Quality improvement of triage accuracy in the emergency department
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ABSTRACT

Introduction: Triage is the sorting of patients into priority groups according to their need and severity of clinical condition. The study aims to present outcome of complete audit cycle of triage by the triage nurse for quality improvement of triaging in Emergency.

Method: 150 patients were randomly selected over 2 weeks who were triaged by the Emergency triage nurse into Emergency (Red), Priority (Yellow) and Queue (Green) in the Emergency Department at Patan Hospital. We followed the WHO quick check triage and assessed those who were accurately triaged, over triaged and those who were under triaged. The necessary changes were done after analysis of data from first cycle and same process was repeated for second cycle. In the second cycle, 150 patients were selected randomly over 2 weeks who were triaged by the Emergency triage nurse. Plan-Do-Study-Act (PDSA) cycle was used for quality improvement cycle.

Result: Data were collected from 150 patients in the first cycle and 150 patients in the second cycle. In the first cycle, 48.7% of patients were correctly triaged, 48.7% were over triaged and 2.7% were under triaged. After the second PDSA cycle, it was found that 65.3% of patients were correctly triaged, 33.3% were over triaged and 1.3% were under triaged.

Conclusion: Accuracy of triage can be improved by continuous quality improvement audit and necessary interventions. Plan-Do-Study-Act (PDSA) cycle is a useful tool for quick detection of problems and acting on necessary interventions for improvement

Keywords: audit, emergency department, triage

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INTRODUCTION

The Emergency Department of the hospital addresses immediate interventions for those patients seeking urgent and critical needs. Triage is the first encounter between patient and the health care provider when patient comes to the emergency. It is the sorting of patients into priority groups according to their need and the severity of their condition. Currently, at Patan Hospital, we follow the WHO quick check triage and triage patient into Emergency (Red), Priority (Yellow) and Queue (Green).

The Emergency Department at Patan Hospital receives about 150-200 patients per day. The process of triage is done by the triage nurse and the Emergency cases (Red) are handed over directly by the triage nurse to the observation medical officer. Although the aim of the triage nurse is to accurately triage the patient, there still remains a risk that patient could be erroneously triaged. If the patient is over triaged, scarce resources could be wasted and if patient is under triaged, it can have serious clinical consequences.

The study aims to present the outcome of complete audit cycle of triage by the triage nurse for quality improvement of triaging in the emergency.

METHOD

We randomly selected 150 patients over 2 weeks who were triaged by the Emergency triage nurse into Emergency (Red), Priority (Yellow) and Queue (Green) in the Emergency Department at Patan Hospital. We followed the WHO quick check triage and assessed those who were accurately triaged, over triaged and those who were under triaged. This data collection cycle was called first cycle.

Plan-Do-Study-Act (PDSA) cycle which is a standard method of quality improvement cycle was used for this study. The study was conducted in Emergency department at Patan Hospital from November 18, 2019 to December 17, 2019. The permission to conduct this audit was taken from the department. The necessary changes were done after analysis of data from first cycle and same process was repeated for second cycle.

Data analysis- Frequency and percentage of patients who were triaged as Emergency, Priority and Queue as per WHO quick check triage was calculated. The frequency and percentage of patients who were accurately triaged, over triaged and those who were under triaged was also tabulated.
RESULT
Data were collected from 150 patients in the first cycle and 150 patients in the second cycle. As per WHO quick check triage, the triage nurse triaged 10% of patients into Emergency, 85.3% of patients into Priority and 4.7% into Queue in the first cycle (Table 1). It was found that 48.7 % of patients were correctly triaged, 48.7% were over triaged and 2.7% were under triaged. In the second cycle, 13.3% of patients were triaged into Emergency, 84% of patients into Priority and 2.7% into Queue (Table 2). After the second PDSA cycle, it was found that 65.3% of patients were correctly triaged, 33.3 % were over triaged and 1.3% were under triaged.

**Table 1. Comparison of patients in triage categories in first and second cycle as per WHO quick check triage**

<table>
<thead>
<tr>
<th>Triage category</th>
<th>First cycle</th>
<th></th>
<th>Second cycle</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage</td>
<td>Frequency</td>
<td>Percentage</td>
<td></td>
</tr>
<tr>
<td>Emergency</td>
<td>15</td>
<td>10</td>
<td>20</td>
<td>13.3</td>
<td></td>
</tr>
<tr>
<td>Priority</td>
<td>128</td>
<td>85.3</td>
<td>126</td>
<td>84</td>
<td></td>
</tr>
<tr>
<td>Queue</td>
<td>7</td>
<td>4.7</td>
<td>4</td>
<td>2.7</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2. Comparison of accuracy of triage in first and second cycle as per WHO quick check triage**

<table>
<thead>
<tr>
<th>Accuracy of triage</th>
<th>First cycle</th>
<th></th>
<th>Second cycle</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage</td>
<td>Frequency</td>
<td>Percentage</td>
<td></td>
</tr>
<tr>
<td>Over triage</td>
<td>73</td>
<td>48.7</td>
<td>50</td>
<td>33.3</td>
<td></td>
</tr>
<tr>
<td>Correct triage</td>
<td>73</td>
<td>48.7</td>
<td>98</td>
<td>65.3</td>
<td></td>
</tr>
<tr>
<td>Under triage</td>
<td>4</td>
<td>2.7</td>
<td>2</td>
<td>1.3</td>
<td></td>
</tr>
</tbody>
</table>

**DISCUSSION**
After analysis of data of first and second cycle, it was observed that accuracy of triage improved from 48.7% to 65.3%. It was still below our standard target of 80%.

According to a study carried out by Mostafa, et al. in Iran, they found that the challenges faced in triage were mostly related to nursing personnel and management challenges. The challenges related to nursing personnel were lack of clinical competency and lack of psychological capability. The management challenges were challenges related to human resources, structural challenges and performance challenges. In our study, we found that increased flow of patients in triage area, failure of triage nurse to update themselves in skills or knowledge and non-compliance were major barriers that hindered accuracy of triage. Studies suggested that regular triage training, collaboration between emergency departments and continuous monitoring were crucial to improve the nurse’s triage performance.  

We used Plan-Do-Study-Act (PDSA) cycle for this quality improvement audit but concerns have been raised on the complexity and appropriateness. However, it can be used for quick detection of problems for desired intervention for improvement. This quality improvement audit needs to be continued for making it sustainable. Studies have shown that quality improvement cycle improves various aspects of care in clinical practice.

**CONCLUSION**
Accuracy of triage can be improved by continuous quality improvement audit and necessary interventions. Plan-Do-Study-Act (PDSA) cycle is a useful tool for quick detection of problems and acting on necessary interventions for improvement.

**REFERENCES**
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