

The effect of 24-hour presence of emergency medicine specialists on the performance of emergency department of Shahid Bahonar hospital, Kerman/Iran, 2013

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Abstract

Introduction: Emergency department is the most important part of a hospital and it seems that 24-hour presence of emergency medicine specialist can be effective in improving the performance of this ward. Therefore, the present study was performed with the aim of studying the effect of 24-hour presence of emergency medicine specialists in the emergency department of Shahid Bahonar hospital, Kerman/Iran.

Methods: In this mixed methods study, data collection was done through studying various related documents and semi-structured interview. Data analysis was performed using descriptive statistics and qualitative content analysis.

Results: The presence of emergency medicine specialists resulted in a decrease in waiting time, hospital's revenue growth, increase in number of requested laboratory tests, improvement of decision-making for patients and decrease of first 24-hour mortality rate. Economic benefits, improvement of the quality of services and emergency department management were among qualitative results of the present study.

Conclusion: In whole, 24-hour presence of emergency medicine specialists in the emergency department of Kerman Shahid Bahonar hospital has been effective in improving the performance and quality of services.

Keywords: Emergency medicine specialists, Emergency, Hospital, Emergency medicine's presence, Specialists

Introduction

Emergency Rooms (ERs) admit critically ill patients from pre-hospital ERs or other medical care centers. Meanwhile, this department always faces a crowd of outpatients who, for different reasons, have selected the ER for their treatment (1) and expect early and high-quality services. Therefore, ER is the most important part of a hospital admitting patients in physically critical condition and it is the responsibility of medical team and nurses working in ER to provide early high-quality medical care for these patients (2).

Basically ERs are very important in making a hospital popular and their function plays a significant role in general function of a hospital (3). Based on the studies performed in Iran (4,5) and other countries (6), emergency medicine field, with less than one decade history in our

country (7), can greatly help the improvement of ERs. Due to the special skill of emergency medicine specialists in managing this ward and designing its physical space as well as crisis management in hospital and society levels, emergency medicine specialists were deployed in the ER of Kerman Shahid Bahonar hospital in 2010. After passing two years of this measure, the present study was aimed to determine the efficacy of 24-hour presence of emergency medicine specialists in the performance of the emergency department of Shahid Bahonar hospital.

Methods

The present study was a practical study performed through mixed methods. Data collection was done through reviewing documents of financial affair office, medical documents office and statistics department as



well as patients' medical files during two 2-year periods of before continuous presence of emergency medicine specialists (2009-2010) and after that (2011-2012). Decision-making for patients in less than 6 hours, mortality rate, unsuccessful CPR, waiting time, discharge with personal consent, the ratio of emergency department expenditure to the hospital's total expenditure, the ratio of emergency department income to the hospital's total income and the number of requested diagnostic tests were considered as indices of evaluation. In qualitative part of study, purposeful sampling was used to identify participants with the following criteria:

1. Those who had history of cooperation with emergency medicine specialists
2. Those who had been benefitted from 24-hour presence of emergency medicine specialists
3. Those who had interest in participating in the study

The researcher referred to the work place of participants for interviewing them. A total of 16 interviews each lasted 20-30 minutes were performed. All interviews were recorded. Analysis of qualitative data was done using framework approach.

Results

Quantitative results

As it has been presented in Table 1, waiting time (from entering the ER until the first visit by physician) shows a downward trend.

After 24-hour presence of emergency medicine specialists in Kerman Shahid Bahonar hospital, decision-making for patients in less than 6 hours showed an upward trend. Moreover, mortality rate within the first 24 hours shows approximately a downward trend with some fluctuations. Mortality rate in the second 24 hours showed an upward trend with a sudden fall. In regard to expense, The ER share of hospital expenses had an upward trend and ER share of income has also increased. In relation to the ratio of successful resuscitations to failed ones, there was no data from March 2008 to March 2009. From March 2010, when this index has been defined in supervisory report

forms, the sinus fluctuations of recorded data did not allow us to judge about this index. There was a downward trend in the number of radiography clichés, while the number of requested diagnostic tests and discharges with patient's consent showed upward trends.

Qualitative results

Analysis of interviews resulted in identification of three major codes. Each of these topics and their sub-topics with some of the sentences expressed by interviewees are presented in the following part.

1. Economic effects

The presence of emergency medicine specialists in addition to affect the quality of healthcare services had also financial benefits for the hospital.

Definition of emergency services tariff

One of the problems of the studied hospital before the presence of emergency medicine specialists was lack of definite tariff for several services in the ER. The present study showed that the presence of emergency medicine specialists increases a part of hospital income; for example, one of the participants said: "Due to the presence of these specialists, insurance organizations are paying for approximately 500-600 items that is more than before" (10P).

