

Effect Of Implementing The Project Of Health System Transformation On The Productivity Of Hospitals Affiliated With The Ministry Of Health, Treatment, And Medical Education In Yazd

Seyed Valiallah Mirhoseyni¹, Mohammad Reza Montazeri², Isa Didadar³

¹Assistant Professor, Department of Economics, Payam Noor University (PNU), P.O.Box 19395-4697, Tehran, Iran., Email: svmir@pnu.ac.ir, Corresponding Author

²Assistant Professor, Department of Economics, Payam Noor University (PNU), P.O.Box 19395-4697, Tehran, Iran., Email: m.r.montazeri@pnu.ac.ir & montazerimr@gmail.com

³Master student of Management of government organizations Economic finance, Payame noor University, Tehran, Iran, Email: id00100@yahoo.com

DOI: 10.47750/pnr.2022.13.04.266

Abstract

In recent years, the health system has achieved considerable improvements in the general level of people's health and its indicators through the primary health care strategy, but one of the most important concerns of policymakers is justice in access to health services. The present study investigates the effect of implementing the project of the health system transformation on the productivity of hospitals affiliated with the Ministry of Health, Treatment, and Medical Education in Yazd. It was conducted during the project in the 2010s, in Shahid Sadouqi, Afshar, and Shahid Rahmonun hospitals affiliated with Yazd University of Medical Sciences. The study was based on the data of the implementation years of the transformation project. It has applied the econometric calculation methods and the regression technique. Its data was collected through document observation and a monthly data extraction worksheet of the Ministry of Health, Treatment and Medical Education, based on the country's hospital statistics and information system. It used bivariate regression and Pearson's correlation coefficient for data analysis, and the SPSS and EXCEL software for calculations. The results indicate that the standardized coefficient (Beta) of the variable of implementation project on hospital productivity is 0.960, the percentage of bed occupancy and bed turnover is 0.852, the patient stay is 0.862, energy consumption is 0.783, the reduction of payment from people's pockets is 0.857 and the attendance of doctors is 0.844.

Keywords: transformation project, health system, productivity, hospital, Ministry of Health and Treatment.

INTRODUCTION

The health system although in recent years has achieved significant improvements in the general level of people's health and its indicators through the primary health care strategy, still one of the most important concerns of policymakers is justice in access to health services (Alizadeh, 2014). Putting it otherwise, the hospital, in most countries, especially developing countries, is a very costly organization. Hospitals consume an important part of the health system resources, and the goal of many reforms in the health system is to improve the performance of hospitals. The principal mission of the health system is to improve the level of health and respond to the needs of society. These needs are constantly changing under the influence of economic, social, and political conditions. Diseases and risk factors are constantly changing and have received very rapid changes, especially in the current period (Toroski et al., 2014).

One of the fundamental developments and changes in the health system of Iran is a project of the health system transformation, the effects of which are examinable from different aspects (Qazizadeh et al., 2017). The transformation project of the health system established supposedly just access to health services. It improves the quality of services in hospitals, and the financial protection of citizens against health costs with a focus on vulnerable groups through the organization of hospital services and reduces the patient's payments in the hospitals affiliated with the Ministry of Health, Treatment and Medical Education. It comprises seven main subjects:

reducing the amount of payment for hospitalized patients, supporting the longevity of doctors in deprived areas, the presence of resident specialist doctors in hospitals, improving the quality of visit services, financial protection of incurable, special and needy patients and promoting natural childbirth (Sajadi and Zaboli, 2016).

Through reducing out-of-pocket payments and programs such as the development of clinics, and improving the quality of visits and the longevity of doctors in deprived areas, the transformation project of the health system has increased the patients' access to medical services, and was beneficial especially for people who, due to lack of financial means, have not continued their treatment. Conditioned by planning sustainable financial resources and adequate human and providing physical resources, the continuation of such projects will be a beneficial step toward the realization of universal coverage of health and justice (Qazizadeh et al., 2017). It will be possible to use a set of indicators such as indicators of access, financing, quality, consequence, and outcome. Among the set of consequential indicators of changes in the health system are hospital productivity and performance indicators (Berman and Bitran, 2011).

