TURKISH JOURNAL OF EMERGENCY MEDICINE

Original Article

Access this article online

Quick Response Code:

Website: www.turkjemergmed.com

DOI: 10.4103/2452-2473.357349

Results of an advanced nursing triage protocol in emergency departments

Songül Biskin Çetin[1], Oktay Eray[2]*, Sengül Erdal Akiner[3], Meral Gözkaya[3], Özlem Yigit[2]

[1]Department of Surgical Nursing, Akdeniz University, Antalya, Turkey, [2]Departments of Emergency Medicine, Faculty of Medicine, Akdeniz University Hospital, Antalya, Turkey, [3]Department of Emergency, Akdeniz University Hospital, Antalya, Turkey

**Corresponding author*

Abstract:

OBJECTIVES: The increasing number of patients admitted to emergency departments (EDs) and overcrowding of EDs lead to a global problem. Advanced nursing triage is an important solution in facilitating patient and time management, also increasing the efficiency of the ED. This study was conducted to predict the possible effects of applying advanced nursing triage modeling with predetermined protocols during the current nursing triage in the ED.

METHODS: This was a descriptive and cross-sectional study. An advanced "triage assessment protocol," which was developed previously, was hypothetically applied for 5 days by triage nurses in the adult ED of a university hospital. The hypothetical application was tested by triage nurses in all shifts. The nurses recorded the examination or treatment options which they thought to apply for the patient on the study form. The data recorded on the advanced triage evaluation protocol form by the triage nurses were compared with the patient outcomes and physician examination/treatment requests in the Hospital Information Management System by the researchers.

RESULTS: In the study, it was determined that the rate of examination/treatment that could be requested according to the advanced nursing triage protocol was 46%. There were a good level of agreement on X-ray and a moderate level of agreement on urinary test and urinary beta- Human chorionic gonadotropin (hCG) test between physicians and triage nurses regarding examination/treatment requests. In addition, it was found that there was a 61.2% of agreement on decisions made for patients aged between 18 and 35. The rate of agreement between doctors and nurses regarding a gluco-stick request for patients admitted outside the prime time (92.2%) was found to be significantly higher (87.9%) than for patients admitted during prime time ($P = 0.046$).

CONCLUSION: "Advanced triage" practices recommended for busy EDs were tested "hypothetically" at the national level due to the lack of legal regulations and were found to be compatible with the actual results of physicians' practices at an acceptable level, especially for selected medical conditions. The method used in this study can be useful in planning the transition to "advanced triage" practices. These results can show the readiness of nurses for the transition to this practice.

Keywords:

Advanced triage, clinical decision-making, emergency departments, emergency nursing

Submitted: 23-02-2022
Revised 1: 27-04-2022
Revised 2: 31-05-2022
Accepted: 01-06-2022
Published: 30-09-2022

ORCID:
SBC: 0000-0003-1174-9124
OE: 0000-0002-1643-6007
SEA: 0000-0002-8501-4342
MG: 0000-0002-5892-5327
ÖY: 0000-0003-3703-7590

Address for correspondence:
Prof. Oktay Eray, Departments of Emergency Medicine, Faculty of Medicine, Akdeniz University Hospital, Antalya, Turkey.
E-mail: oktayemergency@gmail.com

Introduction

In recent years, there has been an increase in the number of patients admitted to the emergency department (ED) all over the world. Increasing patient density can lead to poor clinical outcomes, decreased patient satisfaction, and long stays.[1] As a result, the quality of patient care can decrease, and undesirable events can occur.[2] One of the ways to facilitate patient and time management and improve patient outcomes in ED is advanced nursing triage

How to cite this article: Çetin SB, Eray O, Akiner SE, Gözkaya M, Yigit Ö. Results of an advanced nursing triage protocol in emergency departments. Turk J Emerg Med 2022;22:200-5.

Box-ED

What is already known on the study topic?

- Advanced nursing triage is one of the safe practices to facilitate patient management and increase the efficiency of the emergency department.

What is the conflict on the issue? Has it important for readers?

- There is no legal regulation on advanced nurse triage at the national level
- A pilot study method can be effective in establishing and implementing the legal infrastructure of advanced triage nursing.

How is this study structured?

- This study was conducted as a single-center, descriptive, and cross-sectional study with 842 adult patients' data on advanced nurse triage.

What does this study tell us?