2. Improvement of the quality of services

The analysis of interviews showed that the presence of emergency medicine specialists, due to preserving golden time, increasing patients' and personnel's satisfaction and 24-hour coverage by physician has caused improvement of services provided in ER of Shahid Bahonar hospital.

Preserving golden time in the treatment of patients

Early diagnosis and primary vital cares by emergency medicine specialists have caused significant improvement in saving patients' life. One of the participants said: "According to my job experience in this place, I believe that there has been 90% improvement of ER status and in re-

Table 1. Quantitative indicators of study

Indicator	Year				
	2008	2009	2010	2011	2012
Waiting time (min)	6.65	4.83	1.57	4.71	1.41
Decision-making for patients in less than 6 hours (%)	83.05	77.5	84.01	93.03	98.91
Mortality rate within the first 24 hours (per 1000)	0.7	1.6	1.4	1.4	1.5
Mortality rate in the second 24 hours (per 1000)	0.1	0.27	0.4	0.76	0.38
The ratio of emergency department expenditure (%)	–	0.38	1	1	1.04
The ratio of emergency department income (%)	7.67	18.06	23.01	30.70	32.11
The ratio of successful to unsuccessful revival (%)	–	–	12.08	28.4	22.9
The per capita of clichés (%)	0.16	0.26	0.38	0.56	0.61
The per capita of diagnostic tests (%)	0.3	0.41	0.5	0.33	0.38
The hospital leave with consent	0.62	1.2	1.5	2.5	3.8

gard save the patient's time the speed of patient's treatment process has been increased very much" (3P).

Increasing patients' satisfaction rate

Patient's satisfaction is one of the important indices of the quality of services. Twenty four-hour presence of emergency medicine specialists, immediate care at admission and early decision-making for the patient have caused to increase of satisfaction rate. One of the interviewees said: "All services are provided faster, diagnoses are better, patients are informed of their status faster and decision-making for patients is accelerated" (3P). Another participant said: "It has a very good effect when the patient is visited by a specialist at admission and is informed of his/her health status" (11P).

Increasing personnel's satisfaction rate and defining duties of executive personnel

Since the presence of emergency medicine specialists, due to their leader role and defining the duties of ER personnel, the duties of each member in this healthcare team has been clarified and this in turn has increased personnel satisfaction. One of the interviewees said: "Satisfaction has been increased very much and we are also more satisfied knowing exactly our job duties and the patient whose care is our responsibility. All these affect us very much" (4P).

Twenty four-hour presence of emergency medicine specialists

Permanent presence of emergency medicine specialists has a significant role in on-time and early patient care. One of the participants said: "Since the presence of emergency medicine specialists many problems have been really solved; even during night hours, these specialists are always present and the presence of order and arrangement in ER is really obvious" (5P).

3. The emergency department management

According to the present study, 24-hour presence of emergency medicine specialists has resulted in better and faster decision-making, clarification of inter/intra-ward relationships, improvement of department management, nursing system reporting and bed management.

Better and faster decision making for patients

Due to the nature of ER, patients should not remain in this ward and in the case of needing treatment, they should be admitted by specialty wards of hospital. The presence of emergency medicine specialists has increased the number of decision-makings for patients in less than 6 hours or less than 12 hours for those needed several services. One of the participants said: "The presence of emergency medicine specialists causes early decision-making for patients and they give written order for patient transfer to other wards. This is the most important role of emergency medicine specialists and now our patients, except in spe-

cial cases, do not stay more than 6 hours in ER" (4P).

Department management

Because of the role and importance of ER in hospitals, a powerful and efficient manager who can give suitable management suggestions and projects is necessary in order to attain an acceptable level of healthcare services. One of the interviewees said: "It is clear that the presence of emergency medicine specialists has caused order and arrangement" (5P). Another participant said: "Now a specialist has sat there and the resident should come and go on-time, the patient stay should not last more than 6 hours, the resident should visit the patient immediately and answers the phone calls more" (10P).

Clarification of inter/intra-wards relationships

Based on the emergency medicine texts, evaluation, resuscitation, diagnosis and care of emergency patients are duties of emergency medicine specialist. Therefore, a patient who has passed critical and risky conditions and needs other health services should be visited by the related specialist. The presence of emergency medicine specialist is helpful because he/she can refer the patient to the exact specialist. One of the participants said: "based on the verdict of the Ministry of Health, the emergency medicine specialists send the patient with a recognized diagnosis to other specialists and from this time that physician has the responsibility of patient" (4P).

Nursing system responding and reporting

After deploying emergency medicine specialists and consequently improvement of ER management, nursing service reporting has been improved. In fact, through dividing patients among nurses and defining their exact duties, nurses' reporting and responding have been improved. One of the participants said: "Nurses are more called to account, I do the works and then deliver the patient to the nurse who has the responsibility of this patient and that nurse composes nursing reports for the patient's file" (12P).

