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Efficacy of Organizational Intelligence on Hospitals' Performance Indicators

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Abstract: This study is from the few studies that examined the relationship between hospitals' organizational intelligence and their performance. In this descriptive-analyzed and applied study for the organizational intelligence measurement, Albrecht model was used because it was able to measure organizational intelligence and for the performance measurement, performance indicators declared by Ministry of Health was used. Data analyzing showed that there was a significant positive relationship between hospitals' organizational intelligence and performance indicators of "Ratio of active beds to fixed beds", "Ratio of patients' admission per active bed", "Bed turnover ratio", "Bed turnover interval", "Average length of patient's stay", "days' occupied bed", "percent of total admitted patients" ($P<0.05$) but there was not a significant positive relationship between hospitals' organizational intelligence and performance indicators of "Bed occupancy ratio", "Ratio of surgeries to operation beds" ($P>0.05$) organizational intelligence had the highest correlation with indicators of Bed Turnover Interval ($r = 0.739$) and the average length of patient stay (0.691). Each unit increase in organizational intelligence increases the hospital performance as 0.81%. Therefore, since performance indicators are important in improving of organization productivity, focus on the topic of organizational intelligence is necessary.

Key words: Organizational Intelligence · Bed occupancy ration · Average length of patient stay · Bed Turnover Interval · Bed Turnover ratio · Days occupied bed

INTRODUCTION

Among the centers that are the focus and development priorities of the medical health section are hospitals [1]. Hospitals as the most important element of the health system play a key role in providing medical health services and have a great impact on the efficiency of health system [2]. In fact, the hospital services as the most expensive component of the health system has suffered serious problems [3]. According to World Bank studies, in developing countries, hospitals have allocated approximately 50 to 80% of total cost of the health section [4]; because they are the largest and most costly operational units of health system which use the main part of the capital financial and human resources [5]. Under this circumstance, it's not surprising that hospitals, as a major costs consumer in the health system, are in the public attention [6]. Therefore, improving productivity of hospital cares and reducing costs by the best using of available capacities must be on the focus of the hospital administrators and officials [7]. In this regard, each hospital requires to efficient management and constant supervision on patient care through information management system. This system contains inputs which lead to improved decision making. From the most important input data of this information management system, performance indicators can be noted that hospital managers use them to evaluate the efficiency status of the hospitals [8]. In fact, statistics and indicators of an organization is one of the criteria for measuring of organization performance success and determining of the rate of achieving to the desired goals [9]. Indicators are the most important factor showing hospital performance that should be examined regularly in determined time

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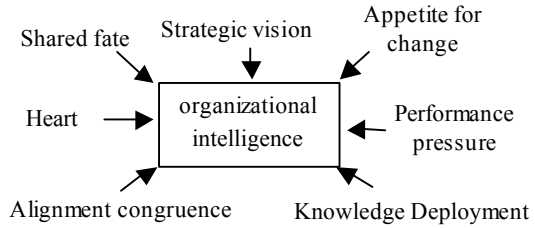
periods [10]. As stated before, the indicators are the tools for internal and external evaluation of hospital performance and should be designed in a way to measure the rate of achieving to the predetermined goals [11]. Since, hospital indicators are from the most important tools to measure efficiency and productivity of hospital services, if properly collected and analyzed, play an important role in decision-making and improving the quality and can be suitable basis for judging about the performance of the hospital [12]. Therefore, to increase the productivity and efficiency of hospital services, factors affecting on the hospital indicators can be examined and since the organizational intelligence is suggested as a necessity for achieving more efficiency in organizations [13], we evaluate the organizational intelligence as one of the factors affecting on hospitals' performance indicators. Organizational intelligence means the capacity and ability of the organization to mobilize all available brain forces and focusing of these brain power to achieve the organization's mission and goals. Many studies have been performed on organizational intelligence, but today, most prominent model of organizational intelligence, is Albrecht organizational intelligence model [14].



Form1: Albrecht organizational intelligence model [15]

According to this model, organizational intelligence can be increased through improved dimensions of organizational intelligence that lead to the faster and more accurate analysis of the information of organization environment and obtained results are usefully saved and will be available for the decision makers in appropriate cases [16].

