in health services of hospitals, increase of productivity and promotion of service qualities, identification, and priority of suitable units and their transfer to non-governmental sector can be a solution for policy makers of health system

**Method:** This is a descriptive-qualitative study and the authors identified outsourcing indices of health services, criteria, and sub-criteria using related documents and opinions of experts. Then hierarchical structure was designed and after completion of the questionnaire of pairwise comparison of indices and outsourcing units via 15 experts in outsourcing field, data were analyzed and ranked using EXPERT CHOICE software.

**Results:** Pairwise comparison of outsourcing indices showed that the index of performance monitoring has the highest importance in outsourcing and the unit of injection & wound bandage has the highest priority for transfer among transferrable therapeutic units.

**Discussion and conclusion:** Concerning previous trend of health service outsourcing and choosing units without paying attention to codified indices, one of requirements of health & treatment system is to use indices and to prioritize units in decision making of policy makers and managers of health system in order to prevent losses of system due to choosing improper units.

**Keywords:** outsourcing, prioritization, hierarchical analysis, AHP technique, health service.

#### INTRODUCTION

Health sector is one of the most expensive economic sectors of the country. The nature of its activity due to dealing with the health of human beings causes that its outcome is considered as an undeniable and basic necessity and public and authorities always desire effective and efficient services (Jabari Beirami, 2014). On the other hand, inefficiency of government for dealing with economic sectors, low efficiency and productivity of many governmental enterprises, low

quality of services presented by the government and cost pressure in both developing and developed countries have questioned the presumption that health & treatment organizations should be necessarily managed by governments (Ansari, S, 2013). In addition to reduction of costs and promotion of efficiency, organizations due to different reasons try to transfer their internal activities to outside the organization and reduce their sizes. The most common reasons for transfer of activities and public services

include paying more attention to critical activities, weak performance of internal units, lack of importance of the activity that has been transferred, higher quality and lower time for doing the activity outside the organization, insufficient specialty inside the organization for presenting service or producing a product, lack of potential control on activity inside the organization, presence of services and activities that do not associate with the organization in long term (Khalili far.S.O, 2014). The main problem of top managers is to determine services that should be outsourced. Experiences show that many organizations outsource mistakenly different projects for controlling or optimizing the condition without careful investigations. Such decisions incur costs and inefficiency on organizations and sometimes organizations have to return the activities (Motlagh ME, 2008# 15).

#### **Literature Review**

Outsourcing means to transfer some internal activities of an organization to outside suppliers and to transfer the right of decision making to outside of organization based on the contract (Kavousi z, 2010). Transferring is planned with an increasing trend as a political instrument with potential of increasing success, justice, quality, and efficiency of health services (Liu x, 2004). Although there are many advantages for transferring services to private sector, there are many obstacles for transferring health services to private sector. In other words, if the main infrastructures of transferring such as education of authorities, determination of proper goal and formulation of appropriate model are not reinforced, the main goal of transfer in health & treatment sector will not meet (Karimi S, 2011). The main goal of taking transfer strategy is to minimize the size of governmental organizations and their financial burdens in one hand and participation of public in controlling different sectors of the country on the other hand (Jabari Beirami, 2014). In addition to reduction of costs and promotion of efficiency, organizations due to different reasons try to minimize their size and transfer internal activities to outside suppliers. The most common reasons for transfer of activities and public services include paying more attention to critical activities, weak performance of internal units, lack of importance of the activity that has been transferred, higher quality and lower time for doing the activity outside the organization,