- In line with the protocol determined in this study, it was found that patient specification in selected groups might be done at an acceptable level by triage nurses in accordance with criteria
- In countries where legal regulations regarding advanced nursing triage practices are inadequate, the method applied in this study can be used to determine nurses' adjustment and shortcomings. Preferring applications with higher consistency, especially outside prime times, can provide a safe transition period.

practices.[3,4] It is known that advanced nursing triage practices reduce the average waiting time and length of stay,[2,3,5,6] make bed use more efficient, facilitate medical decision-making, and enable medical diagnoses to be made in a shorter time.[2] It also increases the satisfaction level of patients, nurses, and doctors.[2,5,6]

Advanced triage is a comprehensive process and includes initiating diagnostic tests for eligible patients based on a predefined protocol or algorithm.[6] Advanced nursing triage protocols can be used for patients who do not urgently need a bed and whose main complaint is suitable for the protocol.[2] Advanced triage protocols have been used in EDs for many years. However, it is vital to ensure that this process is approved within the terms set by state laws and statutes.[7] There is no legal regulation on advanced nursing triage at the national level. For this reason, this study was planned to apply advanced nursing triage modeling with predetermined protocols and to predict possible effects during the current nursing triage in the ED. Furthermore, it was aimed to present important findings of the feasibility of advanced nursing triage with this study.

Methods

Study design

This study was conducted in a descriptive and cross-sectional design to test the possible results of advanced nursing triage application in a sample model. This study has been prepared in accordance with the STROBE checklist. Ethical approval was obtained by the Akdeniz University Faculty of Medicine Ethics Committee for Non-Interventional Clinical Research with the approval number of 2012/KAEK/20/325/2020 on the date of May 13, 2020.

Sample and setting

The study was conducted in the adult ED of a university hospital which has approximately 280 patient visits daily and 100,000 annually. The emergency overcrowding score of the department according to National Emergency Department Overcrowding Score (NEDOCS) was calculated to be level 4 (overcrowded). Triage is routinely performed by 18 shiftly working nurses with an ED experience of at least 1 year and who received 6h of triage training. When a patient applied to the triage area, the nurse asked the chief complaint and a brief history of the symptoms (primary complaints, patient's past medical/surgical history, chronic diseases, and other information such as pain scale and Glasgow Coma Scale), checked the vital signs (blood pressure, pulse rate, body temperature, respiratory rate, and oxygen saturation), and then decided the category based on the triage scales. Triage nurses are using the Australasian Triage Scale and Emergency Severity Index Version 4 (ESI) scale routinely. Patient management in ED was carried out by emergency medicine residents under the supervision of an attending physician or faculty of emergency medicine. All diagnostic and treatment modalities done for the patient are recorded to the hospital information management system (HIMS) electronically.

Participants

The study consisted of patients who presented to the adult ED within 5 days, did not require emergency intervention, and needed resources according to the triage nurse's decision. Patients who were presented to ED by ambulance and required emergency intervention and all patients under the age of 18 were excluded from the study.

Study procedures

The triage nurses hypothetically applied the advanced triage evaluation protocol to the consecutive patients who presented to the adult ED and met the inclusion criteria, simultaneously with the routine triage protocol. Advanced triage evaluation protocol was created by a team of specialists based on the literature.[2,8-10] The specialists were two ED professors and two ED nurses with 10 years

of experience. The advanced triage evaluation protocol included implementing X-ray, analgesic pomade, gluco-stick, urinary test, oral paracetamol, urinary beta-Hcg, and local anesthesia of the eye. Table 1 shows in which patient complaints this protocol could be applied.

The admission date and time, patient's, name and surname, chief complaint, triage category, and the code data (A, B, C, and D) in the advanced triage assessment protocol were recorded on the application form of the research protocol. The protocol was applied out of the prime time (the time interval between 00.00 and 17.59, the hours when patient density was known to be moderate to low) and during the prime time (the time interval between 18.00 and 23.59, the hours when patient density was highest). These time intervals were decided according to patient admission data in the hospital information system that was achieved in our ED previously. In addition, the form was filled out both for the patients who were directly admitted to the department and those in the waiting room. The ED advanced nurse triage model was applicated as follows: first, the patient comes to the adult emergency triage area. The triage nurse completes the patient's history and physical assessment. The nurse fills out the application form of the research protocol found in the area for the patient. In this form, the codes in the advanced triage evaluation protocol are written in the code field. The triage nurse determines whether the patient meets one of the criteria determined in the advanced triage protocol by listening to his/her complaint and making an assessment. The nurse records the tests that he/she has determined for the patient on the research protocol application form as coded in the protocol. During this process, the triage nurse does not request any treatment and/or examination for the patient. In the study, a hypothetical treatment and/or examination was chosen among the options in the advanced nursing triage at that moment. Here, a hypothetical description of what examination/treatment would be required for the patient if advanced triage was to be applied was made.