Since, today, one of the biggest challenges of management is how we can create the intelligent organizations in order to change rapidly according to their environment changes and can ensure the success and survival of the organization in outside turbulent and chaotic environment [17] with emergence of new technologies and the need to dominate and take advantage of new technologies, the management was required to focus special attention on organizational intelligence [18]. Thus, assessment of organizational intelligence is essential for organizations especially for the hospitals; according to the results of this assessment, we can identify strengths and weaknesses and also we can improve the performance regarding to the determined relationship between organizational intelligence and the hospital performance.

General Objective of the Study: Determining the relationship between organizational intelligence and the selected hospitals.

Specific Objectives of the Study:

- Determining the relationship between organizational intelligence and the ratio of fixed beds to active beds of the selected hospitals.
- Determining the relationship between organizational intelligence and the ratio of patient admission per active bed of the selected hospitals.
- Determining the relationship between organizational intelligence and Bed Turnover ratio of the selected hospitals.
- Determining the relationship between organizational intelligence and Bed Turnover Interval of the selected hospitals.
- Determining the relationship between organizational intelligence and the average length of patients stay of the selected hospitals.
- Determining the relationship between organizational intelligence and ratio of bed occupancy of the selected hospitals.
- Determining the relationship between organizational intelligence and days occupied beds of the selected hospitals.
- Determining the relationship between organizational intelligence and percentage of total admitted patients of the selected hospitals.
- Determining the relationship between organizational intelligence and percentage of surgeries to operation beds of the selected hospitals.

The Study Hypotheses:

- There is a significant relationship between organizational intelligence and the ratio of active bed to fixed bed of the selected hospitals.

- There is a significant relationship between organizational intelligence and the ratio of patient admission per active bed of the selected hospitals.
- There is a significant relationship between organizational intelligence and bed turnover ratio of the selected hospitals.
- There is a significant relationship between organizational intelligence and bed turnover interval of the selected hospitals.
- There is a significant relationship between organizational intelligence and average length of patient stay of the selected hospitals.
- There is a significant relationship between organizational intelligence and ratio off bed occupancy of the selected hospitals.
- There is a significant relationship between organizational intelligence and days occupied beds of the selected hospitals.
- There is a significant relationship between organizational intelligence and percentage of total admitted patients of the selected hospitals.
- There is a significant relationship between organizational intelligence and ratio of surgeries to operation bed of the selected hospitals.

MATERIALS AND METHODS

In this cross-sectional, descriptive study, 388 employees of 12 hospitals related to Mashhad University of Medical Sciences were selected through classified and simple randomization. Data collection included Albrecht Organizational Intelligence questionnaire which has high ability to measure organizational intelligence and has been checklist of hospital performance. Organizational Intelligence questionnaire consisted of 51 questions that two perverted questions of 15 and 37 were considered as lie detector in the questionnaire and was classified with 5-scores Likert scale from completely agree (5) to completely disagree (1).

This questionnaire was approved by the related professors before using and its validity was confirmed; with regard to the suitability of the alpha coefficients (0.93), internal validity was confirmed. The hospital performance questionnaire consisted of the indicators declared by the Ministry of Health [11]. Of course, the indicator related to death was removed due to privacy and lack of availability to it. Reliability and validity of the questionnaire was approved by the Arab. To maintain the privacy of the information, names of the hospitals were marked with numbers 1-12.

Performance Indicators Are:

- The ratio of active bed to fixed bed
- The ration of admission of each patient per active bed
- The bed turnover ratio
- Bed turnover interval
- Average length of patients' stay
- Bed occupancy ratio
- Days occupied bed
- Percentage of total admitted patients
- Percentage of the surgical operation to surgery bed

Finally, data was collected as fielding and were analyzed using descriptive statistics and Pearson correlation test and Kolmogrov-Smirnov test and SPSS / pc ++ software. $P \leq 0.05$ was considered statistically significant.

RESULTS

In this section, the demographic results are explained. As shown in Table 1, 67% were female, and the other was male. Most of them were in the age group of 30-40 years (42.3%) and lowest age group was belonged to above 50 years (2.3%). Most of the studied patients had bachelor degree (83%) and only 4.6% of them had a master degree or higher. In terms of history of working, the majority of participants were in group of less than 5 years (35.1%) and in the terms of type of employment, they were in the group of contract employment (40.5%).

