Comparison of Efficiency in Kashan Medical Science University Hospitals, Using Indicators of Hospital Efficiency: 2010-2011

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ABSTRACT

Background & purpose : Hospital , as one of the main organizations to provide healthcare services , has an important role in economy and health systems of the society and to optimize its efficiency as an economic enterprise , comparison of hospital efficiencies using key indicators of hospitals , in order to plan the required policies in healthcare section is very important.
This study has been done to compare the key efficiency indicators of kashan medical science hospitals using Pobon Lasso graph.
Study methodology : The present descriptive study was carried out in a sectional and retrospective view in 2010 and 2011. The population included six hospitals of kashan medical science university. Indicators of hospital bed occupancy rate , bed turnover rate and average of hospitalization rate were selected to study the efficiency of hospitals and were obtained by referring to healthcare assistant of Kashan medical science university and studying monthly activity of the hospitals and their comparison during 2011 and using Excell & Pabon Lasso programs(Nazar,1999).
Findings : From six hospitals under the study in 2010 , one was located in the second region, three were located in the third region, one was located in the fourth region and in 2011, two were located in the first region, two were located in the second region , two were located in the third region and 0 was located in the fourth region of Pabon Lasso graph.
Result : In order to study the efficiency of hospitals, managers can compare the main indicators of hospital efficiency by using Pobon Lasso graph. It`s recommended that managers indentify the problem by this way and analyze and evaluate their hospital efficiencies in order to plan their efficiency improvement.
KEY WORDS : Hospitals; Length of Stay; Inpatient; Bed Occupancy.

INTRODUCTION

Hospital, has an important role in economy and healthcare system of a society , as one of the main organizations providing healthcare services.

This importance increases more, especially in developing countries, regarding to their economic infrastructures and their immense vulnerability meeting the fluctuations of money and goods markets.

The main problem to provide healthcare services is its economic aspect and hospitals assign 2 percent of GDP in our country (Abedi, Ansari ;2002). Operational costs of hospitals and also inefficiency of healthcare sections raised questions in the field of how to consume resources by hospitals (Aboulhallaje; 1998). Each health system has four main efficiency fields containing stewardship, service provision, resource generation and health financing. In health system management, the field of efficiency of financial resources is presented as one of the discussions specially in hospitals (Musgrove; zeramdini, Carvin;2002). Efficiency evaluation by means of nonfinancial indicators is of the subjects which has been considered during 1990's. These kinds of indicators have many advantages, for example they are more conceivable in comparison with financial indicators and are more compatible with purposes & strategies of the organization and are changeable or flexible according to the environment circumstances during the time (Medori, Steeple ;2000). Like many new research fields, growth & development in the field of efficiency evaluation have been carried out in a high speed and many modern approaches have been observed (Marr, Schiuma; 2003). Although each of these frameworks has their own limits or advantages, one of common limits among all these models is that they have presented little guides about how to choose and apply efficiency indicators.

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One of disadvantages of all these approaches, is the existence of an extensive range of indicators to apply in organizations (Medori, Steeple;2000). Economic attempts have been always focused on obtaining maximum results by the minimum facilities and factors(Kavousi,2005).

This tend can be called achievement to a higher efficiency. Efficiency is a comprehensive concept and its increase to improve level of lifestyle and welfare, convenience of humans, have been mostly considered by politicians and economists. Some people regard stability and permanence of a political and economical system depending on its efficiency and function (Yaisawarng,2005).

Healthcare section is very significant in terms of economic and social development and also distribution of welfare facilities. Inefficiency and ineffectiveness of services, not only decrease lifestyle level but also prevent improvement and efficiency in other economical sections, increase social injustice and inequality and finally political problems, so healthcare section is regarded as one of the most important service provision sectors and one of the indicators of social development and public welfare and recognition of economical issues of this section is very important (Sadaghiani,2005). Efficiency is the most important and ordinary approach to evaluate and measure performance of an enterprise such as hospital, so during the last decades; studying the performance of different economic departments or enterprises in minor level through measurement and estimation of performance have been always considered by researchers of different scientific knowledge such as social science specially in the field of management and economy. Since performance and efficiency improvements are of the important factors of economic growth, this field should be analyzed in healthcare section (Marandi,2003).

By removing related factors to inefficiency of hospitals, efficiency can be increased without adding production factors and service provision can be raised also. Also, hospital managers can be aided to make better and more real decisions. Efficiency is defined briefly as the maximum consumption of resources to produce better output(Tofighi, Zaboli,2003).