The Ministry of Health, Treatment and Medical Education as the custodian of health in the country have started the implementation of the health transformation project after a six-month study phase in May 2014. It followed the general duties and missions and upper documents, especially the 20-year vision document, general health policies announced by the Supreme Leader, legal articles of health in the fifth development program and that of the 11th government. The transformation in the health system is implemented with three approaches of financial protection of the people, justice in access to health services and improving the quality of services. The general health policies announced by the Supreme Leader place a special emphasis on generalizing basic treatment insurance and fully covering basic treatment needs by insurance for members of the society and reducing people's share of treatment costs, so that the patient concerns only his/her illness (Qazizadeh, 2017).

In the last three decades, hospitals have enjoyed significant growth. The increase in the demand for employment in hospitals and the increase in costs and the limitation of financial resources has attracted the attention of policymakers of the Ministry of Health and hospitals to increase efficiency and effectiveness and finally improve productivity. Hospitals receive criticisms such as quality reduction, output mismatch with labor market needs, etc. Responding to such criticisms requires finding new solutions to improve the performance of the Ministry of Health and hospitals.

Despite the achievements of the project of the health system transformation, the lack of sound economic logic has prevented the achievement of the ultimate goals of the project. Some of its positive effects, which were achieved by spending resources, have taken gradually a reverse trend, which requires revision (Mohammadi, 2013). "Reduction of public payments in the government hospital sector", "Reduction of the number of uninsured people", "Protection of vulnerable patients", "Development of natural childbirth", "Improvement of visible assets of the health field" and "Improvement of access to Specialized services" were among the positive effects of the project (Alizadeh, 2014). "Increasing induced demand", "increasing total medical expenses", "increasing the burden of visits to government centers", "increasing the share of health expenses from the household budget", "increasing Dissatisfaction of medical staff because of unfair payments" and "increasing disruptions in the drug supply chain" were among the negative effects of the project (Mousavi Rigi, 2016). The lack of feasibility studies, the lack of sustainable resources for continuation of the project, contrast to upstream policies, conflict of interest in policy-making, priority of treatment over prevention, inefficient management of human resources and low effectiveness of policies belonged to the main challenges of the project (Midari, 2012).

Improvement in performance indicators means efficiency and effectiveness of hospital activities, or better, appropriate use of resources (Arab et al., 2007). This research has examined the effect of implementing the project of the health system transformation on the productivity of the hospitals affiliated to the Ministry of Health, Treatment and Medical Education in Yazd. We are looking for an answer of whether the implementation of the project of the health system transformation has improved the efficiency of the hospitals affiliated to the Ministry of Health, Treatment and Medical Education in Yazd.

Research Method

This study is descriptive and uses the data of implementing the transformation project during the 2010s in Shahid Sadouqi, Afshar and Rahnamoun hospitals affiliated to Yazd University of Medical Sciences. Hospital productivity indicators are the most important factors that show the optimal use of hospital services, which are:

Bed occupancy percentage: Bed occupancy percentage refers to occupied beds, which is calculated as a ratio of

occupied day beds to active day beds in a certain period. If this ratio is multiplied by 100, the result is the percentage of bed occupancy. The mentioned index, as a general guide in the inpatient wards' resource consumption, is the most useful compared to other operational indicators of the hospital.

Bed turnover ratio: The bed turnover ratio is the number of times patients use a hospital bed in a certain period. This rate shows the number of bed occupations and vacancies in a certain period and is an example of the average number of patients who use a certain bed during a certain period.

The average length of hospitalization: The average length of hospitalization or patient's stay is the total number of occupied beds at a time and the number of discharged patients and deaths in the same period. The length of hospitalization reflects the medical decision on the patient's stay in the hospital. The social problem of the patient, the undesired specialized services, the lack of facilities, the breakdown of diagnostic equipment, etc. can cause an increase in the patient's stay in most of general hospitals, which accept acute patients.

Per capita energy consumption: The per capita energy consumption index means determining the amount of consumed energy in the hospital based on the occupied bed. It is supposedly a criterion for calculating the cost of energy consumption in hospitals.

Reduction of out-of-pocket payments: it means that in eligible hospitals, all treatment services, drugs and medical equipment are provided to all patients with health insurance at the lowest cost, and patients pay only 10% of the cost.

