

## Pathology of productivity in medical and health care centers

Kazem Jafari<sup>a</sup>, Abdolnezam Jafari<sup>b</sup>, Mohammadreza Tavakoli<sup>c</sup>, Fatemeh Alinia<sup>d</sup>, Alireza Afsharnejad<sup>e</sup> and Naïere Karimian<sup>f</sup>

<sup>a</sup>Master of Public Administration, Department of Management, Shahid Sattari Air University, Tehran, Iran

<sup>b</sup>Master of Economics, Azad University, Tehran, Iran

<sup>c</sup>Master of Public Administration, Azad University, Tehran, Iran

<sup>d</sup>M.A student of Public Administration, Azad University, Chaloos, Iran

<sup>e</sup>Department of Management, Islamic Azad University, Saveh Branch, Saveh, Iran

<sup>f</sup>Department of management, PhD student of science and research branch, Islamic Azad university, Tehran, Iran

### ARTICLE INFO

#### Article history:

Received August 2, 2012

Accepted 1 October 2012

Available online

October 1 2012

#### Keywords:

Pathology

Productivity

Performance evaluation

technology

Management method

Labbafinejad Hospital

### ABSTRACT

Productivity is one of the most important factors influencing revenue management. Increasing productivity will consequently increase profitability and it is important to find major barriers for reducing productivity. In this paper, we present an empirical study to analyze productivity in a hospital called Labbafinejad in Iran. The present study is a descriptive cross-sectional study carried out in 2010. The population of this study was 110 people of Labbafinejad Hospital's staff and the proposed study chose a sample including 64 nurses, service and administrative staff, randomly. The proposed study of this paper designs and distributes a questionnaire among the selected sample size in an attempt to find the relationship between productivity and three main indices of management method, performance evaluation, and technological improvement. The results of the survey have been analyzed using Spearman correlation ratio as well as regression analysis. The results show a meaningful relationship between three main indices as independent variable and productivity. The highest correlation is between management method and productivity (0.915) and the lowest correlation is associated with performance evaluation and productivity (0.735).

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## 1. Introduction

Human endeavors always focus on the issues, which would benefit the most from the least. Nowadays, productivity is put forward beyond a criterion and is seen as a culture of vision in work and life; and its improvement will be the source of development in organizations. Productivity in organizations is considered as a determinant factor of salary and wage, price, and other production factors. For managers, proportions of productivity are used as a means of controlling in the

\* Corresponding author. Tel:+ 989124509754  
E-mail addresses: k.jafari81@gmail.com (K. Jafari)

production process and they are also used as a criterion for comparing the performance of institutions (Seyed Javadin, 2009).

Many organizations encounter significant obstacles and limitations for applying effective management for increasing productivity. There is a generally accepted agreement about the low level of productivity in organizations in many developing countries and there have been tremendous efforts to find the main causes of low productivity in organizations (Mirsepasi, 1995).

Nowadays, productivity is beyond a criterion and its improvement is considered as the main source of economic boom. Service industry is one of the main economic parts in each country. After equipping with the power of industry, mine, and farming, developed countries now understand the growing importance of services as a propulsive force for improvement and advancement. Productivity enjoys double importance for hospitals as service organizations, which engage in constant interactions with people, especially in state centers. Productivity evaluation makes it possible to assess and predict future needs of the organization correctly (Ammons, 1985).

Services quality in organizations, which present the services enjoy special importance. Hence, from the outset of 90s, theoretical and practical concepts of presenting medical and health services have undergone basic evolutions (Bruce & Jain, 1991). Although the best and the most important index for measuring quality and quantity of services is customers' satisfaction (Hudak & McKeever, 2003), satisfaction is provided through other variables in the organization. Some investigations have been done in the range of productivity and obstacles identification. In an investigation carried out in Australia, medical technology was identified as one of factors that increase occupational stress in surgery nurses (Johnstone, 1999).

