

## Improving Vital Signs Measurement and Documentation in the Triage Room: A Quality Improvement Project

Najla Mahmood Shamsi, MD\*

**Objective:** To improve the local health center triage process.

**Design:** A Retrospective Study.

**Setting:** Hamad Town Health Center, Ministry of Health, Bahrain.

**Methods:** Vital signs documentation was conducted from 1 June 2017 to 30 November 2017. The percentage of the recorded vital signs was documented, the reasons for missing vital signs data were analyzed and designed and implemented an intervention to improve recording the vital signs; finally, the percentage of the recorded vital signs post-intervention was evaluated. Pre-intervention data from 1 January 2017 to 28 February 2017 were documented. Post-intervention data were collected from all patients seen and registered from 1 September to 31 October.

**Results:** A total of 2,688 clinical records were included in this study; 1,473 were collected during the pre-intervention period and 1,215 were collected post-intervention. During the pre-intervention period, 4/1473 (0.27%) vital signs were correctly recorded. The post-intervention data revealed improvement in the vital signs from 0.27% (4/1473) to 10.29% (125/1215).

**Conclusion:** Implementing a formal quality improvement project improves vital sign documentation in the triage room.

*Bahrain Med Bull 2018; 40(3): 171 - 173*

The triage clinic is established in local health centers due to the increase in patient load<sup>1</sup>. The purpose of the triage clinic is initial assessment and to classify patients according to the urgency to avoid delay in the treatment of critical cases<sup>2</sup>. Vital signs measurement and documentation by the triage nurses (temperature, heart rate, blood pressure, respiratory rate and oxygen saturation as needed) is necessary to prioritize the urgency of the cases according to most triage systems worldwide including the Manchester Triage System, Emergency Severity Index (ESI), the Canadian Triage and Acuity Scale and the Australian Triage Scale<sup>3,4</sup>.

It is important to measure and document the vital signs of the patients triaged for initial assessment. Previous studies indicate that vital signs measurement is used as one of the tools to make a decision, prioritize the patients and stream them to the right disposition. They were often used as a decision-making tool in the prioritization of patients and streaming to the right disposition.

In the Kingdom of Bahrain, few studies were performed to assess triage clinics and their efficiency in triaging patients. A study was performed to assess the impact of triage by physicians; however, no studies were performed to assess the nursing triaging skills or the measurement and registration of vital signs<sup>5</sup>. Introducing a quality project will improve the measurement and registration of vital signs<sup>6</sup>.

The aim of this study is to improve the local health center triaging process by improving the percentage of vital signs measurement and registration.

### METHOD

The study was conducted from 1 June 2017 to 30 November 2017. Data were documented from the triage records. The pre-intervention data were documented from all patients seen and registered by the triage nurse from 1 January 2017 to 28 February 2017 (2 months). The triage nurses illustrated the results of the initial audit and stressed the importance of vital signs documentation in improving the quality and safety of the triage process. The post-intervention data were collected from all patients seen and registered by the triage nurse from 1 September 2017 to 31 October 2017 (2 months).

The triage was classified into three, with different colors. These colors reflect the priority, from low to high (green, yellow and red).

The data were entered in Microsoft Excel and analyzed using descriptive analysis.

### RESULT

A total of 2,688 clinical records were included in this study; 1,473 were documented in the pre-intervention, from January to February 2017 and 1,215 were collected in the post-

---

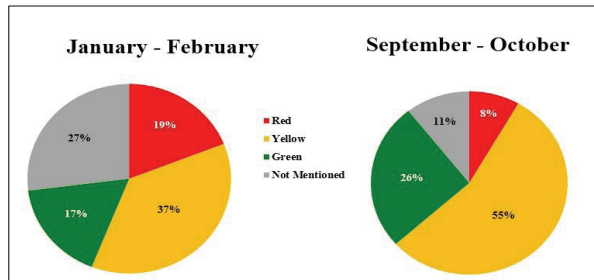
\* Family Physician  
Hamad Town Health Center  
Kingdom of Bahrain  
E-mail: dr.nshamsi@gmail.com