Bed management

Bed management is one of the important issues in ER and it was improved after the presence of emergency medicine specialists who accepted this responsibility. One of the participants said: "Emergency medicine specialist manages beds; that is, he/she manages and explains which bed should be freed or why. This shows the management role of emergency medicine specialist who has deployed this attitude" (14P).

Discussion

The observance of standard time of emergency services through investigating processes of providing special services and their improvement is essential and it should be

considered as one of the management priorities of ER in all planning (8). According to the present study, after 24-hour presence of emergency medicine specialists in the studied hospital, waiting time decreased. Arnold *et al* has reported that patients who refer to ER benefit from 24-hour presence of emergency medicine specialists (9).

In the present study, 24-hour presence of emergency medicine specialists was effective in decision-making for patients in less than 6 hours. Similarly, Hosseini showed that bed management in all work shifts associated with necessary executive guaranty and serious support of head of each healthcare center is effective in reducing ER overcrowding and decreasing patients' and their accompanies' dissatisfaction because of feeling wondering or being disregarded by personnel. This, in turn, causes improvement of the quality of ER services (10). The same results were observed in Kerman Shahid Bahonar hospital where ER bed management is performed by emergency medicine specialist. The beneficial effects of this measure can be seen on waiting time, decision-making for patients in less than 6 hours and the process of recovery. All interviews were in agreement with these findings.

The present study showed that 24-hour presence of emergency medicine specialist affects the mortality rate in emergency department. The first 24-hour mortality rate had a downward trend with some fluctuations. The second 24-hour mortality rate showed significant decrease in 2012. Soroush *et al* study has also showed reduction of mortality rate in the emergency department of Imam Khomeini hospital (5). This can be attributed to the reduction of waiting time and decision-making for patients in less than 6 hours.

In the present study, 24-hour presence of emergency medicine specialists increased the ratio of ER expense to income; that is, this ratio increased from 0.38 in 2008 to 1.04 in 2012. Along with expense increase, income increase from 7.68 to 32.11 is also noticeable. However, based on Kathan study in Netherland, the presence of emergency medicine specialist decreases patients' expenses, because it reduces the number of medical consultations. The presence of emergency medicine specialists not only is beneficial in reducing hospital expenses, but also saves patient's time in both educational and non-educational hospitals (11). The difference between these two studies might be attributed to the fact that emergency medicine has not found its real place in Iran hospitals and is still in its primary stages. Indeed, the present study, as opposed to Kathan study, was performed in an educational hospital. In Kathan study, just costs of blood and urine tests and radiographic costs have been considered as patients' costs, while in the present study, the costs of all requested laboratory tests and radiographies were evaluated. Richardson and Hwang showed that over-referring to emergency departments, because of high expense of referring to physicians' private offices is one of the most important reasons of increased expenses (12). These points can explain high

expense of ER in the present study. In other words, due to the higher cost of visit in physician's private office, patients refer to ERs in order to benefit from governmental tariff. In this study, the number of requested diagnostic tests showed an upward trend and the number of radiography clichés showed a downward trend. While, in Kathan study, both laboratory tests and radiography requests had significant decrease (11). Since emergency medicine physicians, as specialists, are competent to evaluate different indications and request tests for diagnosis, the number of requested laboratory tests showed upward trend.

In this study, the presence of emergency medicine specialists had no effect on discharge with patient's consent and this index showed an upward trend. According to Gougole and Khorgami study, encouraging patients toward giving consent for hospital leaving by residents is a common thing in educational hospitals of Tehran (13). This point can explain the upward trend of discharge with consent in the present study. However, according to some other researchers, this issue can be related to the conditions of patients and happens for various reasons such as coming from other cities, lack of the required specialist, patient's addiction or lack of insurance support. On the other hand, Soroush by comparing his results with the results of previous studies in regard to the percent of hospital leave with consent in Imam Khomeini hospital (11.2%) and Shariati hospital (13.8%) has reported a downward trend of 11.2% and has attributed this to the presence of emergency medicine specialists (5). Masoomi has also showed that after deploying emergency medicine specialists, hospital leave with patient's consent has decreased from 44.1% to 11.2% (4). These results differ with the results of the present study and it might be due to the fact that emergency medicine specialists have not found their real place in the studied hospital and among patients yet and probably the patients are unaware of their presence as a specialist who can decide for them. In a retrospective study by Fiscella *et al*, on 100,000 patients with Myocardial Infarction (MI), those who had been discharged with personal consent had received less invasive therapeutic interventions and had shorter ER stay. The risk of mortality or re-hospitalization due to MI or unstable angina in 2-year post-discharge period showed 40% increase in these patients (14). Similar to the present study, in Soroush study, patients of Imam Khomeini hospital had received more careful treatment services supervised by teaching physicians (5).

