Original Article

Accuracy of Triage by Nurses and Doctors in the Emergency Department

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Background: Triage is an important tool that enables the effective allocation of resources in the emergency department. Although under triage leads to greater complications and over triage leads to the overuse of resources, no study has yet been conducted examining triage accuracy in Srinagarind Hospital.

Objective: To evaluate the accuracy of triage performed by nurses and doctors compared to standard triage using the Emergency Severity Index (ESI).

Materials and Methods: This was a prospective descriptive study that compared triage performed by nurses and doctors with standard triage in 367 patients who presented at Srinagarind Hospital's emergency department from August to October 2017.

Results: Triage performed by nurses was accurate in 258 cases (70.30%), with over triage in 45 cases (12.26%) and under triage in 64 (17.44%). That performed by doctors was accurate in 265 cases (72.21%), with over triage in 52 cases (14.17%) and under triage in 50 (13.62%).

Conclusion: There was no significant difference in the accuracy of triage performed by nurses and doctors.

Keywords: Triage, Emergency Service, Health resources, Nurses, Emergencies

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In-hospital triage is a process that is used to categorize patients by severity of illness or injury in order to properly allocate medical treatment and limited resources in the emergency department (ED). It therefore plays an important role in screening for patients with critical illnesses or injuries in order to facilitate immediate treatment. There are various triage systems employed in different hospitals including the Emergency Severity Index (ESI), Manchester Triage System (MTS), Australasian Triage System (ATS), and Canadian Triage and Acuity Scale (CTAS). A previous study compared the rates of mortality within the first 24 hours and admission in the intensive care unit in patients with high and low CTAS triage scores and found significant relatively[1]. It is critical that triage is as accurate as possible, as studies have found that under triage results in increased complications and mortality[2,3]. Moreover, accuracy may be dependent on the healthcare professional who performs the triage. One study found that nurses tend to triage patients into more urgent levels compared to doctors[4].

In Thailand, the National Institute for Emergency Medicine (NIEM) has established a triage system for emergency patients based on the 2012 ESI Implementation Handbook, in which patients are divided into five levels[5-7]. There are various methods of conducting triage audits, such as reviewing past medical records and comparing triage with final diagnosis at the end of treatment[8-13]. However, there have yet been no studies regarding triage accuracy in Srinagarind Hospital. Thus, the present study was conducted to evaluate the accuracy of triage by nurses in the Srinagarind Hospital ED.

Materials and Methods

This was a prospective descriptive study. The sample consisted of 367 patients who presented at the Srinagarind Hospital ED from August to October 2017. Patients who were not triaged by both doctors and nurses at the triage point were excluded. Ethical approval was provided by the Khon Kaen University Ethics Committee for Human Research (HE591181). The sample size was calculated based on the accuracy of triage reported in a previous study by Sittichanbuncha et al[4]. In order to achieve a significance

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level of 5% and power of test of 0.8, the authors determined that a sample size of 367 would be required. Statistical analysis was performed using SPSS for Windows version 16.0 (SPSS Inc., Chicago, IL, USA). Categorical data were presented as percentages, and continuous data were presented using mean and standard deviation. Univariable analysis was performed using a two-sample t-test for numerical data and a Pearson's correlation for data relationship between the two groups.

Results

Three hundred sixty-seven subjects were examined, the characteristics of whom are shown in Table 1. Most of the patients were 16 to 60 years old, and 60.49% (n = 222) were female. Patients mostly presented during the afternoon shift (46.32%), and the mode of arrival was walk-in in 93.73% of cases. The chief complaints were mostly fever (20.71%), abdominal pain (19.35%), and dizziness (8.17%).

As shown in Table 2, triage by nurses was accurate in 258 cases (70.30%), over triage occurred in 45 cases (12.26%), and under triage occurred in 64 cases (17.44%). Triage by doctors was accurate in 265 cases (72.21%), with over triage in 52 cases (14.17%) and under triage in 50 (13.62%).

Logistic regression analysis revealed that triage of female patients, those in the child age group, those who arrived during the night shift, and those who arrived by emergency medical services was more accurate, but not to a statistically significant extent (Table 3).

Table 1. Characteristics of the subjects

	Number (%)
Gender: female	222 (60.49)
Age group	
Child	39 (9.54)
Adult	235 (60.03)
Geriatric	97 (26.43)
Time of visit	
Morning shift	155 (42.23)
Afternoon shift	170 (46.32)
Night shift	42 (11.44)
Mode of arrival	
Walk-in	344 (93.73)
Transfer from other departments	10 (2.72)
Emergency medical services	7 (1.91)
Chief complaints	
Fever	76 (20.71)
Abdominal pain	71 (19.35)
Dizziness	30 (8.17)
Dyspnea	23 (6.27)
Diarrhea	13 (3.54)
Chest discomfort	12 (3.27)
Back pain	9 (2.45)
Pain in limbs	9 (2.45)
Seizure	8 (2.18)
Hypertension	6 (1.63)
Headache	6 (1.63)
Cough	6 (1.63)
Others	98 (26.72)

Discussion

The present study found that there was no significant difference in triage accuracy between nurses and doctors, which is in contrast to the results of a previous study, which found that triage by nurses tends to be more accurate than that by doctors[4].

