



Comparison of Hospital Efficiency and Performance Indices before and after the Implementation of Public-Private Partnership Model (PPP): A Case Study of a Public Hospital in Iran

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Abstract

Background and Objectives: Public – Private Partnership can increase the efficiency of health care in hospitals that is the main aim of a good management in a healthcare sector. The purpose of this study was to investigate the performance and the efficiency indices of important wards of Hasheminejad Kidney Center as a public hospital from 2004 to 2012 in order to measure the advantages of this partnership.

Methods: This practical and cross-sectional study was performed in winter 2014. The performance and efficiency indices (2004-2012) were calculated and drawn in Excel software. Then, the researcher investigated the causes of increasing or decreasing of indices and analyzed them based on the evidences.

Results: It was shown that the performance and efficiency indices were increasing during these years, and the causes of the slight decrease in some cases were investigated.

Conclusion: It was concluded that all hospitals by applying some model of partnership will be able to change their hospitals, if they apply this partnership systematically and based on the scientific and experimental model.

Keywords: Public-Private Partnership, Efficiency, Performance, Hospital, indices, Hasheminejad Kidney Center

Background and objective

Many countries around the world, particularly those with transition economies face weak infrastructure including crowded roads, old transportation system and facilities, old schools and hospitals, old water purification systems and other infrastructures that are needed to build, rebuild or repaired. Each of these problems can reduce the heavy costs of productivity and competitiveness, increase the number of accidents, health problems, and subsequently reduce the life expectancy¹.

Today, on the one hand, the public investment and management for development of public services that healthcare is one of them, is not sufficient, and on the other hand, the capacity of the private hospitals is unlimited. In the present century, the economic growth and development, to a large extent, is related to the partnership with the private sector in financing, management and risk taking to provide public services and it seems that this partnership is interesting for private sectors².

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In developed and developing countries, hospitals are considered as the vital and necessary social resources that should be managed according to the interests of the society. Poor management of hospitals and lack of quick impact strategy for management of this great organization lead to improper utilization of the resources such as money, human resources, buildings and facilities. Such waste means that providing a certain level of services or outputs could be achieved with fewer resources. By providing necessary and proper resources and reducing waste of resources, the quality of hospital services can be improved^{3,4}.

According to the experts, by applying Public – Private Partnership and reforming the inefficient management methods in hospitals, about 44 percent of non-personnel costs of public hospitals can be reduced⁵.

Accordingly, the private sectors with the aim of maximizing profits and economic growth could resolve the finance problems in the public sectors, and also with risk taking of private sectors could provide new services and opportunities for public sectors to use better and more efficient facilities and establish marketing management to achieve higher incomes. Therefore, public sectors by using private sectors' investment, facilities, management and also employing their own experienced experts and financial supports and academic activities can reduce the challenges of investment and management, and increase the performance and efficiency indices^{6,7}.

The ultimate goal of a good management in healthcare sectors is to increase the productivity of health care services, which can be achieved by a set of measures related to the efficiency and

effectiveness including shortening hospitalization, prevention of hospital infections, prevention of diseases, increasing health care services, raising knowledge of public about health, prevention of injuries and financial losses, protecting the facilities of hospitals and health care centers, and finally, providing an acceptable medical and economic order. It seems that by Public – Private Partnership, the mentioned goals would be easy to reach⁸.

This study was performed to evaluate the advantages of the partnership of the private sector with Hasheminejad Kidney Center as a public sector. Hasheminejad Kidney Center as a public sector began its partnership with a private sector (Private Institute of Moheb) in 2002, and in 2009, signed its partnership contract with a private hospital (Hospital of Moheb) which was extended from that private institution.

Hasheminejad Kidney Center that was going to be bankrupted before applying its partnership with the Private Institute of Moheb, improved its performance through the advantage of this partnership; therefore, in order to assess the advantages of this partnership, the performance and efficiency indices of the main wards of the hospital from 2004 to 2012 were investigated.

Methods

Study Design and Data Collection

This practical and cross-sectional study was performed in winter 2014 to assess the advantages of the partnership of Hasheminejad Kidney Center as the sample of the study with a private sector. In this study, the significant indices of performance and efficiency of the main wards of the hospital (2004 - 2012) were collected and analyzed.

Data collection tool

The performance and efficiency indicators during 2004 to 2012 were calculated and their proceeding charts were drawn in Excel software. The indices examined in this study are presented in Table 1.

Data Analysis

Therefore, the researchers investigated the causes of increase or decline of indices, and analyzed the data based on the evidences.

Ethics

An approval of the quality management office at Hasheminejad Kidney Center was obtained for gathering the data and conducting the study.

Table 1: Performance and efficiency indices used in the study.

