

Clinical Audit of Emergency Department Triage: The Impact of Interventional Strategies

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Abstract

Background and Objectives: The Iranian Ministry of Health and Medical Education (MOHME) has obligated health settings to follow the reference guidelines developed by the ministry in implementing the emergency department triage system. The present study aimed at auditing the compliance of the emergency department triage system in Shahid Madani Hospital in terms of compliance with MOHME guidelines, and to explore the impact of appropriate interventions in enhancing this compliance.

Methods: A check list developed based on the ministry's guidelines was used as the study instrument. Two areas including inputs and processes were surveyed. After auditing the initial state of the triage system, interventional strategies such as keeping the triage active in the afternoon and night shifts, allocation of welcoming patient carrier, and training the staff on the standards of triage system were implemented, and the triage system was re-audited. Descriptive statistics and graphs were used to describe the results. T-test was used to compare the degree of compliance pre- and post-intervention.

Findings: Before introducing the intervention, a compliance degree of 80, 62 and 88% (the standards of physical space, staffing, facilities and equipment, respectively) and 80%, 14% and 67% (to service process, logistic process and management process, respectively) was identified, respectively. After implementation of the intervention, the degree of compliance was found to be 80, 87, 92% for the three former areas, and 90%, 14% and 100% for the three latter areas, respectively. The overall degree of compliance showed a significant increase from 75% to 82% post-intervention ($P = 0.028$).

Conclusions: Adherence of the emergency department triage system to the reference standards can be improved by implementing relevant interventional strategies. The gap between degree of compliance after intervention and the ideal situation, however, shows the need for more comprehensive identification of the shortcoming and devising appropriate strategies.

Keywords: Clinical audit, Triage, Emergency Department, Hospital management

Background and Objectives

The emergency department (ED) is the first point of contact with the hospital for many patients, and is one of the main ways to enter the hospital and get served. If the ED gains the satisfaction of its visitors, such first contacts may have a powerful impact on creating a positive image of the hospital in the mind of the

general public.

Within the ED, the triage process is the first point to examine the patients. Triage also is the first point to document the patient's data. The triage process prioritizes the ED visitors with the aim of detecting those who have a severe condition and thus cannot wait safely for receiving the care [1]. In other words, the purpose of the triage is to decrease the rate of morbidity and mortality.

The Iranian Ministry of Health and Medical Education- Iran has recently implemented the Clinical Governance and the accreditation systems to improve the

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quality of the services and the clients' satisfaction with the healthcare system. Clinical audit is one of the ways to improve the quality, and one of the pillars of the clinical governance. Thus, regarding the importance of triage in caring the ED visitors and the low experience of the hospitals of the country on triage, it can be an appropriate subject for audit. Also the few previous studies at hand show that the ED triage needs attention [2-4].

The Ministry has issued the instructions for implementation of the Emergency Department Triage System [5], and recommended the Emergency Severity Index (ESI) as the appropriate triage system for Iranian hospitals [6]. The ESI is a five-level triage system, which was first developed in the USA [7] and then, besides the hospitals of the USA [8-11], spread out around the world [12, 13]. The system has been revised three times and the fourth version of it is available [14].

After receiving the instructions, Shahid Madani Hospital, like many other hospitals, implemented the triage system according to the instructions devised by the ministry. Since the officials of the hospital were willing to examine the degree to which the triage system of the hospital ED is implemented correctly, the present study was conducted with the aim of comparing the triage of the study ED with the predefined national standards.

Methods

This study took place with a before-after design as a clinical audit in two areas of inputs and process in fall 2013. The study site was the ED of Shahid Madani Hospital, Tabriz, Iran. The hospital is a single specialty for heart. The study protocol was approved by the Ethics Committee of Tabriz University of Medical Sciences.

This audit was performed based on the Audit Cycle. In the first stage the national standards regarding the ED triage were gathered. Then the triage of the study ED was compared against the standards. The reasons for lack of concordance were investigated, solutions were provided and interventions were formulated. One month post-intervention, the audit was repeated (re-audit).

