

**SHORT COMMUNICATION****Implementation of a triage score system in an emergency room in Timergara, Pakistan**M. K. Dalwai,^{1,2} K. Tayler-Smith,³ M. Trelles,⁴ J-P. Jemmy,⁴ J. Maikéré,¹ M. Twomey,² M. Wakeel,⁵ M. Iqbal,¹ R. Zachariah³<http://dx.doi.org/10.5588/pha.12.0083>

Following implementation of the South African Triage Scale (SATS) system in the emergency department (ED) at the District Headquarter Hospital in Timergara, Pakistan, we 1) describe the implementation process, and 2) report on how accurately emergency staff used the system. Of the 370 triage forms evaluated, 320 (86%) were completed without errors, resulting in the correct triage priority being assigned. Fifty completed forms displayed errors, but only 16 (4%) resulted in an incorrect triage priority being assigned. This experience shows that the SATS can be implemented successfully and used accurately by nurses in an ED in Pakistan.

Emergency triage is the systematic process of determining patients' priority for treatment based on the severity of their condition. The principle aim of triage is to ensure that patients receive the most appropriate level and quality of care relative to their clinical status and need.¹

Since 2009, Médecins Sans Frontières (MSF) has been working in Pakistan in collaboration with the Ministry of Health (MoH) to strengthen emergency department (ED) care at the District Headquarter (DHQ) Hospital in Timergara in the North-Western Province of Khyber Pakhtunkhwa. At the outset, no formal triage system existed, and with a very high emergency patient caseload and overstretched staff, critically ill patients were often missed or seen only when their clinical condition had deteriorated. Anecdotal evidence suggested that ED mortality rates were very high. The need for a triage system was identified with reports from other resource-poor settings showing that the process of triage can improve patient flow and reduce patient waiting times and mortality.^{2,3}

As one of the only validated triage tools that exists for the triage of adults specifically in resource-poor settings, we chose to pilot the South African Triage Scale (SATS)^{4,5} in Pakistan. The SATS was devised for use in both pre- and in-hospital emergency units throughout South Africa to address the increasing health burden on emergency care services in the country, in particular the high numbers of severe emergency cases, medical staff shortages and limited resources.⁵ Implementing the SATS in Pakistan was justified by the fact that Pakistan and South Africa are both developing countries facing similar challenges in the delivery of emergency medical care, and both are faced with high

caseloads of trauma patients (66 trauma presentations per 1000 patients in South Africa and 41/1000 in Pakistan).^{6,7} The SATS system has been validated in South Africa and has been implemented in various other settings such as Malawi,⁸ Botswana⁹ and Ireland.¹⁰ However, its use in an Asian setting has not yet been formally examined.

Based on our experience in Pakistan, we 1) describe how the SATS was implemented, 2) report on how accurately emergency staff were able to use the system, and 3) discuss the lessons learnt.

METHODS**Design**

A cross-sectional study involving an audit of routine clinical data.

Setting and population

Timergara DHQ Hospital is situated in Timergara town, in the rural and relatively insecure district of Lower Dir, Pakistan. The hospital serves a catchment population of approximately 1.8 million. The ED has a capacity of 18 beds and a monthly caseload of about 4000 patients. The main caseload is medical emergencies, typically cardiac and diabetes-related illnesses, with a proportion of trauma cases (mostly due to road traffic accidents).

The study involved the cross-checking of a series of triage forms completed for patients triaged at the ED between 27 June and 3 July 2011.

SATS and its implementation

The SATS uses a physiologically based scoring system, the Triage Early Warning Score (TEWS), and a list of discriminators designed to triage patients into one of five colour-coded priority groups for medical attention.⁵ The colour categories are as follows: 1) red, immediate priority; 2) orange, very urgent priority; 3) yellow, urgent priority; 4) green, delayed priority (minor injuries/illness); and 5) black, dead.

The SATS was implemented in the Timergara ED in June 2011. Table 1 indicates the measures and activities undertaken 1) before the introduction of the SATS and 2) during the month following its introduction.