Attendance rate of resident doctors: Attendance rate of resident doctors is the number of days that a doctor is physically present from 2:00 AM to 8:00 AM on non-holidays and 24 hours on holidays in medical/educational-therapeutic centers affiliated to the University of Medical Sciences. S/he is active and performs the diagnostic and therapeutic measures required by patients (Mousavi Rigi et al., 2015).

The study's method of data collection is observation of documents. It used it in order to collect data from the sources available in hospitals, which are prepared by the Ministry of Health, Treatment and Medical Education on a monthly basis and approved by the experts. After confirmation, their accuracy is sent to the statistics unit of the universities by the hospital managers. Bivariate regression and Pearson's correlation coefficient were used to analyze the data. SPSS and EXCEL software are appropriate for their calculations.

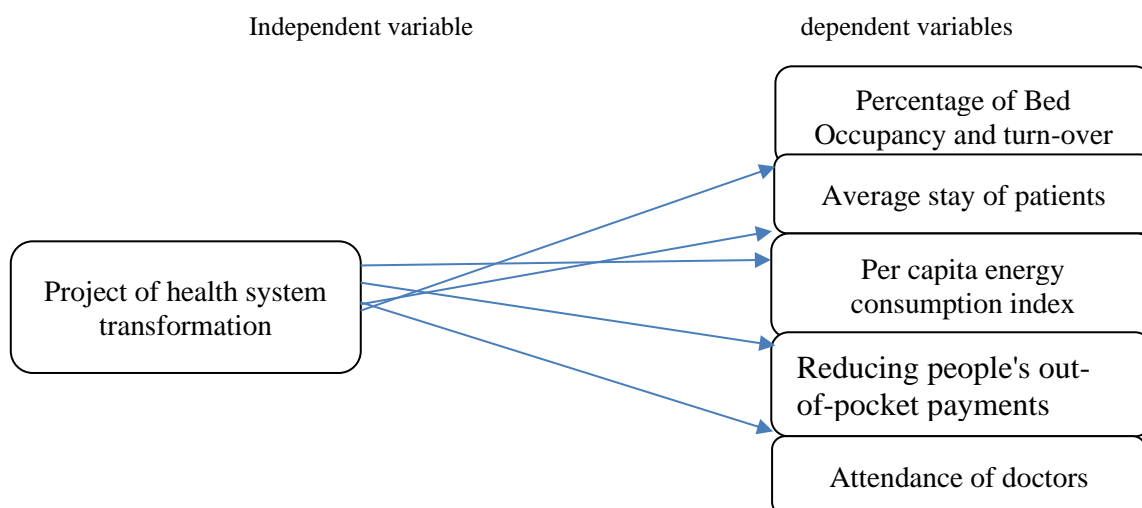


Figure (1): Conceptual model of the research

Findings

According to the subject and objectives of the research, it used the bivariate regression method. The results show that the level of significance is smaller than the level of error. There is a significant relationship between implementing the project of the health system transformation and the percentage of bed occupancy, bed turnover and the average stay of patients. Considering the positive relationship, we can conclude that with the increase in the organization, the percentage of bed occupancy and bed turnover, the patients' average stay increases. There is

a significant relationship between implementing the transformation project of the health system and energy consumption, the reduction of out-of-pocket payments and the attendance of doctors. Regarding the positive relationship, we conclude that with implementing the transformation project, energy consumption, reduction of out-of-pocket payments and attendance of doctors will increase.

Table 1: Results of fitting the regression model of the impact of health system transformation and productivity

Variable	Non-standard coefficient		Standard coefficient	<i>t</i>	<i>sig</i>	<i>R</i>	<i>R</i> ²	<i>Adjusted R</i> ²	<i>P</i>	<i>DW</i>	<i>F</i>
	<i>B</i>	Standard error	<i>Beta</i>								
Fixed coefficient	0.096	0.085		0.121	0.264						
Implementation of the project	0.966	0.024	0.960	40.502	0.0001	0.960	0.921	0.920	0	2.007	1640.373

As Table (1) indicates, the significance level of the regression for the statistic *F* is equal to 0.0001. It shows the significance of the regression at the 95% level. The standardized coefficient (*Beta*) of the implementation variable of the transformation project on hospital productivity is 0.960 and the significance level (*sig*) of the *t* statistic is 0.0001. We can accept that in the statistical population, implementing the transformation project has a positive, strong, and significant effect on the productivity of the hospital. According to the regression beta coefficient, the effect is 0.960. Coefficient of determination (*R*²) of the implementation of the transformation project is 0.960. Consequently, the implementation variable of the transformation project alone explains 96% of the changes in the hospital productivity variable.