It seems that the presence of emergency medicine specialists in hospitals has a significant role in improving the quality of therapeutic and diagnostic processes of patients and their permanent presence in ERs prevents patients' confusion and provides a responding service. In the present study, due to ER specialty measures in regard to the diagnosis, waiting time decreased and ER stay showed downward trend.

In relation to the effect of 24-hour presence of emergency medicine specialists from the point of view of other spe-

cialists, nurses and other members of ER team, we found two groups of opposite opinions. However, even those who opposed with the efficacy of emergency medicine specialists presence, eventually have implicitly accepted the efficient role of these specialists. Kathan, in comparing hospitals that had used emergency medicine specialists and those that had not used them, has concluded that the presence of these specialists creates a better work climate in the hospital. Those who had worked with emergency medicine specialists had experienced better interpersonal support, interpersonal adjustment, commitment, interpersonal cooperation, team learning, co-workers' cooperation, and self-determination job role clarity in the team (11).

Conclusion

Department of emergency medicine is the most important part of a hospital. This department puts the first impression on patients and accompanies and it is obvious that this impression should be positive. Nurses working in ERs form one of the most important healthcare teams and the quality of healthcare services is greatly dependent on their work. One of the factors increasing nurses' job satisfaction is 24-hour presence of emergency medicine specialists in ER. Moreover, the presence of emergency medicine specialists has caused better cooperation with other specialists in a way that their continuous presence and performing primary measures related to other specialists has decreased the workload of those specialists. Continuous presence of emergency medicine specialists in ERs during the recent years has had positive effects on management of department, bed management, nurses' work environment and job satisfaction.

Ethical issues

This study was approved by ethical committee of Kerman University of Medical Sciences.

Authors' contributions

RG wrote this article, joint idea for publication, manuscript preparation, and review; MRA joint idea for publication, manuscript preparation, and review; MNM and ASN contributed to the review, discussion, and preparation of the manuscript and provided information on 24-hour presence of emergency medicine specialists on the performance of emergency department.

References

1. Salluzzo RF, Mayer TA. Emergency department management: principles and applications. St. Louis: Mosby; 1997.
2. Golaghie F, Sarmadian H, Rafiie M, Nejat N. A study on waiting time and length of stay of attendants to emergency department of Vali-e-Asr hospital, Arak-Iran. *J Arak Univ Med Sci* 2008; 11(2): 74-83. [In Persian]
3. Shaker SH. Investigation of patient's satisfaction and their relative from Hazrat Rasul hospital's emergency section. The first national conference of improving the quality of emergency management, Tehran University of Medical Sciences. 2001, Tehran, Iran . [In Persian]
4. Masoomi B. The effect of establishment of emergency medicine in improving the quality of emergency section at Al-zahra hospital [dissertation]. Al-zahra hospital: Isfahan University of Medical Sciences; 2010. [In Persian]
5. Soroush M. Comparison of quality indicators in diagnostic and therapeutic services in emergency sections of Imam khomeini and Dr Shariati hospitals, Tehran University of Medical Sciences, August - September [dissertation]. Tehran University of Medical Sciences; 2008. [In Persian]
6. Suter RE. Emergency medicine in the United States: a systemic review. *World J Emerg Med* 2012; 3(1): 5-10.
7. Development and educational planning commission. Terms and emergency medicine training program, Vtkhssy Council on Medical Education; 2008.
8. Allahverdi S. The average time to receive emergency care hospital Tehran Ayatollah Kashani 2011 . Tehran: Specialized media publications; 2011.
9. Arnold JL, Holliman CJ. Lessons learned from international emergency medicine development. *Emerg Med Clin North Am* 2005; 23(1): 133-47
10. Hosseini M. The importance of bed in the emergency department manager at medical centers. Seventh Annual Congress of Emergency Medicine, 2012. Tehran: Resane publications; 2012.
11. Kathan CD. Emergency physicians in the netherlands: the development and organizational impact of new multidisciplinary professionals in hospitals. University library of Groningen; 2008. Available from: <http://dissertations.ub.rug.nl/faculties/feb/2008/c.d.kathan/>
12. Richardson LD, Hwang U. Access to care: a review of the emergency medicine literature. *Acad Emerg Med* 2001; 8(11): 1030-6.
13. Gougole A, Khorgami Z. Investigate the causes and background rejection emergency patients in university hospitals resorting to deception involved in the emergency department. Seventh Annual Congress of Emergency Medicine, 2012. Tehran: Resane publications; 2012. p. 146.
14. Fiscella K, Meldrum S, Barnett S. Hospital discharge against advice after myocardial infarction: deaths and readmissions. *Am J Med* 2007; 120(12): 1047-53.