To determine efficiency or inefficiency level, each enterprise should apply suitable indicator or some indicators as comparative indicator(Ebadiazar,1999). Studies show that there are different indicators to measure efficiency of hospitals of which the most important and applicable is three indicators of bed occupancy rate , bed turnover rate and hospitalization average time in hospitals .Bed occupancy rate is defined as the occupied beds and is calculated as the ratio of day bed occupancy to the active bed, during a defined period . If this ratio is multiplied by 100, bed occupancy percentage is obtained. This indicator, as a general guide about consuming resources of hospitalization departments has the most application in comparison with other efficiency indicators of hospitals (Roholamin,Parvin,2007).

The most appropriate bed occupancy rate in most hospitals was obtained between 85 to 90 percent and 10 to 15 percent left beds were being repaired, or the bed sheets were being prepared for next patients(Abtahi, Kazemi,2005).

Ratio of bed turnover rate is the number of times that the patients use a bed during a defined period. This rate shows number of occupied and empty beds and shows the average number of patients who use a specified bed during a defined period(Tangen, 2004). Average time of hospitalization or average length of stay determines the ratio of total day occupancy during a defined period to the number of released or died patients during that time.

Length of hospitalization shows medical decision about the patient stay time in the hospital. Social problems of patients, unpleasant specialized services, lack of facilities, diagnosis devices failure and etc… can increase length of stay. In most general hospitals in which acute patients are accepted, average length of stay varies between 8 to 15 days. Since measuring efficiency evaluation of the hospital by important efficiency indicators is of the active methods to recognize this issue, its measuring and comparison within the country has been the subject of different studies. Some of them has compared hospital efficiencies by measuring the mentioned indicators(Mazhari, Ghoudarzi,2005). Pobon Lasso graph is one of the techniques which can compare the above indicators simultaneously(Sohrabizade,2005).Using this graph, one can evaluate hospital efficiencies and compare them. On the horizontal axis of this rectangular graph, bed occupancy rate and on the vertical axis, bed turnover rate (bed output) is located. If the acceptable average of bed occupancy rate is 55% and bed turnover rate is 35 times a year, vertical and horizontal parallel lines of these averages will divide the rectangle into four parts.

On this way, Pobon Lasso graph is applied to evaluate efficiency in hospitals under the study, using key efficiency indicators during 2010 and 2011.

STUDY METHOD

The present descriptive study has been done in a sectional & retrospective view in 2011 . Six hospitals and training healthcare centers of Kashan (shahid Beheshti, Naghavi , Matini , Akhavan, Seyedo shohada & shahid Rajaii of Aran & Bidgol) form the population of this study and regarding to the limitation of hospital number and healthcare training centers, no sampling was carried out.

In this study, in order to achieve coordinated , exact and up dated information, first, the calculation formula were obtained to determine the efficiency indicator.

In this study, relative bed occupancy rate from day bed occupied, to the active day bed in a defined period which multiplied by 100, was measured. Bed turnover rate was measured by the formula of the number of died

or released patients ratio in a defined period to the average prepared bed during that period and the average length of stay was also obtained by the total number of day occupied bed in a defined time to the number of released and died patients during the same time. Then, by referring to the treatment assistance department of Kashan medical university and using forms of monthly activities of the centers, study data obtained for 2010 & 2011. The collected data were analyzed by Excell and Pobon Lasso graph plotting soft wares.

FINDINGS

Data Analysis showed that the maximum bed occupancy rate in 2010 and 2011 was 90.8 & 89.6 % , respectively and the average bed occupancy rate during 2010 and 2011 was obtained 55%.

Maximum bed turnover rate during 2010 & 2011 was obtained 120 and 121.1 days, respectively and minimum was 2.2 days in both years. Average hospitalization time in 2005 & 2006 in the hospitals was obtained 5.4 days. In comparison with the above indicators, by using Pobon Lasso graph , the data showed that from total 6 hospitals under study in 2010 , one center was located in the first region , one center in the second one , three centers in the third one and one center in the fourth region of the graph. And in 2010, two centers were located in the first region, two ones in the second region, two ones in the third region and no center was located in the forth region of Pobon Lasso graph (graph 1 & 2).