insufficient specialty inside the organization for presenting service or producing a product, lack of potential control on activity inside the organization, presence of services and activities that do not associate with the organization in long term (Khalili far.S.O, 2014). Advocates of outsourcing strategy believe that outsourcing causes improvement of performance and presentation of services, promotion of health system goals by providing competition between suppliers and economic drivers (Gholamzadeh.R, 2012). In addition to financial, official, human, and time savings, outsourcing causes concentration on strategic activities, reduction of debts and allocation of organizational capitals to goals and activities in which it has a distinct qualification compared to competitors (Kavousi z, 2010). In health system of Iran and since two recent decades, many efforts have been done for outsourcing and most of them have been about supportive services based on article 44 of the constitution, articles 144 of the act of the fourth development program, and articles 33 and 88 of the act of regulating part of financial regulations of the government and articles 13, 16 and 24 of the act "management of state services and they are less about therapeutic and Para-clinical units. Factors such as hospital, amount of activity, type of services and other similar factors are effective on reduction of responsibilities (Tabibi S, 2008). In the study on identification and prioritization of transferable units of hospitals, Mousazadeh et al (2012) identified 9 indices and 29 hospitals during group discussion and they were surveyed by Delphi. A consensus was obtained during three stages of Delphi for each index and 27 units (of 29 units). The most important index was quality (100%) and the least important index was work pressure of personnel (76.1%). Supportive and Para-clinical units had the highest potential for outsourcing and units of presidency, management and financial affairs were those for which using outsourcing were not confirmed (Mousazadeh y, 2012). Concerning that residency, financial affairs, and management are among governance jobs and they cannot be transferred to private sector and they can only be delegated based on managerial agreement and article 16 of the act "state services", they should not be identified as transferrable units. Also, concerning the nature of supportive services units such as services, cleaning, facilities, green space, cooking and food

distribution, telephone booth, the transfer of abovementioned units is clear for everybody and all supportive service units of medical science university of Shiraz were transferred in last year and based on approval of cabinets of the tenth government and announced circulars, the university has to conclude contract with abovementioned units. In a study on the tendency to outsourcing based on features of different units of hospital from views of managers and staff of hospitals selected by medical science university of Shiraz, Kavousi et al (2011) stated that food services (87%) had the highest tendency to outsourcing and nursing services had the lowest tendency to outsourcing (43.4%). Plot of decision matrix indicated that tendency to outsourcing should be low in nursing, radiologic and laboratory services and tendency to outsourcing should be high in food services. Research results showed that there was a difference between results obtained from decision matrix of radiologic and laboratory services and tendency to outsourcing of services from view of managers. One of the reasons was lack of sufficient attention of managers to features of different units of the hospital while making decision on their transfer. On the other hand, in most cases, managers outsource services without paying attention to features of the services due to reduction of costs. Therefore, it is better that hospital units are outsourced based on scientific principles (Kavousi z, 2010). In this research, outsourcing of health services has been dealt with only from view of managers and staff of hospitals and the views of experts and professors have not been considered. Tourani et al conducted a study on prioritization of factors influencing on purchase of medical equipments in hospitals selected in Tehran using hierarchical analysis. All research community was 645 persons from members of medical equipment committee and users of medical equipments (including authorities of clinical and Para-clinical wards) in Tehran hospitals. Descriptive and analytic statistics and Excel and Expert Choice were used for data analysis. Results revealed that quality with weight of 0.414 was the first priority effective on purchase of medical equipments. After sale services with weight of 0.278, the brand name with 0.160 and the price with weight of 0.148 were other priorities for purchase of medical equipments (S Tourani, 2013).

**METHODOLOGY**

This is a descriptive-qualitative study that was conducted in three stages. In the first stage, researchers provided a list of effective indices on outsourcing and transferrable therapeutic units by studying theoretical basics and background of health service outsourcing and views of experts. They obtained 15 sub-criteria, 6 main indices (table 1) and 6 transferrable units (table 2) and hierarchical structure.

**Table 1:** General criteria and sub-criteria of outsourcing.

Main criteria	Sub-criteria
Performance monitoring	Controlling the contents of the contract
	Controlling the type and quality of services
	Confirming technical qualification of contractor
Management of human resources	Lack of governmental and working human resources
	Applying human resources of outsourced units in development of new units
Public access to services	Starting a new unit
	Development and variety of services
	Increasing shifts for presenting services
Satisfaction	Satisfaction of employer
	Satisfaction of customer
Quality of services	Increasing quality and quantity of services
	Increasing personnel power
	Increasing quality of materials
Economic	Increasing revenue of the unit
	Reducing costs of the unit

**Table 2:** Transferable therapeutic units based on views of experts.

Row	Transferrable therapeutic units
1	Pharmacy
2	Physiotherapy
3	Laboratory
4	Radiology
5	Injection and bandage
6	Dentistry

In the second stage, the questionnaire of pairwise comparison of indices and transferrable units was prepared and completed by 15 top managers of universities and experts in health service outsourcing and since the questionnaire was prepared by view of the same experts and it is only designed for pairwise comparison among items, the validity and reliability are not required. In order to fill pairwise comparison matrix, the scale between one and nine was used to determine the relative importance of each unit compared to others units.