Table 2: Results of fitting of the regression model of the effect of the transformation of the health system on bed occupancy

Variable	Non-standard coefficient		Standard coefficient	<i>t</i>	<i>sig</i>	<i>R</i>	<i>R</i> ²	<i>Adjusted R</i> ²	<i>P</i>	<i>DW</i>	<i>F</i>
	<i>B</i>	Standard error	<i>Beta</i>								
Fixed coefficient	0.920	0.137		6.730	0.0001						
Bed occupancy percentage	0.711	0.037	0.852	19.288	0.0001	0.852	0.725	0.723	0	1.918	372.018

As Table (2) shows the results on the bivariate regression analysis test, the significance level of the regression for the statistic *F* is equal to 0.0001 and it shows the significance of the regression at the 95% level. The standardized coefficient (*Beta*) of the implementation variable of the transformation project on the percentage of bed occupancy and bed turnover is 0.852 and the significance level (*Sig.*) of the *t* statistic is 0.0001. Therefore, the effect of implementing the transformation project on the percentage of bed occupancy and bed turnover has been acceptable.

Table 3: Results of fitting of the regression model of the impact of the transformation of the health system on the average length of patients' stay

Variable	Non-standard coefficient		Standard coefficient	<i>t</i>	<i>sig</i>	<i>R</i>	<i>R</i> ²	<i>Adjusted R</i> ²	<i>P</i>	<i>DW</i>	<i>F</i>
	B	Standard error	<i>Beta</i>								
Fixed coefficient	0.735	0.139		5.274	0.0001						
Average stay of patients	0.777	0.038	0.862	20.200	0.0001	0.862	0.743	0.741	0	2.171	408.047

As Table (3) shows the results on the bivariate regression analysis test, the significance level of the regression for the statistic *F* is equal to 0.0001 and it shows the significance of the regression at the 95% level. We can accept that in the statistical population, implementing the transformation project has a positive, severe and significant effect on the average length of patients' stay.

Table 4: Results of fitting of the regression model of the effect of the health system on energy consumption

Variable	Non-standard coefficient		Standard coefficient	<i>t</i>	<i>sig</i>	<i>R</i>	<i>R</i> ²	<i>Adjusted R</i> ²	<i>P</i>	<i>DW</i>	<i>F</i>
	B	Standard error	<i>Beta</i>								
Fixed coefficient	0.998	0.170		5.867	0.0001						
Energy consumption	0.730	0.049	0.873	14.972	0.0001	0.783	0.614	0.611	0	1.738	224.160

Based on the results of Table (4) on the bivariate regression analysis test, the significance level of the regression for the statistic *F* is equal to 0.0001 and it shows the significance of the regression at the 95% level. We can accept that in the statistical population, implementing the transformation project has a positive, strong, and significant effect on energy consumption, and the effect is 0.783 according to the regression beta coefficient.

Table 5: Results of fitting the regression model of the transformation of the health system on the reduction of payment

Variable	Non-standard coefficient		Standard coefficient	<i>t</i>	<i>sig</i>	<i>R</i>	<i>R</i> ²	<i>Adjusted R</i> ²	<i>P</i>	<i>DW</i>	<i>F</i>
	B	Standard error	<i>Beta</i>								
Fixed coefficient	0.962	0.131		7.329	0.0001						
Reducing people's out-of-pocket payments	0.713	0.036	0.857	19.773	0.0001	0.857	0.735	0.733	0	2.411	390.972

Based on the results of Table (5) on the bivariate regression analysis test, the significance level of the regression

for the statistic F is equal to 0.0001 and it shows the significance of the regression at the 95% level. The standardized coefficient (Beta) of the variable of implementing the transformation project on the reduction of out-of-pocket payments is 0.857 and the significance level (Sig) of the t statistic is 0.0001. We can accept that in the statistical population, implementing the transformation project of the health system has a positive, severe, and significant effect on the reduction of out-of-pocket payments.