**Table 1: Pre-Intervention and Post-Intervention Documentation of Vital Signs for Each Category**

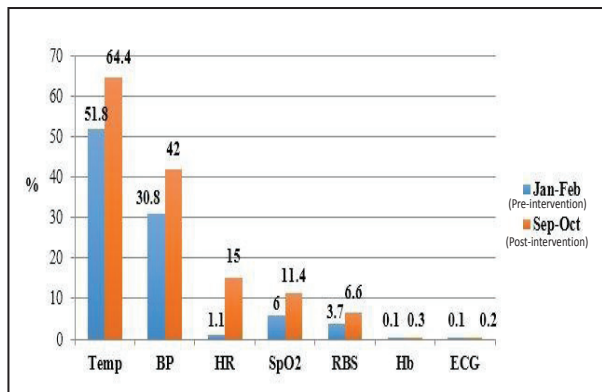
	Red		Yellow		Green		Not Labelled		Total	
	Pre-(1,473)	Post-(1,215)	Pre-(1,473)	Post-(1,215)	Pre-(1,473)	Post-(1,215)	Pre-(1,473)	Post-(1,215)	Pre-(1,473)	Post-(1,215)
Temp	136 (9.2%)	67 (5.5%)	313 (21.2%)	451 (37.1%)	114 (7.7%)	193 (15.9%)	200 (13.6%)	71 (5.8%)	763 (57.8%)	782 (64.4%)
BP	73 (4.9%)	42 (3.5%)	179 (13.4%)	278 (22.9%)	59 (4%)	138 (11.4%)	136 (9.2%)	52 (4.3%)	447 (30.3%)	510 (41.9%)
HR	9 (0.6%)	24 (1.9%)	4 (0.3%)	109 (8.9%)	0	27 (2.2%)	3 (0.2%)	23 (1.9%)	16 (1.1%)	183 (15.1%)
RR	0	0	0	0	0	0	0	0	0	0
SpO2	27 (1.8%)	20 (1.6%)	32 (2.2%)	79 (6.5%)	6 (0.4%)	23 (1.9%)	23 (1.6%)	17 (1.4%)	88 (5.9%)	139 (11.4%)
RBS	11 (0.7%)	10 (0.8%)	19 (1.3%)	45 (3.7%)	8 (0.5%)	10 (0.8%)	16 (1.1%)	15 (1.2%)	54 (3.7%)	80 (6.6%)
Hb	1 (0.1%)	0	1 (0.1%)	2 (0.2%)	0	1 (0.1%)	0	1 (0.1%)	2 (0.1%)	4 (0.3%)
ECG	1 (0.1%)	1 (0.1%)	0	0	0	1 (0.1%)	0	1 (0.1%)	0	3 (0.2%)
Pain score	0	0	1 (0.1%)	0	0	0	0	0	0	0
<b>Total</b>	<b>277 (18.8%)</b>	<b>101 (8.3%)</b>	<b>545 (36.9%)</b>	<b>669 (55.1%)</b>	<b>255 (17.3%)</b>	<b>316 (26%)</b>	<b>396 (26.9%)</b>	<b>129 (10.6%)</b>	<b>1473 (100%)</b>	<b>1215 (100%)</b>

**Red** Immediate, Life-threatening disease  
**Yellow** Delayed, Non-life-threatening disease  
**Green** Minimal, Minor disease