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Graph 1: Performance of hospitals in 2010

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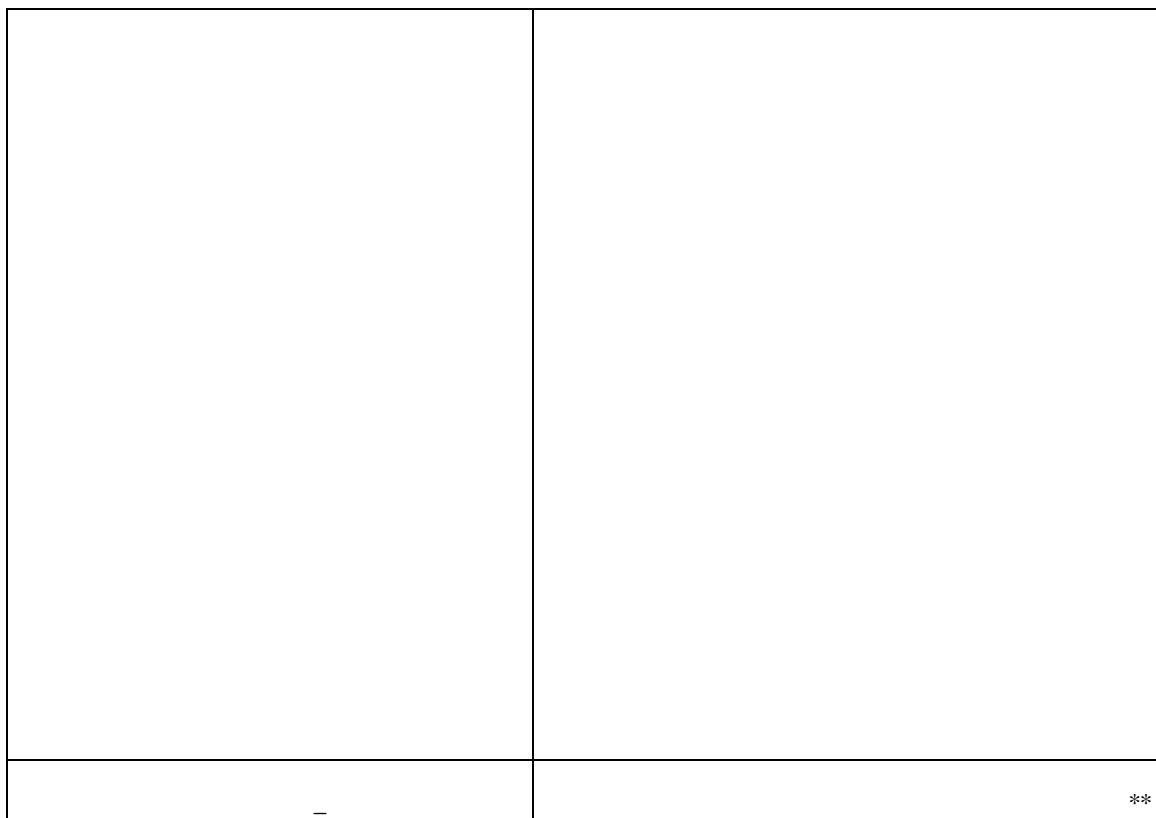
Graph 2: Perfprmance of hospitals in 2011

Regarding to this fact that center movement toward north-east or toward the region is pleasant and shows the better efficiency , two centers have had improvement in efficiency in 2011 compared to 2010 among the studied centers. This improvement which is one of position changing toward the third region, is of the cases to move toward north-east region. In changing success of centers in the quadruple regions, one of the centers has been moved from the forth toward the third region.

CONCLUSION AND DISCUSSION

In this study , it's been tried to compare the most important hospital indicators in order to evaluate their efficiencies using Pobon Lasso graph . To do this , after choosing three indicators of bed occupancy rate, bed turnover rate and average hospitalization time as the most important indicators of hospital efficiencies , rates of these indicators were measured and obtained according to the same formula and for a determined time. Regarding to the relation among the three indicators , simultaneous study of the obtained indicators can be a guide to determine the center status. It should be mentioned that in determining and studying this status making sure about the indicator validities and their measurement accuracy to do evaluation & correct judgments , is essential.

And any fast and incorrect conclusion should be avoided, as well. If the minimum bed occupancy coefficient is assumed 55% and the pleasant goal to be achieved is equal to 75%, the comparison of average bed occupancies in studied hospitals with the acceptable standards showed that status of hospitals is not desirable in this indicator. Insufficient desirability of bed occupancy coefficient indicator was also mentioned in performance reports of the center covered by university . Regarding to this fact that attempt to improve efficiency and performance is of the present priorities of health section, and specially in hospitals, plans should be executed to increase this indicator , by recognizing the most important causes of low bed occupancy coefficients. As similar , if the minimum bed turnover rate is 35 times, bed turnover rate in 85% of centers was obtained more than 35 times. This rate was obtained 70% ,compared to the present standards. And the desirable status of these centers was shown in this indicator. Also , average hospitalization time in comparison with the standard , which is not recommend more than 3 days, showed the desirability of this indicator. Comparison of locating the studied center in the quadruple regions of Pobon Lasso graph showed that , in 2010 , 17% centers were located in the first region which increased up to 34% in 2011. Since location of the hospitals (or centers) in the first region of the graph shows percentage of occupancy and bed turnover rate , lower than the average acceptable rate and therefore , lower efficiency of the center. This increase can suggest that the center

management has been inefficient to utilize the resources and the efficiency has declined. Similar studies in the country showed that percentage of centers which located in the first region of the graph was 0 in Shiraz , Kerman and Semnan and was 36 in Mazandaran .