Rose et al. (2004), in their study in state and private hospital in Malaysia, studied quality dimensions of hospital services from two different aspects: technical and personal. Personal aspect includes factors such as patient training and treatment expenditure. Technical aspect includes factors such as method of caring, access time, welfare facilities, and social support (Rose et al., 2004). Duggirala et al. (2008) specified seven factors for evaluating service quality including foundation, staff's performance, clinical care procedure, administrative process, safety indices, general experiences from medical care, and social responsibility. The research institute Development Dimensions International published results of a meta-analysis research showed that occupational satisfaction of staff had a strong relationship with their commitment and loyalty and both of them had meaningful impact on the productivity (Development Dimensions International, 1997).

According to a research carried out on staff productivity, there are some major factors such as occupational motivation, occupational satisfaction, management method, and possession and participation in the profit, which play important role in productivity improvement (Sisk, 1999).

According to Krueger (2005), a strong relationship was seen between occupational satisfaction and occupational motivation with productivity of labor force. Gillup institute (quoted by Krueger, 2005) reported in another study that high occupational satisfaction and occupational motivation could lead to an increase of 50% in productivity in labor force, an increase of 50% in tendency of staff to remain on the work place and not to leave the work place, and an increase of 33% in productivity in the USA (Krueger, 2005). Providing optimum medical services and improvement of clinical processes without involving all of the human resources and presenting constant, desirable, and effective services by them is impossible. Presenting effective medical and health services to the society depends mostly on the group work of medical and health staff and the method of handling and managing such organizations (Mosadegh Rad, 2005, 4).

Mosadegh Rad (2003) considered the relationship between leadership style of managers and efficiency of hospital universities in Isfahan. The results of the research showed that most of the hospital universities in Isfahan had participative management. Since this research was conducted in

hospital based universities in Isfahan, the results cannot be generalized for other hospitals. On the other hand, considering the fact that all of the hospitals have used participative management, specifying the relationship between the leadership style of managers and efficiency of hospitals has not been provided (Mosadegh Rad, 2005).

Ebadi (2005) studied and identified the most important factors and strategies in increasing productivity in Saba engineering institute. In this research by means of questionnaire he identified the most important factors influenced on increasing the productivity and also he studied effective strategies in increasing the productivity via AHP method.

In 1996, Seryery achieved good results by means of survey method and with the sample volume of 536 persons in the west of Australia in a research named as “improvement of productivity”. Unlike the public perception that people suppose managers play an important role in increasing the productivity, the combination of three factors namely, staff, managers, and customers results in productivity (Seryery, 1996).

Sajjadi et al. (2011) investigated the impact of productivity committees being established in various hospitals of the Isfahan University of Medical Sciences in 2008. They discussed that having special committee for productivity improvement and attempted to establish such committee. Chang et al. (2011) investigated the impact of Taiwan quality indicator project participation on hospital productivity improvement by applying Malmquist productivity change index using the art of data envelopment analysis. Duszak Jr and Muroff (2010) measured the productivity in radiology segment of different hospitals and discussed that measuring the efficiency and productivity of these units could help for better job promotion.

In this paper, we discuss the impact of three factors including management methods, technology improvement and performance evaluation on productivity using some statistical tests. The proposed study of this paper first demonstrates the proposed work in section 2, results of the survey are given in section 3 and finally, concluding remarks are given in the last to summarize the findings of the paper.

## **2. The proposed model**

This research constitutes the effect of three independent variables namely, the management method, technology improvement, and staff performance evaluation and their relationships with productivity, which have been evaluated by statistical tests. So hypotheses of the research are stated as:

1. There is a relationship between management methods and productivity.
2. There is a relationship between technology improvement and productivity.
3. There is a relationship between performance evaluation system and productivity.

The methodology of this research is descriptive and of correlation one since it has been carried out in real conditions. In the case of gathering data, it has used survey method because it has been carried out via surveying of Labbafinejad Hospital staff and in the case of its aim, it is an applied research. It is a correlation one because it deals with the relationship between three factors of management method, technology improvement, and staff performance evaluation with the amount of productivity improvement. If there are some relationships among variables, their impacts will be evaluated by statistical methods and analyses.

The research population consists of 110 people, and statistical sample includes 64 nurses, service and administrative staff of Labbafinejad Hospital chosen via simple random technique. Since variables in this research are of qualitative type, for conducting statistical tests non-parametric statistical methods have been used. For review research, calculation method of questions' mean of related hypotheses has been used and finally correlation was calculated by means of Spearman Correlation and

Regression Coefficient. Since in Regression Coefficient, the effects of dependent and independent variables are not distinguishable, regression analysis was used.