Here, we discuss about the main results of the study. As it is outlined in Table 2, there is a significant relationship between organizational intelligence and hospital performance indicators. (P-Valu<0.05)

As it is observed in Table 3, organizational intelligence is significantly associated with all hospital performance indicators except the indicators of ration of bed occupancy and ratio of surgeries to operation bed ($P<0.05$). Among the performance indicators that are significantly associated with organizational intelligence, most correlation was related to bed turnover interval and less correlation was related to bed turnover ratio.

According to Table 4, the mean score of organizational intelligence in the studied hospitals was between 2.61 to 4.01. The highest score of organizational Intelligence was related to hospital No. 8 with score of 4.01and the lowest score was related to hospital No. 6 with score of 2.61. Totally, organizational Intelligence mean score of the studied hospitals was 3.48.

Table 1: characteristics demographic of the studied patients

Demographic characteristics		Frequency	(%)
Gender	Male	128	33
	Female	260	67
Age	<30 yrs	131	33.8
	30-40 yrs	164	42.3
	40-50 yrs	84	21.6
	>50 yrs	9	2.3
Education	>diploma	48	12.4
	Bachelor	322	83
	Master of science and PhD	18	4.6
History of working	<5 yrs	136	35.1
	6-10 yrs	97	25
	11-15 yrs	70	18
	16-20 yrs	33	8.5
	>20 yrs	52	13.4
Type of employment	Official	112	28.9
	Contract	157	40.5
	Project	119	30.6

Table 2: The relationship between organizational intelligence and hospital performance indicators

	Organizational intelligence	
	r	P-value
Performance of the selected hospitals	0.813	0.001

Table 3: Relationship between organizational intelligence and performance indicators of selected hospitals

	Organizational intelligence	
Performance indicators	r	P-value
Ratio of active beds to fixed beds	0.661	0.019
Ratio of patients' admission per active bed	0.653	0.021
Bed turnover ratio	0.611	0.035
Bed turnover interval	0.739	0.006
Average length of patient's stay	0.691	0.013
Bed occupancy ratio	0.454	0.138
days' occupied bed	0.66	0.019
percentage of total admitted patients	0.683	0.014
Ratio of surgeries to operation beds	0.444	0.148

Table 4: Organizational Intelligence score of the hospitals

Hospital code	Mean	SD
1	3.5	0.489
2	3.21	0.661
3	3.39	0.631
4	3.85	0.448
5	3.87	0.471
6	2.61	0.517
7	3.48	0.729
8	4.01	0.434
9	2.98	0.149
10	3.52	0.193
11	3.48	0.249
12	3.89	0.391

DISCUSSION

According to Albrecht categories, if the intelligence score was closer to 4.8, the hospital organizational intelligence is more favorable. According to the findings of this study, 33% of the studied hospitals (hospitals of No. 4, 5, 8,12) were in good condition in terms of organizational intelligence; 58% of hospitals (hospitals of No. 1, 2, 3, 7, 9, 10, 11) were in acceptable condition and only 8% of hospitals (Hospital No. 6) was in poor condition. According to total score of hospital organizational intelligence and based on Albrecht classification, all the hospitals are in acceptable condition in terms of organizational intelligence. Since the correlation of organizational intelligence and hospital performance was obtained as 0.81%, so each one unit increase in organizational intelligence can increase performance indicators as 0.81%.

Based on the research findings, hypothesis 1 was accepted which stated that there is a significant relationship between organizational intelligence and the ratio of active beds to fixed beds of the selected hospitals ($P<0.05$). As a result, one unit increase in organizational intelligence increases the condition of the ratio of active beds to fixed beds as 0.66%; it means that if the organizational intelligence agency of hospitals be increased, the number of active beds will increase as 0.66% rather than fixed beds and so performance, productivity and efficiency of the hospital will improve.

Hypothesis 2 was accepted which stated that there is a significant relationship between organizational intelligence and the ratio patients' admission per active bed of the selected hospitals ($P<0.05$). As a result, each one unit improvement in organizational intelligence will increase the ratio patients' admission per active bed as 0.65%. Since organizational intelligence is associated with organizational different aspects and human resources, thus improving in these aspects including improving in the quality of work life, employees' motivation and so on leads to improved performance and more efficiency.

Hypothesis 3 was accepted which stated that there is a significant relationship between organizational intelligence and bed turnover ratio of the selected hospitals ($P<0.05$). In fact, each one unit improvement in organizational intelligence increases bed turnover ratio as 0.61%.