In the study, the tests requested for the patients, demographic data, and the length of the patient's stay in the ED and the waiting room were obtained from the HIMS database. Before starting the study, the researchers informed the triage nurses about how to use the protocol [Table 1] that was developed and how to fill out the application form of the research protocol. The decisions of physicians about patient management and the hypothetical decision of the triage nurses were blind to each other during the study period.

Table 1: Advanced triage evaluation protocol

X-ray	A - Trauma, suspicion for trauma or sprains around knee-elbow, and hand-foot (except open fracture and wound)
Topical analgesic	A - Trauma, suspicion for trauma or sprains around knee-elbow, and hand-foot (except open fracture and wound)
Gluco-stick	A - All diabetics B - Dizziness or syncope
Urinary test	A - Dysuria (Urinary burning, pain) B -Female patients with low pelvic pain
Oral paracetamol	A - All acute pains except stomach and chest pain (low back, head and throat pain, simple traumatic pains) B - Fever above 38°C
Urinary beta-Hcg	A - All female patients in the reproductive age group with abdominal pain B - Patients with symptoms of pregnancy (menstrual delay, nausea, etc.) C - Dizziness or syncope for female patients of reproductive age D - Female patients with suspicion of pregnancy, who will receive radiography
Topical anesthesia of the eye	A - Red eye and pain B - Minor eye trauma and pain C - Foreign body in eye and pain D - Exposure of the eye to chemical substances and pain

Hcg: Human chorionic gonadotropin

Data analysis

Categorical variables were presented as frequency values (n) and percentages (%), and continuous variables as mean ± standard deviation and median (min–max) values. The assumption of normality was tested by using the Shapiro–Wilk test. Pearson Chi-square test and Fisher's exact test were used to analyze the relationships between categorical variables. The agreement between triage nurses and doctors on possible tests to be requested for the patients was evaluated with the kappa test. The degree of agreement based on kappa coefficient was classified as follows: ≤0.20, insignificant; 0.21–0.40, poor; 0.41–0.60, moderate; 0.61–0.80, good; and 0.81–1.00, very good.[11] All analyses were performed on the IBM SPSS 23.0 software package (IBM Corp., Armonk, NY, USA), and $P < 0.05$ was considered statistically significant.

Results

A total of 2817 patients were admitted to the adult ED of the hospital where the study was conducted for 5 days. The study included data on advanced nursing triage obtained from 842 adult patients who met the inclusion criteria.

Of the 842 patients included in the study, 51.8% were female, and 48.2% were male. The mean age of the patients was 38.46 ± 17.28 years. Furthermore, 68.5% of the patients were included in the study out of prime time and 31.5% during prime time. In the study, it was determined that the rate of examination/treatment that could be requested according to the advanced nursing triage protocol was 46%. It was found that the mean length of stay in the ED was 87.48 ± 105.23 min and the length of stay in the waiting room was 17.5 ± 34.48 min [Table 2].

It was found that the rate of tests/treatments likely to be requested by the triage nurse for patients with triage categories 4 and 5 (55.4% and 50.6%) was higher than for patients with triage category 3 (34.4%) ($P < 0.001$). When the distribution of possible tests that might be requested by the nurses was analyzed according to triage categories, it was found that the rate of X-rays in patients with triage category 4 (14.2%) was higher than in those with triage categories 3 and 5. Urine test (8.9%) and gluco-stick ratio (7.5%) were found to be higher in triage 3 group compared to triage 4 and triage 5. The rate of oral paracetamol administration was observed the highest in patients with triage category 5 (43.2%) and the lowest in those with triage category 3 (5%) ($P < 0.001$) [Table 3].

According to the advanced nursing triage evaluation protocol, the rates of agreement between the examinations/treatments that were likely to be requested by the nurses and the examinations/treatments requested/given by the doctors during the examination were compared [Table 4]. The results are presented in Table 4.

Table 2: Demographic data

Variables	Mean±SD	Median (minimum-maximum)
Patient age (year)	38.46±17.28	34 (18-92)
Length of stay in ED (min)	87.48±105.23	58 (2-1360)
Length of stay in the waiting room (min)	17.5±34.48	0 (0-210)
Variables		***n* (%)**
Patient age		
18-35		449 (53.3)
36-64		301 (35.7)
≥65		92 (10.9)
Gender		
Male		406 (48.2)
Female		436 (51.8)
Triage category		
3		360 (42.8)
4		401 (47.6)
5		81 (9.6)
Prime time		
Outside (00:00-17:59)		577 (68.5)
Inside (18:00-23:59)		265 (31.5)
Requesting an examination		
It cannot be requested		455 (54.0)
It can be requested		387 (46.0)
Requesting multiple examinations		
No		739 (87.8)
Yes		103 (12.2)
Possible examinations that can be requested		
X-ray		79 (9.4)
Analgesic pomade		14 (1.7)
Gluco-stick		39 (4.6)
Urinary test		44 (5.2)
Oral paracetamol		145 (17.2)
Urinary beta-Hcg (*n*=436)		28 (6.4)
Local anesthesia of the eye		38 (4.5)

ED: Emergency department, SD: Standard deviation, Hcg: Human chorionic gonadotropin

The rates of agreement between examinations/treatments were compared by the age groups of patients [Table 5]. According to this comparison, it was found that the agreement between the decisions made by doctors and nurses in patients aged 18–35 (61.2%) was higher than the agreement obtained (45.7%) in patients aged 65 and over ($P = 0.009$). The highest rate of agreement with regard to gluco-stick requests was observed in patients aged 18–35 (95.1%) ($P < 0.001$). The rate of agreement between decisions made by doctors and nurses regarding a urinary test request was significantly higher in patients aged 18–35 and 36–64 (92.7% and 95%) than in patients aged 65 and over ($P < 0.001$) [Table 5]. The rates of agreement between examinations/treatments were compared according to the prime time periods of the ED [Table 6]. According to this comparison, it was found that the agreement between the decisions made by doctors and nurses regarding gluco-stick requests in patients admitted outside prime time (92.2%) was higher than in patients admitted outside prime time (87.9%) ($P = 0.046$) [Table 6].

Discussion

In this study, advanced triage nurses used an application that could accelerate the delivery of health services and ensure patient satisfaction in about half of the patients. It was observed that 68.5% of the examination/treatment requests were made out of the prime time in line with the protocol applied by triage nurses. The number of patients admitted to the ED in a time frame is the most important factor affecting the nurse's triage management.[12] We observed that the advanced triage protocol was applied more frequently by nurses at out of prime time in our study. The tendency of triage nurses to participate in the study may have decreased during crowded hours. Some patients may not have been included in the study in crowded prime time intervals. Since this situation was not specialized to any patient group or any symptom, we do not think that this creates bias. Of course, the fact that they did not receive any advanced triage training may have been a factor affecting their choices.

It was found that more than half of the examination/treatment requests determined by the triage nurses over the protocol were compatible with the doctors' examination/treatment requests made during the examination. The X-ray, urinary test, and urinary beta-Hcg requests of triage nurses according to the protocol were consistent with doctors' requests and management. Rosmulder *et al*.[13] found that 93% of

Table 3: Distribution of tests/treatments likely to be requested by the triage nurse by triage categories

	Triage category			*P*
	3	4	5	
Requesting a test, *n* (%)				
No	236 (65.6)	179 (44.6)	40 (49.4)	<0.001
Yes	124 (34.4)	222 (55.4)	41 (50.6)	
Test, *n* (%)				
X-ray	21 (5.8)	57 (14.2)	1 (1.2)	<0.001
Analgesic pomade	1 (0.3)	12 (3)	1 (1.2)	0.013
Gluco-stick	27 (7.5)	12 (3)	0	0.001
Urinary test	32 (8.9)	12 (3)	0	<0.001
Oral paracetamol	18 (5)	92 (22.9)	35 (43.2)	<0.001
Urinary beta-Hcg (*n*=436)	16 (8.1)	11 (5.5)	1 (2.6)	0.334
Local anesthesia of the eye	9 (2.5)	26 (6.5)	3 (3.7)	0.028

Hcg: Human chorionic gonadotropin

Table 4: Agreement between the examinations/ treatments requested by the physician and nurse

The nurse's decision	The physician's decision		Kappa value	*P*
	No, *n* (%)	Yes, *n* (%)		
Requesting an examination				
No	235 (62.2)	220 (47.4)	0.145	<0.001
Yes	143 (37.8)	244 (52.6)		
X-ray				
No	737 (98.5)	26 (27.7)	0.762	<0.001
Yes	11 (1.5)	68 (72.3)		
Analgesic pomade				
No	828 (98.6)	0	0.247	<0.001
Yes	12 (1.4)	2 (100)		
Gluco-stick				
No	742 (97.9)	61 (72.6)	0.332	<0.001
Yes	16 (2.1)	23 (27.4)		
Urinary test				
No	740 (98.9)	58 (61.7)	0.485	<0.001
Yes	8 (1.1)	36 (38.3)		
Oral paracetamol				
No	611 (90)	86 (52.8)	0.389	<0.001
Yes	68 (10)	77 (47.2)		
Urinary beta-Hcg (n=436)				
No	394 (96.3)	14 (51.9)	0.437	<0.001
Yes	15 (3.7)	13 (48.1)		
Local anesthesia of the eye				
No	804 (95.5)	-	-	-
Yes	38 (4.5)	-		