Employed formula for Spearman Correlation Coefficient is:

$$r_s = 1 - \frac{6(\sum d_i^2)}{m(n^2 - 1)}$$

For determining validity, the research's questionnaire was designed with help of expert teachers' opinions and other opinions and suggestions. For determining reliability, after gathering data from initial sample, Cronbach's alpha coefficient was calculated as 0.9425 for research's questionnaires. Therefore, it can be claimed that questionnaire enjoys acceptable reliability.

### 3. Research Findings

The results of research hypotheses are presented in Table 1.

**Table 1**

The results of testing hypotheses based on spearman correlation test

Hypotheses	Spearman Coefficient	Correlation	p-value	Standard level	Meaningfulness	Test's result
1		0.915	0.000		( $\alpha= 0.05$ )	H <sub>0</sub> rejection
2		0.837	0.000		( $\alpha= 0.05$ )	H <sub>0</sub> rejection
3		0.735	0.000		( $\alpha= 0.05$ )	H <sub>0</sub> rejection

As observed in Table 1, management method's correlation coefficient is more than technology improvement and performance evaluation's ones; this indicates that the change of management method in any case affects productivity and in comparison to performance evaluation, technology improvement has more effect on the productivity. Ranking independent variables in Table 2 are management method, technology, and performance evaluation respectively. However, as mentioned before performance evaluation has direct and linear relationship with productivity and we should bear in mind that by putting evaluation aside, weak and strength points are not specified and competition between staff will disappear.

**Table 2**

Ranking independent variables

Independent Variables	Dependent Variable	Spearman Correlation Coefficient	Mean	Linear Regression
Management method	Productivity	0.915	31.32	$y = 22.648 + 1.604x$
Technology	Productivity	0.837	25.29	$y = 15.797 + 2.373x$
Performance evaluation	Productivity	0.735	17.71	$y = 15.749 + 3.257x$

According to the research findings, with technology improvement in this hospital, productivity improves. Providing high technological devices is associated with medical and health services (like MRI system, CT scan system etc) entails high expenditures, and great amount of attention should be paid in providing such devices. Considering the total lack of production of such machineries in the country and limitations on their imports, it is necessary to contract with valid companies in order to use their after sale services effectively.

There is no precise assessment about equipment's arrangement in work places commensurate with physical characteristics of human (Ergonomics) in Labbafinejad Hospital. This issue may cause

staff's alienation and, moreover, it may cause atrophy and psychological effects. By means of ergonomics engineering, we can obviate this defect. As this organization uses expert psychologists and industrial management, the problem will solve easily and with low expenditure.

The aim of performance evaluation is evaluation, valuation, and judgment about headquartered and administrative districts according to related regulations and laws of the moral and economic approach in criteria of efficacy and efficiency in order to improve the quality of state services. In the case of third hypothesis, we can claim that aims such as performance improvement, providing feedback to staff, growth and guidance, promote staff and dedicate raise to them are achieved via performance evaluation. We can also justify educational needs and staff's weak points can be generalized in medical and health organizations. If we can achieve this aim and pursue required contrivances for improvements and obviating defects and also obviating staff's weak points, a large amount of organizations' problems will obviate.

Little delegation of work, which is of salient features of participative management, has been applied in Labbafinejad Hospital. Delegating of work can result in the following; first, we can reduce the amount of labor and second prepare staff for future occupational route.

#### 4. Conclusion

As it is observed in Table 2, among all of the above mentioned factors, there is a relationship between productivity as dependent variable and other independent variables. The type of relationship in all cases is direct and related to the intensity of variable. Any change certainly affects Labbafinejad Hospital's efficiency or inefficiency including increase or decrease of productivity. With regard to such an important point mentioned in this research, the role of organization's manager is productivity improvement, which according to the research findings has the most amount of correlation with productivity factor.

#### Acknowledgement

The authors would like to thank the officials of Labbafinejad hospital for their support on gathering the necessary information needed for accomplishment of this survey.

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