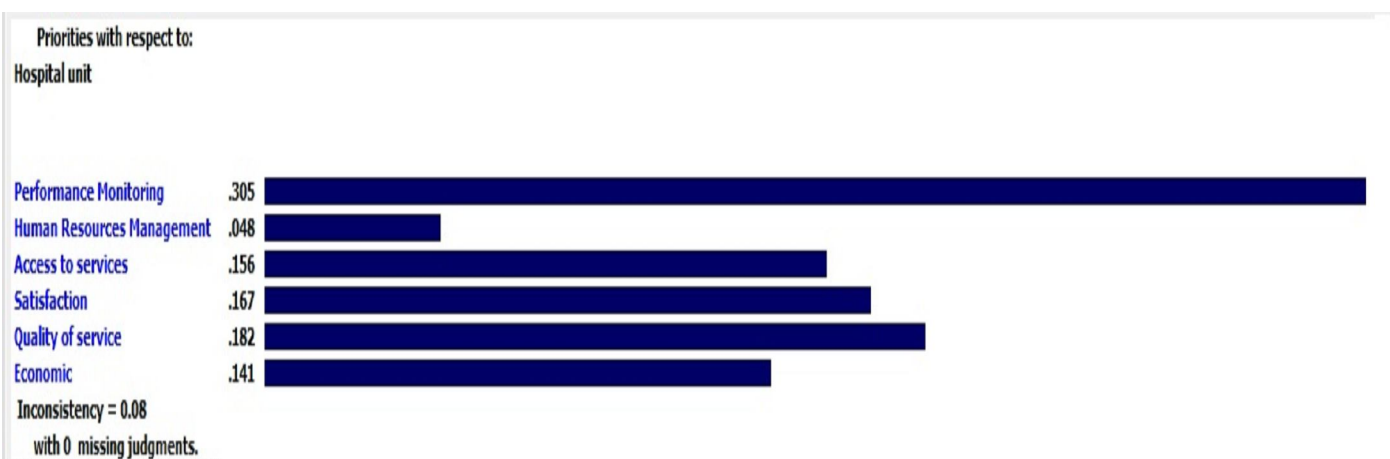
In the third stage, indices and transferrable units were analyzed and ranked using EXPERT CHOICE software. After completion of pairwise comparison matrix by experts, following algorithm was used to implement this method:

- A) Normalization of paired comparison matrix
- B) Obtaining mean geometry of each row of normalized pairwise comparison matrix (that are called relative weights)
- C) Multiplying relative weights of indices by geometric mean of options
- D) Ranking options

**Table 3:** Pairwise comparison of general criteria of outsourcing.

General criteria	Performance monitoring	Management of human resources	accesses to services	Satisfaction	Quality of services	Economic
Performance monitoring	1	8	2	2	2	2
Management of human resources	1.8	1	1.4	1.3	1.3	1.2
Public accesses to services	1.2	4	1	1	1.3	2
Satisfaction	1.2	3	1	1	1	2
Quality of services	1.2	3	3	1	1	1.2
Economic	1.2	2	1.2	1.2	2	1

**Table 4:** Inconsistency rate of paired comparison of general criteria.



**FINDINGS**

Concerning statistical analysis, research findings are shown in tables as follows (Table 3). Table 3 shows relative importance of general criteria of health service outsourcing from view of experts. Inconsistency rate of pairwise comparison of criteria is 0.08 showing the accuracy of pairwise comparison (table 4).

After comparing main criteria of health service outsourcing, sub-criteria were compared in pair. Then, different methods were used to calculate relative weight of criteria and four methods were expressed by professor Saaty as follows: 1- row sum 2- column sum 3- arithmetic mean and 4- geometric mean (Saaty, 1996). In this paper, geometric mean has been used and criteria are normalized to calculate their relative weight. For normalization of criteria, at first, their geometric means are added then geometric mean of each criterion is divided by the obtained number. Relative weight of general criteria and sub-criteria has been calculated.