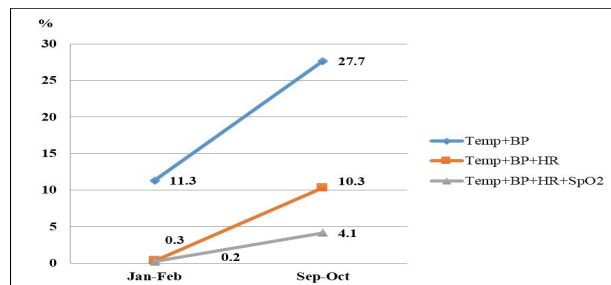
intervention, from September to October 2017. During the pre-intervention period, 4/1473 (0.27%) of the records had complete vital signs documented. The completed mandatory vital signs record for the cases improved to 125/1215 (10.29%) in the post-intervention period. This study also revealed improvement in the documentation of temperature and blood pressure of each record from 11.3% to 27.7%. Trauma patients, burn and triaged cases as green were representing the majority of the patients in whom vital signs data were missing.



**Figure 1: Percentage of Cases in Each Category**



**Figure 2: Pre-Intervention and Post-Intervention Vital Signs Documentation**



**Figure 3: Pre-Intervention Period versus Post-Intervention Period**

**DISCUSSION**

The study revealed the importance of measuring and registering vital signs by the triage nurses through a presentation. Our study found that this method is effective in improving the performance of the triage nurses.

The poor recording system of the vital signs found in this study was similar to the low compliance rate and poor recording system in other studies<sup>7</sup>.

The low rate of vital signs registration in the triage clinic record might be related to insufficient time, resources and distraction from multi-task given to the triage nurse<sup>8</sup>.

In this study, we have studied the records of two months in the pre-intervention period and two months only in the post-intervention period. The limited number of the records might be affected by the season. There was a number of missing data and many cases were not classified into the categories according to the urgency. In this study, an improvement in the registered classification and reduction in the missing data was found from 27% missing data to 11%.

Vital signs are mandatory for effective and accurate triaging

and continued safe decisions in prioritizing and streaming the patients to the appropriate care. The physicians' satisfaction was not studied but was observed from their verbal feedback.

## CONCLUSION

**Teamwork and implementation of quality could improve vital signs documentation at triage. Nursing compliance of vital signs documentation has improved through education and training.**

---

**Author Contribution:** All authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes.

**Potential Conflicts of Interest:** None.

**Competing Interest:** None.

**Sponsorship:** None.

**Acceptance Date:** 24 June 2018.

**Ethical Approval:** Approved by the Primary Health Care, Ministry of Health, Bahrain.

## REFERENCES

1. Schellein O, Ludwig-Pistor F, Bremerich DH. Manchester Triage System: Process Optimization in the Interdisciplinary Emergency Department. *Anaesthesist* 2008; 58:163–170.
2. Azeredo TR, Guedes HM, de Almeida RA, et al. Efficacy of the Manchester Triage System: A Systematic Review. *International Emergency Nursing* 2015; 23(2):47-52.
3. Christ M, Grossmann F, Winter D, et al. Modern Triage in the Emergency Department. *Deutsches Ärzteblatt International* 2010; 107(50):892.
4. Nejad HH, Banaie M, Davarani SH, et al. Evaluation of the Significance of Vital Signs in the Up-Triage of Patients Visiting Emergency Department from Emergency Severity Index Level 3 to 2. *Acta Medica Iranica* 2016; 54(6):366-9.
5. Fateha BE, Hamza AY. Impact of Triage in Accident and Emergency Departments in Bahrain. *La Revue de Sante de la Mediterranee Orientale* 2001; 7(4-5):812.
6. di Martino P, Leoli F, Cinotti F, et al. Improving Vital Sign Documentation at Triage: An Emergency Department Quality Improvement Project. *J Patient Saf* 2011; 7(1):26-9.
7. Elizabeth L, Tysinger RN. How Vital Are Vital Signs? A Systematic Review of Vital Sign Compliance and Accuracy in Nursing. *Journal of Science and Medicine* 2015; 1(1): 68-75.
8. Teixeira CC, Boaventura RP, Souza AC, et al. Vital Signs Measurement: An Indicator of Safe Care Delivered to Elderly Patients. *Texto Contexto Enferm* 2015; 24(4):1071-8.