Once the SATS was introduced, triage was routinely undertaken by two triage nurses, supervised by the local doctor. Post triage, patients were directed

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KEY WORDS

emergency triage; South African Triage Scale; Pakistan

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TABLE 1 Measures and activities undertaken before and after the SATS was introduced in Timergara Emergency Department, Pakistan

1 Before introduction of the SATS
Approval*
<ul style="list-style-type: none"> Extensive discussions with the following hospital bodies and authorities to obtain permission to introduce the SATS and carry out the related ED care delivery changes (April–June 2011) <ul style="list-style-type: none"> –Hospital unions –Hospital superintendent –District health authorities (Ministry of Health)
Information dissemination
<ul style="list-style-type: none"> Community awareness raising and sensitisation through discussions with religious leaders about how entry into the ED would change, why it would change and what the ED triage process would involve (May 2011) Dissemination of written information in the local language (leaflets and billboards) around the hospital for both staff and patients explaining the planned changes to the ED and the triage process (May 2011) Briefing of hospital staff about the proposed ED changes and triage, including security guards and cleaners, as these are the first point of contact for many patients coming to the hospital (May 2011)
Infrastructure
<ul style="list-style-type: none"> Erection of a dedicated triage room outside the ED; patients were only able to enter the ED from the triage room, ensuring that the triage post was the first point of contact for patients presenting at the ED; previously patients could enter the ED via multiple points
Training
<ul style="list-style-type: none"> Training in the SATS of the local doctor (2 × 2h sessions with one practical session), conducted by the medical doctor in charge, who had background experience of working with the tool and who received collaborative support from the chief implementation officer of the SATS from the Western Cape in South Africa (May 2011) One-hour nurse training sessions in the SATS conducted by the local doctor (May 2011)
2 During the month following the introduction of the SATS
<ul style="list-style-type: none"> Measures put in place to ensure patient privacy, particularly for women <ul style="list-style-type: none"> –Outside the triage room, two waiting areas established, one for men and one for women –Guards permitting just two patients and two care givers into the triage room at a time –Curtains dividing the triage room into single patient areas Ongoing support by the medical doctor in charge for the first 2 weeks of triage Supervision of staff nurses carrying out the triage by the local doctor

*Due to complex political influences within the hospital, it was important to seek permission from the different authorities in the correct hierarchical sequence for a favourable agreement to be reached. These permissions were later captured in a written Memorandum of Understanding.

SATS = South African Triage Scale; ED = emergency department.

to the appropriate care posts depending on their designated colour code.

Data collection and analysis

One month after the introduction of the SATS, during which various process issues, such as ensuring efficient patient flow into the ED triage room, were able to be properly established, an evaluation of how accurately staff were using the system was undertaken. Over the course of 1 week, all patient triage forms available at the different triage posts were collected for evaluation. An evaluation period of 1 week was deemed sufficient for generating a large enough sample of triage forms. The medical doctor in charge, with no direct involvement in the day-to-day triage activities, collected and checked the forms. Nurses involved in completing the patient triage forms and the local doctor responsible for supervising them were blinded to the evaluation.

The triage forms were checked to determine whether the TEWS and identified discriminator conditions matched the final allocated triage colour. A 15% error rate is accepted in the SATS protocol, and this was thus used as the acceptable error threshold. Levels of under- and over-triage were also assessed and compared to the American College of Surgeons Committee on Trauma (ACSCOT) guidelines which accept threshold indicators for over-triage of up to 50% and up to 10% for under-triage.¹¹

Ethical considerations

Due to the routine nature of the study data, the study was exempted from review by the Pakistani National Bioethics Committee. The study also fulfilled the criteria for analysis of routine data by the MSF Ethics Review Board.

RESULTS

Of 381 triage forms collected for this evaluation, 11 (3%) had triage information missing and were therefore excluded. Table 2 shows the accuracy of completion of the 370 forms evaluated. Overall, 320 (86%) had been completed without errors, resulting in the correct triage priority being assigned (the degree of correctness was highest for patients in the most urgent categories of red and orange). Of the 50 forms completed with errors, only 16 (4%) resulted in the incorrect triage priority being allocated: in 12 (3%) cases the patient was under-triaged and in the remaining 4 (1%) cases the patient was over-triaged.

A basic sensitivity analysis indicated that even if the 11 excluded triage forms had indicated an incorrect triage priority, the overall level of error would still have only been 7%, i.e., well below the accepted threshold of 15%.

DISCUSSION

This is the first time that the implementation of the SATS system for the triage of emergency cases has been studied in a resource-poor setting in Asia. The experience shows that the system is viable and can be implemented accurately in a district hospital in a rural district of Pakistan. Successful implementation of the SATS system in this particular setting was likely facilitated by a number of factors.