Table 6: Results of fitting the regression model of the effect of the health system transformation on the attendance of doctors

Variable	Non-standard coefficient		Standard coefficient	t	sig	R	R ²	Adjusted R ²	P	DW	F
	B	Standard error	Beta								
Fixed coefficient	0.775	0.148		5.230	0.0001						
Attendance of doctors	0.778	0.042	0.844	18.709	0.0001	0.844	0.713	0.711	0	2.176	350.036

Based on the results of Table (6) of the bivariate regression analysis test, the significance level of the regression was calculated with the F test. The corresponding level for this statistic is equal to 0.0001, and it shows the significance of the regression at the 95% level. We can accept that in the statistical population, implementing the transformation project has a positive, strong and significant effect on the attendance of doctors. The effect is 0.844 according to the regression beta coefficient.

Discussion

Based on the results of the standardized coefficient (Beta), the variable of implementing the transformation project on hospital productivity is 0.960 and the significance level (sig) of the t statistic is 0.0001. The effect of implementing the transformation project on hospital productivity has been acceptable. We can accept that in the statistical population, implementing the transformation project has a positive, strong and significant effect on hospital productivity. The effect is 0.960 according to the regression beta coefficient. Correlation (R) between implementing the project of the health system transformation and the efficiency of the hospital is equal to 0.960. The implementation variable of the transformation project alone explains 92% of the variance (changes) of the hospital productivity variable. The results are consistent with the research of Ghazizadeh et al. (2016), Mousavi Rigi et al. (2015). In the current situation, hospitals are the most expensive health care sector in the country, and their role in ensuring the care is undeniable. The findings show that the health transformation project has an increasing trend in the percentage of bed occupancy and bed turnover. The average length of patients' stay has also increased. There is also a significant increase in the per capita energy consumption index. The transformation project of the health system has increased the attendance of resident doctors by reducing out-of-pocket payments for patients referring to government centers. Increasing the average length of patients' stay in the hospital leads to problems such as the lack of beds and ultimately the false use of patients. We need more supervision in energy use.

The standardized coefficient (Beta) of the variable of implementation of the transformation project on the percentage of bed occupancy and bed turnover is 0.852 and the significance level (sig) of the t statistic is 0.0001. We can accept that in the statistical population, implementing the transformation project has a positive, severe, and significant effect on the percentage of bed occupancy and bed turnover. The effect is 0.852 according to the regression beta coefficient. The results are consistent with the findings of Dadgar et al. (2016), Rezaei et al. (2015), and Mousavi Rigi et al. (2015).

Therefore, the standardized coefficient (Beta) of the variable of implementing the transformation project on the average stay of patients is 0.862 and the significance level (sig) of the t statistic is 0.0001. We can accept that in

the statistical population, implementing the transformation project has a positive, strong, and significant effect on the average length of the patients' stay, and the influence according to the regression beta coefficient is equal to 0.862. The correlation (R) between implementing the transformation project and the patients' average stay is 0.862. The coefficient of determination (R^2) was 0.743. This value shows that 74.3% of the changes in the patients' average stay are about the existing order. Because this value does not consider the degree of freedom, the implementation variable of the transformation project alone explains 74% of the variance (changes) of the average patient stay variable.

The results are consistent with the research findings of Mousavi Rigi et al. (2015). The length of stay in the hospital is an important indicator that is widely used to analyze the service use and the efficiency and performance of hospital activities. Through the analysis of the index of the patient's stay in hospitals, it is possible to achieve the goal of better allocation of resources and hospital beds and optimal productivity of the existing beds. Measures are necessary to reduce the number of elderly patients in the hospital through the development of home care and nursing homes. Establishing a referral system and establishing a family doctor in the cities will also help to diagnose diseases faster, shorten the treatment period and reduce unnecessary stays in the hospital. Policymakers and managers can help patients to plan access to specialist forces at all hours of the day and night, review the necessity of some tests, visits, and diagnostic services, review the performing diagnostic services, not accepting non-emergency patients in the evening, and night and taking advantage of the capabilities of health information technology.