After determination of relative weight of criteria and sub-criteria and in order to determine relative weight of options,

**Table 5:** Relative weight of general criteria.

Criteria	Geometric mean	Normalized weight
Performance monitoring	1.833	0.305
Human resource management	0.563	0.048
Access to services	1.034	0.156
Satisfaction	1.147	0.167
Quality of services	1.106	0.182
Economic	0.916	0.141

**Table 6:** relative weights of options in each sub-criterion (therapeutic units)

Criteria and sub-criteria	Performance monitoring		Human resource management		Access to services		satisfaction		Quality of services		Economic				
Options (transferrable therapeutic units)	Controlling the content of contract	Controlling the type and quality of services	Confirming technical qualification of the contractor	Lack of governmental working human resource	Using outsourced units as governmental resources	Starting a new unit	Development and variety of services	Increasing shifts for presenting services	Satisfaction of employer	Satisfaction of customer	Increasing quality and quantity of equipments	Increasing personnel power	Increasing quality of materials	Increasing revenue	Reduction of costs
Pharmacy	0.043	0.076	0.314	0.118	0.109	0.082	0.055	0.234	0.155	0.124	0.063	0.076	0.288	0.288	0.125
Physiotherapy	0.207	0.251	0.180	0.079	0.061	0.163	0.122	0.082	0.303	0.083	0.213	0.177	0.229	0.229	0.080
Laboratory	0.081	0.086	0.089	0.308	0.208	0.181	0.347	0.176	0.066	0.206	0.244	0.098	0.094	0.094	0.306
Radiology	0.081	0.103	0.108	0.249	0.120	0.182	0.230	0.124	0.159	0.125	0.282	0.210	0.169	0.169	0.166
Injection	0.341	0.325	0.106	0.181	0.402	0.188	0.070	0.264	0.219	0.342	0.085	0.324	0.134	0.134	0.099
Dentistry	0.246	0.159	0.203	0.066	0.100	0.204	0.149	0.119	0.098	0.120	0.113	0.115	0.087	0.087	0.223

**Table 7:** Ranking options (therapeutic units) in each criterion.

Criteria and sub-criteria	Performance monitoring		Human resource management		Access to services satisfaction		Satisfaction		Quality of services		Economic	
	Final weight	rank	Final weight	rank	Final weight	rank	Final weight	rank	Final weight	rank	Final weight	rank
Pharmacy	0.195	4	0.117	4	0.156	5	0.131	4	0.148	4	0.180	4
Physiotherapy	0.199	3	0.076	5	0.119	6	0.131	4	0.201	3	0.095	5
Laboratory	0.086	6	0.294	1	0.196	2	0.175	2	0.119	5	0.224	1
Radiology	0.099	5	0.232	2	0.158	3	0.133	3	0.206	2	0.197	3
Injection	0.211	1	0.210	3	0.215	1	0.315	1	0.221	1	0.095	5
Dentistry	0.210	2	0.070	6	0.157	4	0.115	5	0.105	6	0.208	2

**Table 8:** Final weight and rank of options (therapeutic units) in all outsourcing indices

Options (transferrable therapeutic units)	Final weight	Rank
Injection	0.231	1
Pharmacy	0.164	2
Dentistry	0.160	3
Laboratory	0.156	4
Radiology	0.155	5
Physiotherapy	0.153	6

the scores obtained by experts were normalized for column sums then their relative weights were calculated (table 6). After determination of relative weight of options, each criterion was weighed and ranked (table 7).

After determination of options for each criterion, their weight and rank were obtained from addition of importance of indices plus weight of options (table 8)

#### CONCLUSION

In past, outsourcing was used when organizations were not able to act well or when they were weak in competition and faced many problems. But today, successful organizations emphasize on outsourcing as one of successful strategies for development of key capabilities, fulfillment of customer's requirements and long term successes (Khalili far.S.O, 2014). Today, hospitals try to outsource supportive, service and therapeutic units. Prioritization of transferrable services in health & treatment system (concerning limitation of sources) is the successful factor in outsourcing of health services. Concerning current facts and lack of prioritization of therapeutic units, the present paper has tried to prioritize transferrable units and indices outsourcing by using available literature and views of experts. By reviewing results and using hierarchical analysis, it was evident that index of performance monitoring was the most important in outsourcing and injection unit had the highest priority for transfer compared to other units. In order to control well the outsourced activities, outsourced tasks or projects should be determined clearly and if any ambiguity, service suppliers should help provide standards (Petrick, 1996).

Followings are suggested:

- 1- By preparing bylaws and circulars, ministry of health, treatment and medical education should announce universities about prioritization of transferrable units with the method of transfer and conditions of contract.
- 2- Courses of familiarity with concepts and advantages of outsourcing in different levels of university (top managers, hospital managers and other personnel) should be held.

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