In addition, compared to the results obtained from similar cases out of the country, this percentage was measured 20 and 23 for district and region centers, respectively. In this study, the second region of the graph in 2010, included 17% and in 2011 included 34% of the hospitals.

This value was obtained 25% for Shiraz center , 25% for Kerman, 0% for Semnan & Mazandaran and 7% & 15% for district and region centers out of the country , respectively. The second region of the graph belongs to those centers which have high bed turnover rates because of their special activities (such as short time hospitalization centers or obstetrics and gynecology hospitals). Hence , if a center is localized in this region with the above circumstances , it can be said that it has been efficient , so we can say except these centers , other ones haven`t had acceptable efficiency to manage the affairs and it is recommended that their management should try to improve efficiency indicators and move toward the third region in the graph. In 2010, 15% of the studied centers were located in the third region of the graph which decreased to 34% in 2011. Percentage of centers located in this region, was 50 for Shiraz and Kerman, 0 for Semnan , 9 for Mazandaran , 40 for the district hospitals out of the country and 28 for the region hospitals out of the country. The third region of the graph contains hospitals which have good efficiency. In this study, the hospitals could have absorbed more patients in addition to use maximum resources , using correct planning , as they had special healthcare services ,a good fame and medical, paramedical and administrative staff and as they used advanced facilities and medical technologies , modern management methods or easy access. However , this does not mean sufficient attempts for better efficiency as efficiency improvement is an approach which can't be considered as a maximum level or value , hence, continuity in movement toward efficiency improvement in hospitals , in order to increase percentage of hospitals located in the third region and also changing the hospital positions toward north east of the graph , should be regarded as an important priority for managers. As the study results showed, neglecting this issue resulted in decrease for the percentage of hospitals located in this region in 2011. This decrease was because of change in location of a hospital toward the second region. Oldness of the centers, inactivation of many departments, existence of competent hospitals, lack of programming how to consume resources and lack of management stability of the hospital were of the factors which interfered with undesirable efficiency. For this reason , it is recommended that regarding to the preparedness of this center to provide various services such as obstetrics & gynecology, pediatrics, infants, kidney and urinary tract , ear , nose & throat, neurosurgery , orthopedics , internal, heart , neurology departments, they should try to improve efficiency indicators and hence performance improvement. The last region of Pobon Lasso graph in this study in 2010, contained 14% of centers and in 2011, 0% of the centers. This value was obtained 25, 100 and 55% (for Shiraz, Kerman, Semnan and Mazandaran , respectively) and was obtained 33% and 34%, (for district and region hospitals out of country, respectively).

The forth region contained centers which had high bed occupancy rate , low bed turnover rate , low efficiency and high costs (long time hospitalization centers such as centers for elder or psychotherapy).

In this study, one center which was located in the forth region , belonged to the centers provided treatments to mental disease patients. Although, because of the nature of these centers activities, region change can't be expected, efficiency improvement in this region and therefore, location change (movement toward northeast of the graph) is expectable and was considered by the managers. The following studies showed that fortunately, by using management strategies and legal opportunities provided (specially announcement of article 88 of forth plan law of economic, social and cultural development, efficiency improvement was observed in management of these centers, so that one center located in this region, was moved toward the third region. It is noted that because of difference in conditions and position of the centers, absolute conclusion about comparison of hospitals efficiencies of this study in the similar studies is not possible.

Pobon Lasso graph is a tool by which evaluation of the centers after regarding efficiency in management of affairs is done, in addition to simultaneous comparison of hospital indicators. This method which is one of the active methods to recognize hospital problems enables the management to analyze its position by getting help from three key indicators of hospital efficiency. Position determination is itself a useful guide to plan efficiency improvement.

According to the obtained findings, the following suggestions are presented:
- Attempts to make common literature to measure indicators and use valid instructions and methods to determine efficiency indicators.
- Defining important indicators of hospital efficiency and its periodic results.
- Using the study's results to plan and make policies.
- Attempts to increase utilization rate from hospital resources and prevent to waste resources.
- Periodic comparison of hospital performances and determination of succeed or lack of succeed factors.

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