Therefore, the standardized coefficient (Beta) of the implementation variable of the transformation project on energy consumption is 0.783 and the significance level (Sig) of the t statistic is 0.0001. We can accept that, in the statistical population, implementing the transformation project has a positive, strong, and significant effect on energy consumption. The effect is 0.783, according to the regression beta coefficient. The correlation (R) between implementing the transformation project and energy consumption is equal to 0.783. The coefficient of determination (R^2) is 0.614 and this value shows that 61.4% of energy consumption changes are about implementing the transformation project. The results are consistent with the research of Hashemian et al. (2016), Mousavi Rigi et al. (2015), and Kasiri et al. (2014). Nearly 10% of the current budget of hospitals is spent on purchasing energy carriers. Determining the amount of consumed energy based on a hospital bed can be a criterion for calculating the cost of energy consumption in hospitals. It is very effective to calculate the actual cost of a daily bed, determine the share of energy in the budget of hospitals and identify hospitals with high consumption of energy. During three years, the average consumption of water was 2.99, electricity was 13.38 to 22.30 times more than the world standard consumption and the average consumption of gas per day bed was 19.5 cubic meters. There was a significant positive correlation between bed variables and the variables of electricity, water, and gas consumption. It seems necessary to use management systems of energy consumption in order to save energy consumption in the building. By forming an energy consumption committee and establishing a position in health centers, under the title of special energy supervisor, targeted planning toward optimization and training of energy consumption among hospital personnel and managers and promotion of creative solutions, we can optimize energy consumption and current hospital costs

Based on the results of the bivariate regression analysis test, we can accept that in the statistical population, implementing the transformation project has a positive, severe and significant effect on the reduction of out-of-pocket payments. The effect level is equal to 0.857 according to the regression beta coefficient. The correlation (R) between implementing the transformation project and the reduction of out-of-pocket payments is equal to 0.857. The coefficient of determination (R^2) was 0.735, and this value shows that 73.5% of the changes in the reduction of out-of-pocket payments are about implementing the transformation project of the existing health system. The results are consistent with the research of Rezaei et al. (2015), Mousavi Rigi et al. (2014). Equitable provision of financial resources in health systems means that the risks the household faces because of the costs of the health system are distributed according to their ability for payment, rather than the risk of the disease itself. A fair financing system ensures the financial protection of all people. The exponential increase in the costs of the health sector in the country increases the payment from the people's pockets. The first service package in the project of the health system transformation is the program of reducing the amount of payment for hospitalized patients in hospitals affiliated with the Ministry of Health, Medicine, and Medical Education. The analysis of the findings showed that the government could reduce significantly the amount of out-of-pocket payments for patients and take an effective step in achieving its goals. It seems necessary to investigate the reasons for the increase in

costs and the burden of referrals.

Based on the results of the bivariate regression analysis test, the significance level of the regression for this statistic F was equal to 0.0001, showing that the regression was significant at the 95% level. We can accept that in the statistical population, implementing the transformation project has a positive, strong, and significant effect on the attendance of doctors, and the effect level is equal to 0.844 according to the regression beta coefficient. The correlation (R) between implementing the transformation project and the attendance of doctors is equal to 0.844. The coefficient of determination (R^2) was 0.713 and this value shows that 71.3 percent of the changes in the attendance of doctors are about implementing the transformation project of the existing health system. The results are consistent with the researches of Rezaei et al. (2015) and Mousavi Rigi et al. (2015). The hardship of the work of the employees of the hospital departments is decreased from their working hours, depending on how many percent of the hardship coefficient they take. As for jobs with a 25 to 100% work hardship coefficient, their working hours decrease by half an hour to 2 hours. If a nurse works in a place that has a 100% work hardship coefficient, 2 hours should be reduced from 44 hours. One hour is reduced because of the shift in circulation. 8 hours can be subtracted from a nurse's working hours.

Conclusion

In May 2014, the project of the health system transformation began with the two major goals of increasing just access to health goods and services; it announced its guidelines to medical sciences universities across the country. With implementing this project, the quality of medical services is supposedly improved in the inpatient departments of government hospitals, besides financial protection of people against health costs. The results of the research show that the standardized coefficient (Beta) of implementing the transformation project variable on hospital productivity is 0.960, the percentage of bed occupancy and bed turnover is 0.852, the patient stay is 0.862, energy consumption is 0.783, the reduction of payment from the people's pockets is 0.857 and the attendance of doctors is 0.844. The goals of this project were followed up in four steps respectively: "Improving access, affordability, and quality of treatment", "Development of self-care", "Realization of tariffs" and "Transformation in medical education".