First, the tool itself was relatively easy to use. Our findings indicate that nurses were able to use the tool with a high degree of accuracy after just one short 1-hour training session each.

TABLE 2 Accuracy of completion of the SATS forms by staff at Timergara District Hospital, Pakistan (N = 381)*

Allocated triage colour	Accuracy of completion†			Total n (%)
	Correct n (%)	Incorrect but no change in triage colour n (%)	Incorrect and change in triage colour n (%)	
Green	77 (85)	8 (9)	6 (7)	91 (25)
Yellow	105 (81)	17 (13)	8 (6)	130 (35)
Orange	100 (91)	8 (7)	2 (2)	110 (30)
Red	36 (97)	1 (3)	0	37 (10)
Black	2 (100)	0	0	2 (0.5)
All	320 (86)	34 (9)	16 (4)	370 (100)

*11 triage forms had information missing and were therefore not included.

†A 15% error rate is accepted in the SATS protocol; this was thus used as the acceptable error threshold.

SATS = South African Triage Scale.

Second, understanding the decisional and management systems within the MoH and ensuring appropriate collaboration with key players were believed to be integral to the acceptance and implementation of the SATS. Engaging with hospital staff was also deemed important to foster their cooperation. Staff members were made aware of the fact that patients were dying unnecessarily in the ED due to delays in diagnosis and treatment, and the concept of a triage system was presented as a mechanism for better managing patient caseloads and improving patient care. This was intended to enhance ownership and responsibility.

Third, gaining community acceptance was considered important, especially for this very traditional setting, where segregation of the sexes is the cultural norm. By being sensitive to these cultural norms and incorporating them into the way the SATS was implemented, we hoped that the system would be less likely to be met by dissatisfaction from patients and their care givers.

Fourth, by creating open communication channels with key hospital staff and briefing other hospital staff such as security guards and cleaners about the changes, we felt that it would be possible to establish a more effective platform for transformation.

The implementation of the SATS in Timergara's ED did not require significant resources or investment. One of the main requirements was the availability of a staff member able to train other staff in the use of SATS. If capacity to train nurses in the use of the SATS was developed, we believe that the use of this triage tool would be feasible across routine care delivery systems in Pakistan and in other similar settings.

Finally, with triage deemed to be of low priority in the developing world, little research to date has been invested in this method of handling ED patients. Nonetheless, as emergency medicine becomes a more common feature of health care systems in

developing countries, strategies need to be employed to ensure that limited, overstretched resources are used as effectively as possible, and that patient care and outcomes are optimised. Triage is one mechanism that can be used to reach these goals.^{2,3} In conclusion, our experience shows that the SATS can be implemented successfully and used accurately by nurses in an ED in Pakistan.

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A la suite de la mise en œuvre du système d'Echelle de Triage d'Afrique du Sud (SATS) dans le Département des Urgences de l'Hôpital de District Head Quarter (DHQ) à Timergara, Pakistan, 1) nous décrivons ce processus de mise en œuvre et 2) nous signalons dans quelle mesure le système a été utilisé de manière appropriée. Sur les 370 formulaires de triage évalués, 320 (86%) ont été complétés sans

erreur, avec comme conséquence une assignation correcte de la priorité de triage. On a noté des erreurs dans 50 formulaires complétés, mais 16 seulement (4%) ont entraîné l'assignation à une priorité incorrecte de triage. Cette expérience montre que le SATS peut être mis en œuvre avec succès et utilisé de manière précise par les infirmières dans un département des urgences au Pakistan.

Tras la introducción del sistema de una escala de selección (South African Triage Scale [SATS]) en el servicio de urgencias del Hospital Central del Distrito de Timergara en Paquistán, el presente artículo tuvo como objeto 1) describir el mecanismo de ejecución del proyecto y 2) rendir un informe sobre la exactitud con que el personal de urgencias utilizó el sistema. De los 370 formularios de selección analizados, 320 (86%) estaban completados sin equivocaciones, con

lo cual se había asignado una prioridad correcta de atención. En 50 formularios se observaron errores, pero solo 16 de ellos (4%) tuvieron como consecuencia la asignación de una prioridad de selección inadecuada. Esta experiencia pone en evidencia la eficacia de la aplicación del SATS y confirma la precisión de su utilización por parte del personal de enfermería en un servicio de urgencias en Paquistán.