Upon analyzing the data, we found that the rate of under triage was 5%, which is above the acceptable level[14], and may be harmful to patients or delay treatment. Over triage by nurses and doctors was 12.26% and 14.17%, respectively, which was less than 50% of the international standard[14]. From this study to develop additional triage training methods to make better triage. No significant factors affecting triage were found in the analysis of multi-factors that affect triage in this study. This may be due to the small sample size, so further studies should be conducted in larger numbers of patients.

Conclusion

There was no significant difference in the accuracy of triage by nurses and that by doctors.

Table 3. Factors affecting the accuracy of triage

	Odds ratio	95% CI	*p*-value
Gender: female	1.11	0.70 to 1.75	0.650
Age group			
Child	1.01	0.46 to 2.23	0.965
Geriatric	0.86	0.51 to 1.44	0.584
Time of visit			
Afternoon shift	0.90	0.56 to 1.45	0.694
Night shift	1.54	0.68 to 3.49	0.293
Mode of arrival			
Transfer from other departments	0.98	0.24 to 3.87	0.981
Emergency medical services	1.05	0.20 to 5.52	0.951

Table 2. Comparison of triage by nurses and doctors

	Accuracy (%)	Over triage (%)	Under triage (%)	95% CI	*p*-value
By nurse	258 (70.30)	45 (12.26)	64 (17.44)	65.33 to 74.93	
By doctor	265 (72.21)	52 (14.17)	50 (13.62)	67.32 to 76.73	
Total	286 (77.93)	34 (9.26)	47 (12.81)		0.406

What is already known on this topic?

Triage is a process used to categorize patients by illness or injury in order to allocate medical treatment resources properly in the emergency department (ED). There are two types of triage: field triage and in-hospital triage.

What this study adds?

The rate of under triage was higher than the standard.

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Potential conflicts of interest

The authors declare no conflicts of interest.

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ความแม่นยำในการคัดแยกผู้ป่วยของแพทย์และพยาบาลในแผนกฉุกเฉิน

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ภูมิหลัง: การคัดแยกผู้ป่วยเป็นเครื่องมือสำคัญในการจัดสรรทรัพยากรให้มีประสิทธิภาพในแผนกฉุกเฉิน การคัดแยกผู้ป่วยต่ำกว่าเกณฑ์อาจส่งผลแทรกซ้อนต่อผู้ป่วยได้ และการคัดแยกผู้ป่วยสูงกว่าเกณฑ์จะทำให้ใช้ทรัพยากรมากเกินความจำเป็น ซึ่งในส่วนของโรงพยาบาลศรีนครินทร์ยังไม่มีการศึกษาความแม่นยำในการคัดแยก

วัตถุประสงค์: เพื่อประเมินความแม่นยำในการคัดแยกผู้ป่วยของแพทย์และพยาบาลในแผนกฉุกเฉินเทียบกับเกณฑ์มาตรฐาน

วัสดุและวิธีการ: การศึกษาเชิงพรรณนาไปข้างหน้าประเมินความแม่นยำในการคัดแยกผู้ป่วยของแพทย์และพยาบาลในแผนกฉุกเฉินของผู้ป่วย 367 ราย ที่เข้ารับการรักษาในแผนกฉุกเฉินโรงพยาบาลศรีนครินทร์ ระหว่างเดือนสิงหาคม ถึง เดือนตุลาคม พ.ศ. 2560

ผลการศึกษา: ความแม่นยำในการคัดแยกผู้ป่วยของพยาบาลถูกต้อง 258 ราย ร้อยละ 70.30 คัดแยกผู้ป่วยสูงกว่าเกณฑ์ 45 ราย ร้อยละ 12.26 และคัดแยกผู้ป่วยต่ำกว่าเกณฑ์ 64 ราย ร้อยละ 17.44 ในส่วนของความแม่นยำในการคัดแยกผู้ป่วยของแพทย์ถูกต้อง 265 ราย ร้อยละ 72.21 คัดแยกผู้ป่วยสูงกว่าเกณฑ์ 52 ราย ร้อยละ 14.17 และคัดแยกผู้ป่วยต่ำกว่าเกณฑ์ 50 ราย ร้อยละ 13.62

สรุป: ความแม่นยำในการคัดแยกผู้ป่วยของแพทย์และพยาบาลในแผนกฉุกเฉินไม่มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติ