

# Impact of the Presence of Resident Specialists on the Emergency Department Performance Index at Hospitals of Mashhad University of Medical Sciences, Mashhad, Iran

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## ABSTRACT

**Aim:** The main purpose of an emergency department (ED) is providing high quality services in the shortest possible time. Presence of resident specialists is one of the elements in healthcare reform plan which has been implemented with the aim of resolving the main problems of the healthcare system. This study examines the impact of the presence of resident specialists on the emergency department performance index (EDPI) at hospitals of Mashhad University of Medical Sciences (MUMS).

**Materials and methods:** In this cross-sectional study, changes in EDPI were investigated over a period of June 2013 to June 2014 (before the presence of resident specialists) and June 2014 to June 2015 (after the presence of resident specialists). All hospitals in MUMS which implemented the presence of resident specialists were selected by the census method. Hospital General Information Form was used to collect data. Information required were collected and recorded after obtaining the permission from the health department. After collection, data were analyzed by SPSS 19.

**Results:** The percentage of disposed patients within 6 hours before the presence of resident specialists was 80.96% and after the presence of resident specialists was 89.07%. The percentage of leaving the ED in 12 hours before the presence of resident specialists was 86.21% and after the presence of resident specialists was 88.76%.

**Conclusion:** According to the results, it can be concluded that the EDPI in hospitals of MUMS after the presence of resident specialists has shown a significant difference, and improved, except for those left ED in 12 hours.

**Keywords:** Department performance index, Emergency department, Hospital, Resident specialists.

*International Journal of Research Foundation of Hospital and Healthcare Administration* (2019): 10.5005/jp-journals-10035-1099

## INTRODUCTION

Hospital is on top of the healthcare system.<sup>1</sup> Emergency department is considered as one of the most important hospital wards that has a great impact on the performance of other wards and patient satisfaction.<sup>2</sup> Emergency department is the center of hospital and due to the need for rapid, high quality, effective, multiple, and complex processes, emergency position in the hospital and healthcare system should be very exceptional and sensitive. Emergency department is of utmost importance because of receiving the most overcrowding, diverse, troublesome, and most sensitive group of patients.<sup>3-5</sup> On average, 50% of hospital beds are occupied by EDs, in which an approximately 25/7 percent of active beds accounted for them and damages that arise out of it are more than 500 million dollars worldwide.<sup>6,7</sup> Each year, this department receives nearly thirty million critically ill patients and outpatients throughout the country and provides them with immediate healthcare.<sup>8</sup> Ensuring optimal performance of emergency services and the realization of improvement in every aspect of quality entail measurement and continuous monitoring. Emergency measures are one of the tools for measuring the performance of emergency. The first issue of the quality of services and patient rights is patient's waiting time to receive services.<sup>9,10</sup> Indeed, the main purpose of an emergency is providing high-quality services in the shortest possible time. Long-term stop in emergency decreases providing services to other patients in need of medical emergencies and leads to patient dissatisfaction as well as additional losses due to disasters.<sup>5</sup> In contrast, lives of patients could be saved from certain death and disability with proper and timely care.<sup>11</sup> In May 2013,

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**How to cite this article:** Bakhshi R, Mahfoozpour S, Alimohammadzadeh K, *et al.* Impact of the Presence of Resident Specialists on the Emergency Department Performance Index at Hospitals of Mashhad University of Medical Sciences, Mashhad, Iran. *Int J Res Foundation Hosp Healthc Adm* 2019;7(1):29-32.

**Source of support:** North Tehran Branch of Islamic Azad University of Tehran, Iran has supported this study

**Conflict of interest:** None

given the emphasis of policymakers and healthcare planners with three approaches of financial protection from people, creating equity in access to health services, and promoted quality of services, healthcare reform plan has been implemented in the country.<sup>1,12</sup> One of the healthcare reform plan packages is the presence of resident specialists in university hospitals for 24 hours.<sup>8,13,14</sup>

The overall goal is to provide timely benefit to the public health services through the constant presence of resident specialists in hospitals affiliated to Ministry of Health and Medical Education.<sup>12,15</sup> The implementation of this service package in line with the healthcare reform plan increases patient satisfaction and staff according to the availability of specialist physician as well as timely visits and consultations of patient and disposition of patients provides 24-hours responsiveness for health centers.<sup>12</sup>

All university hospitals affiliated with the Ministry of Health are under the program. In order to increase accountability, 24-hours medical centers/teaching hospitals and ensuring appropriate treatment services at any time of the day or night and in all parts of the country and improving the quality of healthcare services, medical universities are required in hospitals/hospital subsidiary, use of the specialists or pediatrician/fellowship as a resident specialist. Resident specialist is said to be specialist/specialty/fellowship who from 2 pm until 8 am the next day in the working days and 24 hours on holidays in the hospitals/hospital subset universities of medical sciences and in the health center has the active physical presence. Resident specialists will do disease diagnosis and treatment to their patients.<sup>12</sup>

Monitoring the performance index follow-up in the ED will significantly help to evaluate the performance of the sector. Since more than 25 percent of patients admitted to the ED will be admitted in the hospital, the quality of services in this sector is thus representative of the general service status in the hospital.<sup>8</sup> Therefore, based on the aforementioned notes in the hospital, determination of index in different sectors representing the solution of the problems considerably contributes to policy-making and it is an important factor for the monitoring and control system.<sup>16</sup> It is obvious that the presence of resident specialists in the healthcare system might be considered successful if the program can improve public health and promote health system performance in the country. Therefore, in order to evaluate the performance of program, key index in the hospitals should be investigated. Given the importance of this issue, and considering to the limited number of studies in recent years in this field, we decided to evaluate and compare EDPI in the hospitals of MUMS before and after the presence of resident specialists. It is hoped that the results of this study might provide a good strategy for improving the public access to health services, improved service delivery, increased satisfaction of among patients, service providers, and policy makers in the country.

## MATERIALS AND METHODS

This was a descriptive and cross-sectional study. As the findings and results of this research can be used by authorities of studied hospitals and generally, healthcare policy makers, it is thus an applied research as well.

### Study Population

In the present study, the population consisted of hospitals in MUMS, in which resident specialist's presence is 24 hours. Hospitals included:

- Ommolbanin Hospital (the hospital is the gynecology),
- Dr Shariati Hospital (the hospital is the heart-general),
- Shahid Hashemi Nejad Hospital (the hospital is general-accidents),
- Imam Reza Educational, Research and Treatment Center (the center is the heart-general),
- Dr Sheykh Educational, Research and Treatment Center (which specializes in Pediatrics)
- Taleghani Educational, Research and Treatment Center (which is Accidents and Trauma Center),
- Kamyab Educational, Research and Treatment Center (which is Accidents and Trauma center)
- Ghaem Educational, Research and Treatment Center (the center is the heart-general).

### Statistical Population

The statistical population consisted of information resources related to the EDPI settings of hospitals of MUMS. According to the first phase of the health reform plan, changes in EDPI were considered over a period of June 2013–June 2014 (before the presence of resident specialists) and June 2014–June 2015 (after the presence of resident specialists). The inclusion criteria were affiliation to MUMS and the presence of resident specialists in hospitals, and the exclusion criteria were a lack of access to key index data for the studied courses.

### Sampling and Sample Size

All the hospitals affiliated to MUMS were selected by the census method. To conduct the research, information resources related to EDPI in hospitals of MUMS, during the years 2013 and 2014, were studied.

### Data Collection Tools

The tools used in this study included General Hospital Information Form containing components of names of hospital, EDPI, and some resident specialist's profiles. Because the actual data, health department in designed tools, were used in the study, there is no need to determine the validity and reliability. The index included: the percentage of patients were disposed during 6 hours, left ED in 12 hours, had unsuccessful cardiopulmonary resuscitation (CPR), and discharged against medical advice. Regarding the resident specialists profiles, we had access to the items by specialty type and the number of permitted residencies.

### Data Collection

In the present study, data were initially collected by library and then survey. A review of literature and other parts of research were carried out by referring to the library books, different articles, and Internet. Then, in the field survey, information required were collected and recorded after obtaining the permission from the health department. Ethical permission was obtained from the legal health department obtained.

### Data Analysis Tools and Methods

In the current study, collected data were analyzed by SPSS 19 software. After measuring data normality, Kolmogorov–Smirnov test results showed that all of the variables were normally distributed ( $p > 0.05$ ) in which the parametric test was used to analyze *T* test. Descriptive statistics was also used to describe data and to answer research questions. A significance level of  $p < 0.05$  was considered.

**Table 1:** Emergency department performance index before and after the presence of resident specialists in hospitals of Mashhad University of Medical Sciences\* (MUMS)

Index	Groups	Number	Mean	standard error	SD	Mean
Disposed patients within 6 hours (%)	Before	96	276		27.7	80.96
	After	96	140		13.76	89.07
Left the ED in 12 hours (%)	Before	96	2.22		21.79	86.21
	After	96	1.71		16.77	88.76
Unsuccessful CPR (%)	Before	96	3.11		30.54	67.5
	After	96	2.88		28.28	56.21
Discharged against medical advice (%)	Before	96	0.81		7.97	11.68
	After	96	0.61		6.02	9.06

\*standard deviation

**Table 2:** t test for comparing the average the emergency department performance index before and after the presence of resident specialists in hospitals of Mashhad University of Medical Sciences

Index	Sig.	Degree free	t	95% confidence level		Standard error of difference	Average difference
				Upper bound	Lower bound		
Disposed patients within 6 hours	0.000	95	-4.01	-4.10	-12.12	2.01	19.79
Left the ED in 12 hours	0.072	95	-1.82	0.22	-5.32	1.39	13.70
Unsuccessful CPR	0.000	95	4.56	15.55	6.12	2.37	23.27
Discharged against medical advice	0.000	95	4.25	3.84	1.39	0.61	6.03

## RESULTS

According to Tables 1 and 2, the percentage of disposed patients within 6 hours before the presence of resident specialists was 80.96% and after the presence of resident specialists was 89.07%. The percentage of those left the ED in 12 hours before the presence of resident specialist's was 86.21% and after the presence of resident specialists was 88.76%. The percentage of unsuccessful CPR before the presence of resident specialists was 67.5% and after the presence of resident specialists was 56.21%. The percentage of discharged against medical advice before the presence of resident specialists was 11.68% and after the presence of resident specialists was 9.06%.

## DISCUSSION

The results of this study showed that the percentage of disposed patients within 6 hours has increased after the presence of resident specialists than before it, so that before the implementation, 80.96% of emergency patients were disposed within 6 hours. However, it has been increased to 89.07% after the presence of resident specialists. The main reason for the increase disposition of patients less than 6 hours was the presence of resident specialists on the patients and their timely disposition. In the studies by Asadi and Yousefzadeh, these findings were also confirmed. The results of research conducted by Horwitz showed that 79 percent of EDs discharged at least 90 percent of their patients within 6 hours.<sup>6,11,17</sup> In a study by Jayaprakash, patients were disposed as short a time as possible by employing experienced physicians and specialists in the ED.<sup>18</sup> In the study conducted by Movahednia, timing indicators of emergency in Firoozgar hospital in the first 6 months of 2011 were at the standard level. It was due to the presence of emergency resident physician and patient's disposition committee in the hospital that is consistent with the results of the present study.<sup>19</sup> Javadzadeh has recommended the use of emergency residents as a strategy to overcome emergency

congestion.<sup>20</sup> The percentage of discharged against medical advice was 11.68% and 9.06% before and after the presence of resident specialists, which is inconsistent with the results by Asadi et al. It was reported 31.4% in the study by Asadi et al.<sup>11</sup> Before the presence of resident specialists, unsuccessful CPR index was 67.05% and 56.21% after the presence of resident specialists, which seems that its reduction was due to the timely presence of resident specialists. In the study by Montazar, 74.6% of the CPR was identified unsuccessful.<sup>21</sup> Index left the ED in 12 hours prior to the presence of resident specialists was 86.21% and was increased to 88.76% after the presence of resident specialists. However, the ascending trend did not show any significant difference. The results of this study are inconsistent with the results of Baratloo and Yousefzadeh.<sup>5,8</sup> In the study carried out by Baratloo, the rate of those left the ED in the 12-hours index prior to attending emergency medicine specialists was reported 97.3% and after the change was 90.4%, respectively. His research findings indicated that the establishment of emergency medicine specialists in the ED can contribute to efficient triage. But given the changes made after the establishment of this section, other index, including the percent of disposed patients within 6 hours, left the ED in 12 hours, failed cardiac pulmonary resuscitation, and discharged against medical advice, showed no significant improvement.

It seems that in the current study, the slight growth for those left the ED in the 12-hours index is due to the shortage of beds for the in-patients, an increase in occupancy rate of hospital beds (after the presence of resident specialists) and congestion in clinical departments, timely disposition of patients, the high number of referring patients, and a significant number of unnecessary and nonclinical emergency requests lead to significant number of patients and the patients who need special care to remain a long time in the ED, and as a result, the duration of the patients in the ED is increased. It seems that to give priority to emergency patients admitted, accurate and sufficient oversight, development of beds, staffing and experienced physicians in the ED, accurate

documentation of standard forms for ED performance, and the establishment of emergency medicine in the hospitals are useful and effective for better promotion and improvement of the EDPI at hospitals.

According to the importance of index in decision-making, it is suggested that some measures should be taken at management and hospital levels to develop emergency beds for more accessibility. Meanwhile, the principle and scientific implementation of the presence of resident specialists, continuous benefit from emergency medicine services, and clarification of the duties of resident specialists in training centers, comparing the results disposed patients by emergency physicians, paying more attention to the committee to dispose, and extraction of long stay leads to improved conditions.

The limitations of the study can be noted of limited resources such as books, articles, official reports, credible and relevant to the presence of resident specialists, as well as the limitations on the effects of certain plan, the presence of resident specialists, and limitations to remove other factors.

## CONCLUSION

According to the results, it can be concluded that the EDPI in hospitals of MUMS after the presence of resident specialists have shown a significant difference, and improved, except for those left ED in 12 hours. Although the trend was improving, the difference was not significant.

In fact, the main purpose of an ED is providing high-quality services in the shortest time possible. Long-term emergency stop reduces offering services to other patients in need of emergency and this leads to patient dissatisfaction. Early diagnosis and treatment can reduce waiting time and duration of hospitalization, and by timely disposition, satisfaction will be also promoted. With the fundamental and scientific implementation of the presence of resident specialists as well as the benefit from the continuous services of resident specialists in the health systems, providing more than optimal service for the patients will be ensured, and thus, people can greatly benefit from health services.

## ACKNOWLEDGMENTS

The authors would like to thank all who sincerely helped in this study. Especially, we would like to appreciate the personnel and the staff of Statistics Department of MUMS.

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