Based on the research findings, hypothesis 4 was accepted which stated that there is a significant relationship between organizational intelligence and bed turnover interval of the selected hospitals ($P<0.05$).

Each one unit improvement in organizational intelligence decreases turnover interval as 0.74% and thus hospital performance will increase; this indicator had the highest correlation with organizational intelligence.

Based on the research findings, hypothesis 5 was accepted which stated that there is a significant relationship between organizational intelligence and the average length of patient's stay of the selected hospitals ($P<0.05$). Each one unit improvement in organizational intelligence decreases the average length of patient's stay as 0.69%, and thus hospital performance will increase. Based on the aspects of organizational intelligence and positive relationship of organizational intelligence with the performance, if the staff and management had more commitment, satisfaction and knowledge of their organization and have more organizational intelligence, they will work with more interest and thus the average length of patient's stay will decrease and the patient no longer will have to pay an extra cost without any cause.

Hypothesis 6 was not accepted which stated that there is a significant relationship between organizational intelligence and the ratio of bed occupancy of the selected hospitals ($P>0.05$). Whatever organizational intelligence was high cannot increase the ratio of bed occupancy because this indicator can be related to other factors. Based on field interviews with officials, administrators, staff and related masters, some of these factors can be region population, different expertise, availability of medical facilities and services, the availability and quality of services.

Hypothesis 7 was accepted which stated that there is a significant relationship between organizational intelligence and days occupied beds of the selected hospitals ($P<0.05$). In fact, each one unit improvement in organizational intelligence will increase day's occupied beds as 0.66%.

Hypothesis 8 was accepted which stated that there is a significant relationship between organizational intelligence and percentage of total admitted patients of the selected hospitals ($P<0.05$). In fact, each one unit improvement in organizational intelligence will increase total admitted patients as 0.66%.

Hypothesis 9 was not accepted which stated that there is a significant relationship between organizational intelligence and ratio of surgeries to operation bed of the selected hospitals ($P>0.05$).

Finally, it was determined that the indicator of "bed turnover interval" had the highest correlation and the indicator of "bed turnover ratio" had the lowest correlation with organizational intelligence. Other indicators from highest to lowest correlation with organizational intelligence were "average length of patient's stay, percentage of total admitted patients, ratio of active beds to fixed beds, patients' admission per active bed, of admitted per cent, bed turnover ratio, and day's occupied bed", respectively. However, there are many confounding factors such as geographic location of the hospital, policies governing on the hospital, lack of hospital beds and facilities, the income of each hospital and so on which could affect on the indicators.

CONCLUSION

Main part of organizational policy formulation and performance is measurement of the performance [19]. Today, organizational performance has become a national priority in the economy of all countries [20]. In conclusion, according to the research findings based on that each one unit increase in organizational intelligence leads to increased hospital performance as 0.81%,and whatever organizational intelligence was higher, bed turnover interval, the average length of patient's stay will be shorter and the ratio of patient admissions per active bed, ratio of active beds to fixed beds, day's occupied beds, and percentage of total admitted patients will increase and it is satisfying for both the patient and the hospital from various aspects including cost. Therefore, to improve the performance and the productivity of any organization, we can increase organizational intelligence.

Thus, to increase organizational Intelligence below solutions are offered:

- Ith regard to the organizational intelligence and performance indicators " Bed occupancy ratio " and " Percentage of the surgical operation to surgery bed" were not correlated, Influencing variables on these indicators should be identified and for change and improvement the two indices, it should be used of variables other than the enterprise intelligence.
- Based on the results of the research, intelligence organizational had the highest correlation with performance indicator of "bed turnover interval" Therefore, managers can improve this indicator by focus on the hospital organizational intelligence.

- Performance indicators of " average length of patient's stay"," percentage of total admitted patients", " ratio of active beds to fixed beds", " day's occupied bed", " Ratio of patients' admission per active bed" and " bed turnover ratio" respectively after indicator of " bed turnover interval " had the highest correlated with the variable of organizational intelligence. Therefore, hospital managers can change the indicators mentioned proportional with increasing and improving organizational intelligence.
- Hospital managers can increase organizational intelligence by solutions provided, and thus it, performance indicators and finally quality of service provided and organization productivity improve. The addition of organizational intelligence variable, other variables can be used for improve the performance indices simultaneously.

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