Considering the significance of the relationship between the transformation project of the health system and the productivity of the hospital, the goals of the organization should be explained clearly, considering all the conditions of the hospitals. The roles and responsibilities of employees should be clear and decisions should be effective. An obvious method should be defined for doing things. Employees should know the issues of their work. Officials should pay attention to problems outside hospitals and employees' work environment, and in this way increase the performance and productivity of hospital employees by motivating them.

We couldn't include all the hospitals in Yazd as part of the statistical population of the study because of the lack of necessary credit. Therefore, we suggest to the researchers expand this research with other hospitals and higher education centers, identify the roots of the problems and improve the productivity of the hospital by implementing the five S system.

REFERENCES

1. Alizadeh, Amir (2014) Strategic planning in small industries of Semnan province based on the SWOT model in early yield enterprises of Semnan province, the second accounting and management conference 31
2. Berman P, Bitran R.(2011). Health Systems Analysis for Better Health System Strengthening. The World Bank, Health, Nutrition, and Population (HNP) Discussion Paper, 1: 2-4.
3. Dadger, Reza & Jahani, Mohammad Ali & Mahmoudi, Qahraman (2016). Investigating the impact of the project of the health system reform on the performance indicators of hospital centers affiliated to Lorestan University of Medical Sciences, Scientific Research Quarterly of Lorestan University of Medical Sciences, Vol. 19, No. 2, Series 72
4. Ghazizadeh, Javed & Partovi, Yeganeh & Alidoust, Saeeda & Kawakeby, Nesa (2017). Evaluation of performance indicators in hospitals affiliated to health care networks of East Azarbaijan province (before and after the implementation of the health transformation project), Payesh magazine, year 17, No. 3
5. Hashemian, Mehri & Ferdowsi, Massoud & Moinipour, Massoud & Fattah, Hamidreza (2016). Evaluating and comparing the efficiency of hospitals in Isfahan province in the years before and after the implementation of the health transformation project (2012-2014) using the Paben-Lasso model, Journal of Ilam University of Medical Sciences, year 25, No. 3
6. Kathiri, Kianoush & Raisi, Ahmad Reza & Ahmadi, Sanaz (2013). Role of the implementation of the health transformation project in the productivity index of Faiz Hospital, the second international conference on managing challenges and solutions, Shiraz, Hamyesh Nagar Scientific Conference Center.
7. Midari, Seyyed Ahmed (2012) Investigating the causes of China's success in employment with an emphasis on rural enterprises, Research Center of the Ministry of Construction Jihad.

8. Mohammadi, Mahmoud (2012) Investigating the quality of working life and productivity of bedside nurses and their relationship with each other, Ministry of Jihad and Agriculture Research Project
9. Mousavi Rigi, Seyyed Abdul Hossein & Bahrami, Mohammad Amin & Montazer Al Faraj, Raziieh & Dehghani Tafti, Arefe & Drahaki, Mojdeh (2015). Study and comparison of some operational indicators of the hospital before and after the implementation of the treatment package of the project of the health system transformation in the selected hospitals of Bushehr University of Medical Sciences, Yazd University of Health Bimonthly Research Journal, No. 6, 2015
10. Rezaei, Shirin & Rahimi Forushani, Abbas & Arab, Muhammad & Jafari Pouyan, Ibrahim (2015). Effect of the project of the health system reform on the performance indicators of university hospitals in Hamadan province, Journal of the Faculty of Health and Health Research Institute, Vol. 14, No. 2
11. Sajadi H, Zaboli R.(2016). Assessment of the Positive Effects of Health Reform Plan Implementation from the Perspective of Hospital Directors. Health Information Management, 1: 55-60.
12. Toroski M, Golmakani E, Sodagar HR, Hosseini SH, Rajabzadeh R, Borhaninejad VR, et al.(2014). Survey bed efficiency for hospitals of North Khorasan University of Medical Sciences by using standard functional criteria of the Ministry of Health. Journal of North Khorasan University of Medical Sciences, 3: 637-644.