Types of Indices	Indices	The formula for Calculating the Indices
Performance	The average hospitalization	Total hospitalization / the total hospitalized patients
	The percent of death after 24 hours	The number of deaths after 24 hours / the total discharges and deaths * 100
	The number of admission	The number of inpatient and outpatient admissions during the specific years
	Satisfaction of personnel	Percent of personnel satisfaction through assessment of indices approved by the hospital
	Satisfaction of patients and their relatives	Percent of patients satisfaction through assessment of indices approved by the hospital
Efficiency	Per capita performance of surgery to the surgeons	The number of surgical operations / the number of surgeons
	The per capita performance of radiology to the radiologist	The number of radiographs / the number of radiologists
	The per capita performance of clinic to the personnel of the clinic	The number of hospitalized patients / the number of personnel of the clinic
	The per capita performance of the laboratory to the personnel of the laboratory	The number of tests / the number of personnel of the laboratory
	The per capita performance of Nuclear Medicine to the personnel of the Nuclear Medicine	The number of hospitalized patients / the number of the personnel in nuclear medicine
	The per capita performance of ESWL to the personnel of ESWL	The number of hospitalized patients / the number of the personnel of ESWL

Results

The data related to the performance and efficiency indices from 2004 to 2012 were collected and analyzed. Some of these indices are shown in Figures 1-6 and in Table 2.

As can be seen in the figures, the efficiency of surgery ward was increasing since 2005 to 2013 and the highest increase in this ward was seen during 2009 to 2010. It should be noted that the efficiency was increased while the per capita number of surgery and the number of personnel were increased. The

efficiency of radiology and laboratory also has been increased over these years.

The performance of clinic, nuclear medicine and ESWL were also increasing but the efficiency of the clinic in 2007 was slightly declined compared to that in 2006, the efficiency of nuclear medicine in 2010 compared to 2009, and in 2012 compared to 2011 was slightly reduced. In addition, the efficiency of ESWL ward was slightly reduced in 2010 but as it can be seen, the efficiency of these wards was increasing.

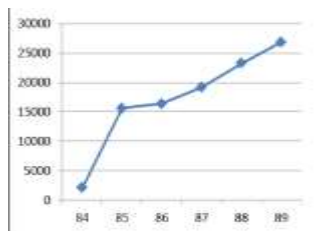


Figure 3. Per capita performance of laboratory to the personnel of the laboratory.

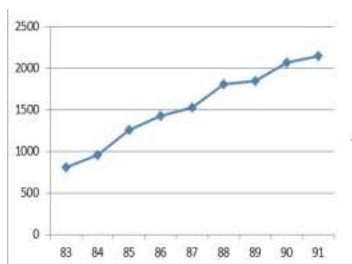


Figure 2. Per capita performance of radiology to the radiologist.

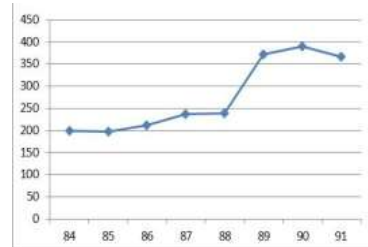


Figure 1. Per capita performance of surgery to the surgeons.

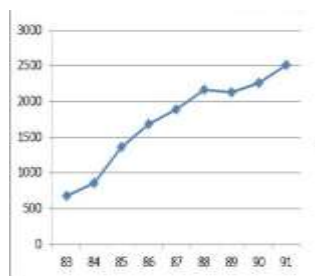


Figure 6. Per capita performance of ESWL to the personnel of the ESWL.

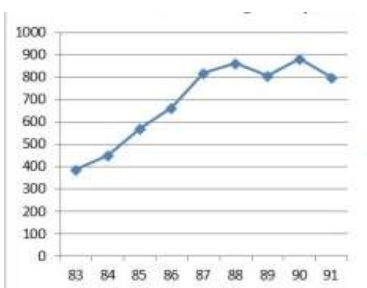


Figure 5. Per capita performance of nuclear medicine to the personnel of the nuclear medicine.

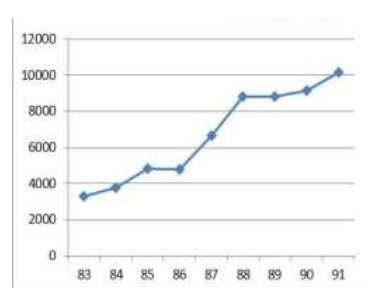


Figure 4. Per capita performance of clinic to the personnel of the clinic.

Table 2: Performance indices of Hasheminejad Kidney Center.

Years	2004	2005	2006	2007	2008	2009	2010	2011	2012
Average Hospitalization	7.6	7.2	6.1	6	5.1	5.1	5.1	4.4	4.4
Percentage of death after 24 hours	%2.35	%2.56	%2.23	%2.17	%2.17	%1.67	%1.80	%1.48	%1.46
Number of hospitalized Patients	4175	4368	5555	6364	6661	7611	8406	8890	8426
Satisfaction of personnel	48	58	50	72	72.5	79	79	77.5	75
Satisfaction of patients and their relatives	-	73.8	74	75	82	86	90	73.8	85.1

Discussion

After applying the Public- Private Partnership (2004- 2012), 2 years after hospitals evolution (2002), the performance and efficiency indices of the main wards of the hospital was increased. The similar development can be observed in other hospitals that tried to reform and establish their structural strategies⁹.