The study tool was a checklist developed based on the national standards (5, 6, 15-20), and was designed as two option questions (Yes-No). The checklist included two areas of inputs and process. The inputs section was comprised of 44 items divided into three dimensions including physical space (10 items), staff-

ing (8 items), and facilities and equipment (26 items). The process section had 19 items organized as service process (10 items), logistic process (6 items) and management process (3 items). One point was given to each question. The answer "Yes" got a point and the answer "No" had no points. To describe the results the descriptive statistics and graphs and the Microsoft Excel 2007 software were used. One Sample T-test was used to compare the results of the audit and re-audit at a significance level of 0.05. The test was performed using the SPSS software (ver. 16).

Results

Primary investigation using the checklist showed that the studied ED complies with 82% of the input standards (36 out of 44 items) and with 58% of the process standards (11 out of 19 items). In the inputs section, 8 out of 10 items relating to physical space, 5 of 8 items relating to staffing, and 23 out of 26 items relating to facilities and equipment gained the Yes answer. In the process section of the checklist, 8 out of 10 items relating to the service process, 1 out of 6 items relating to the logistic process, and 2 out of 3 items relating to the management process had a positive answer and thus got the points. Table 1 shows the results of the primary investigation.

The most important cases of non-compliance with the standards in the primary investigation were as follows:

There was not enough sight in the triage place to see the visitors of the ED before they enter the department.

The triage location was not designed such that the privacy of the patients is respected.

There was not an alarm system in the triage to call the Code Team upon seeing an un-well patient.

The triage personnel were not in place in the afternoon and night shifts.

Some nurses of the ED were not trained on the used triage system.

There was no welcoming patient carrier at the triage to carry the patients.

According to the statements of the nurses of the ED, the security officers had not sufficient cooperation with the triage nurse.

Due to the absence of the triage personnel in the afternoon and night shifts, some ED visitors were not triaged.

The monthly meetings of the hospital's triage committee were not held. Then some issues existed including: reviewing the triage process by the committee, providing the triage nurses with feedback, and report-

ing to the triage committee of the pertaining university.

There was not a pulse oximeter at the triage to examine the vital signs of the visitors.

The powers and duties of the triage nurse were not documented.

In a meeting with the officials of the ED, the nursing office of the hospital and the external members of the audit team, the problems were reviewed and it was decided that the following interventions be implemented:

Activating the triage in the afternoon and night shift: To do this, a nurse was put into the triage during the afternoon shift; also a nurse was devoted to the ED from the nursing staff of the hospital to enable the ED to assign a nurse to the triage task.

Holding a training workshop: To do this, a training workshop was held on the Emergency Severity Index (ESI) triage, which is recommended by the Iranian Ministry of Health and Medical Education.

Allocation of welcoming patient carrier: To do this, it was decided that one of the nursing assistants in each work shift be at triage place as welcoming patient carrier to move the visitors of the ED.

Regarding *the security officers and their absence at the triage place*, it was spoken with the head of the hospital's security office.

A new pulse oximeter was devoted to the triage.

The powers and duties of the triage nurse were extracted from the relevant texts and instructions and then documented.

The results of the re-audit, which was conducted one month after the primary investigation, showed that the compliance with the standards of the triage was increased to 89% in the *input* standards (39 items out of 44), and to 68% in the *process* standards (13 items out of 19). In the *inputs* section, 8 of 10 items relating to the physical space dimension got a positive answer. In the staffing dimension, 7 out of 8 items got a positive answer. In the facilities and equipment dimension 24 out of 26 items got the score of the positive answer. In the *process* section, 9 out of 10 items relating to the service process, 1 out of 6 items relating to the logistic process, and 3 out of 3 items relating to the management process got the score of the positive answer. Table 2 shows the results of the re-audit.

Figure 1 compares the results of the audit (primary investigation) and the re-audit (after intervention). As it is seen, an improvement has occurred in 4 out of the 6 dimensions of the checklist. We compared the total compliance with the standards in the pre- and post-intervention phases using the One Sample T-test. The results showed that the improvement was statistically significant ($P = 0.028$).

Table 1 Results of the investigation of triage in the Emergency Department of Shahid Madani Hospital of Heart

Section	Dimension	No. Items	Score
Inputs	Physical space	10	80%
	Staffing	8	62%
	Facilities and equipment	26	88%
Process	Service process	10	80%
	Logistic process	6	14%
	Management process	3	67%
Total		63	75%

Discussion

According to the performed investigations and comparing the triage of the Shahid Madani Hospital's ED against the national standards, the overall adherence to the standards in the pre- and after-intervention phases was 75% (47 items out of 63) and 82% (52 items out of 63), respectively.

Relying solely on the numbers may mislead us to come to the conclusion that the triage of the studied ED has had not so bad situation (75% compliance with the standards). However, regarding the nature of the non-compliance cases, it seems that there were important issues for improvement such as presence of triage nurse at all working shifts and triaging all visitors of the ED [6].

Since it is needed for all nursing staff of the ED to pass a course on routine triage system [6], a training workshop was held by the professors of the Department of Emergency Medicine, School of Medicine, Tabriz University of Medical Sciences. The workshop included both theoretical materials and practical case scenarios. Such training and retraining programs would improve the consistency of the triages and would keep the nurses up-to-date about the latest

Table 2 Results of the re-audit of triage in the Emergency Department of Shahid Madani Hospital of Heart, Tabriz, Iran

Section	Dimension	N. Items	Score
Inputs	Physical space	10	80%
	Staffing	8	87%
	Facilities and equipment	26	92%
Process	Service process	10	90%
	Logistic process	6	14%
	Management process	3	100%
Total		63	82%

knowledge on triage (21).

Another non-compliance with the standards was lack of an alarm system to call the code team. It is stated that the studied ED has been designed in such a way that the triage nurse can easily call the code team verbally. However this would not prevent us from future development of an electronic alarm system to call the code team. With such alarm system, the triage nurse would warn all workers of the ED about the serious condition of the incoming patient.

In this study, the logistic process of the triage had the lowest score. Its items of the checklist were related to the triage committee of the hospital. It was agreed by the hospital's top managers that the monthly meetings of the hospital's triage committee be held in the next months regularly. The committee would evaluate the triage, feedback the nurses, and report to the triage committee of the pertaining university.

Jabbari *et al.* assessed the waiting times in the ED, and emphasized that existence of a standard triage system would decrease the waiting times [2]. It can be expected that activating the triage in the afternoon and night shifts in this study would improve the patient flow, decrease the waiting time, and as a result, improve the patient's outcome and satisfaction.

A study in one of the hospitals of the Tabriz city showed that physicians in case of only 39% of the patients agreed with the triage nurses. Such high rate of over- and under-triage made the triage an issue that needs attention [3]. Another study in the same city reported that the triage sheet for about two third of the ED visitors was not completed properly [22]. Tabibi *et al.* also suggested the revision of service processes in the hospital EDs [4].

By considering the findings of these studies and those from the present study, we can conclude that triage is not implemented properly. This may be due to the novelty of the issue in the hospitals of the country and thus the little experience of the hospitals in this area. Then it seems a need for a tool to regularly evaluate and improve the triage process. The checklist developed in this study can act as such a tool in the input and process areas. Yet the checklist can be improved specially in the process section. It can also be extended to the outputs of the triage; however the checklist has a limitation. It gives the same value for all items. But in the real world, the items weigh differently.

Conclusions

This clinical audit was performed in two areas of inputs and process. It found 75% adherence to the standards,

and by implementing some interventions, the rate raised to 82%. The improvement was statistically significant. Although important interventions have been implemented in this audit, we need information about the outputs to provide us with a comprehensive picture of the triage.

Abbreviations

(ED): emergency department; (ESI): emergency severity index

Competing Interests

The authors declare no competing interests.

Authors' Contributions

JST was involved in designing the study, and developing the study tool. MPA was dealt with developing the study tool, and conducting the study. LA conducted data collection and analysis. AD was involved in designing the study, analyzing the data, and drafting the manuscript. SS contributed in collecting the data and conducting the study. RY was involved in designing the study and collecting the data. All authors read and approved the final manuscript.

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