The average hospitalization index was desirably decreased in Shahid Beheshti Center that can be due to effective redefining of the hospital process providing better and timely services for the patients, the main causes for the Public- Private Partnership, because due to this partnership, by financial support of private sector and proficiency of the public sector, the necessary measures for rearrangement of clinical processes and increasing the quality of services was performed.

Confirming this study, Golaghayy et al., in their study reported that providing high level services for patients lead to shorter hospitalization because patients can be treated in the shortest time¹¹.

Percentage death index after 24 hours in 2004 to 2013 has been decreasing indicating that the problem of structural

deterioration of hospital was resolved and hospital infection during the Public-Private Partnership was controlled¹².

In fact, Hasheminejad Kidney Center using private sector investment could rebuild the old wards of hospital, apply the best engineering design, and purchase medical equipment strategically.

As the surgery performance index to the surgeon was increasing in 2004 to 2013, it can be concluded that providing perfect cycle of kidney and cardiovascular health services by using the private sectors proficiency was effective in increasing the surgeries and reducing hospitalization. Therefore, the private sectors proficiency beside public proficiency was effective in complementing the healthcare cycle. However, training of surgery wards personnel, employing the physicians of the other hospital for training or cure even in hours outside official positions, were effective for increasing the efficiency and improving the quality of services¹³.

As findings show, surgery efficiency was slightly dropped in 2009 compared to that in 2008 possibly due to the construction of Moheb hospital and the

effort of the personnel of the surgery ward to organize this ward.

The efficiency of laboratory, radiology and ESWL from 2005 to 2010 was increased while the number of personnel was stable and the number of services was increased that can be due to the possibility of purchasing modern equipment and application of professional standards of services and improving service spaces by financial support of private sector, the possibility to take the advantage of basic and supplementary insurance for patients of both hospitals, and subsequently, reducing the patients payment and increasing the patients who referred from Moheb hospital to Hashemi hospital if they needed paraclinical services.

The efficiency of the clinic was increasing in 2004 to 2012, in other words, by stability of the number of personnel, more patients were admitted each year. In addition, improvement of physical spaces and systems dealing with complaints of patients and also reducing the waiting time of patients have been effective¹⁴.

Therefore, the partnership of Moheb Hospital through funding for spaces, wages and personnel training as well as employing expert physicians working in Moheb hospital for training the personnel and providing healthcare services for the patients, accepting the supplementary insurance financial and services' risks were also effective. However, the efficiency of the clinic were slightly reduced in 2007 compared to that in 2006 that seems to be due to the establishment of the evening clinic and management of its opening.

There was another type of partnership in the ward of nuclear medicine namely as insourcing. Therefore, the increase in efficiency of this ward during these years can be related to the efficient method of

management that management of all costs and providing equipment and human resources of this ward as well as ward's and personnel incomes and regular payment of wards manager of the hospital¹⁵. However, in 2010 and 2011, there was a relative reduce in efficiency that could be due to the decrease in the patients who referred to the hospital.

The number of hospitalization and satisfaction of patients during these years was increasing indicating that this partnership was effective in the hospital.

In general, Public- Private Partnership can provide significant advantages for public sectors including reducing the expenditure of the state by removing the investment from limited sources, increasing the efficiency of private sectors or better management of healthcare services and sub constructions. In health era, this partnership can be considered as an important issue for employing the management skills and technical capabilities such as supervision and performance-based incentives, and also for facilitation of transferring the technology that all can improve the quality of services.

In addition, this partnership can reduce the risks (e.g. private sectors can financially support the project and manage the project schedule). The effective partnership and the mutual interest and proficiency can increase the performance and efficiency indices¹⁶.

Conclusion

Considering the advantages of the Public- Private Partnership in increasing the performance and efficiency indices, it seems that all hospitals managers by applying some systematic, scientific, and experimental models of partnership can make a significant evolution in their hospital.

Abbreviations

(PPP): public-private partnership

Competing Interests

The authors declare no competing financial

Authors' Contributions

FS carried out the study design and revised the manuscript. EA was involved in the study design, gathering the Data, analyzing the data, and drafting the manuscript. MS revised analyzing the data. All authors have read and approved the final manuscript.

Acknowledgements

The authors are grateful to Hasheminejad Kidney Center staff for kindly sharing their viewpoints.

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Please cite this article as:

Fatemeh Semnani, Elham Afzal, Mohsen Shati. Evaluation of Efficiency and Performance Indices in Public-Private Partnership: Case of a Public Hospital in Iran. *Int J Hosp Res*. 2018; 7 (4).