nurses evaluated patients who needed diagnostic testing accurately and completely through advanced triage practices.[13] In another study, it was determined that triage nurses could request appropriate diagnostic tests and start treatment for patients.[8] Stauber[2] stated that the completion of the tests to be used in patient evaluation by advanced triage nurses beforehand enabled early medical decision-making and shortened the treatment period.[2] In our study, we think that advanced triage nursing practices can be started for examination/treatment groups which show good and moderate levels of agreement between nurses and doctors. The results of this study, which was conducted without giving any advanced triage training to nurses, were slightly below the results in the literature. Nevertheless, our study results showed the areas that needed improvement to the future researchers.

In our study, it was found that the rates of examinations/ treatments that were likely to be requested by the triage nurse were higher in patients with triage categories 4 and 5. Robinson[8] found that triage nurses could initiate treatment and request tests for patients with triage category 4 by using a protocol.[8] In our study, the rate of X-ray requests in patients with triage category 4 and the rate of oral paracetamol administration in patients with triage category 5 were found to be high. When triage nurses were compared with doctors in terms of requesting examination/treatment, a good level of agreement was found regarding X-rays requests, while a weak level of agreement was found in terms of administering oral paracetamol. Benger[9] found that, in accordance with the protocol prepared in the ED, specialist nurses determined the radiograph requests for patients with extremity trauma correctly to a great extent.[9] Seguin[10] found that triage nurses could provide safe and effective pain management for patients.[10] Since the physicians or patients preferred intravenous or intramuscular analgesia instead of oral tablets, the level of agreement regarding oral paracetamol administration in our study was found to be low.

In our study, it was found that the rate of consistency between decisions made by triage nurses and doctors about gluco-stick requests and urinary tests in patients aged 18–35 was found to be significantly high. In addition, the agreement between triage nurses and doctors for gluco-stick requests was significantly higher in patients presenting in the time frame out of the prime time. We think that triage nurses do not request gluco-sticks when the ED is crowded. Predicting the tests needed by patients and making requests can increase the overall efficiency of the EDs.[1] We think that the results of our study shed light on the time period and patient age group in which advanced nurse triage practices could be performed, also tests that could be chosen at the triage area.

Limitations

The fact that this research was conducted in a university hospital and hypothetically due to the lack of a legal infrastructure can be considered a limitation. It may be necessary to first determine the shortcomings by conducting a pilot study and providing the necessary education and physical conditions so that the method can be implemented in a very busy ED. Another limitation is the patient's length of stay and loss of

Table 5: The rates of agreement between examinations/treatments requested by doctors and triage nurses by patients' age groups

Examinations	Age			*P*
	18-35, *n* (%)	36-64, *n* (%)	≥65, *n* (%)	
Requesting an examination	275 (61.2)	162 (53.8)	42 (45.7)	0.009
X-ray	423 (94.2)	291 (96.7)	91 (98.9)	0.071
Analgesic pomade	441 (98.2)	298 (99)	91 (98.9)	0.830
Gluco-stick	427 (95.1)	266 (88.4)	72 (78.3)	<0.001
Urinary test	416 (92.7)	286 (95)	74 (80.4)	<0.001
Oral paracetamol	370 (82.4)	236 (78.4)	82 (89.1)	0.057
Urinary beta-Hcg (*n*=436)	206 (91.6)	146 (93.6)	55 (100)	0.078
Local anesthesia of the eye	428 (95.3)	288 (95.7)	88 (95.7)	0.970

Table 6: The rates of agreement between the examinations/treatments requested by the doctor and nurses according to the prime time of the emergency department

Examinations	Prime time		*P*
	Inside (00:00-17:59), *n* (%)	Outside (18:00-23:59), *n* (%)	
Requesting an examination	337 (58.4)	142 (53.6)	0.190
X-ray	555 (96.2)	250 (94.3)	0.224
Analgesic pomade	571 (99)	259 (97.7)	0.209
Gluco-stick	532 (92.2)	233 (87.9)	0.046
Urinary test	532 (92.2)	244 (92.1)	0.950
Oral paracetamol	466 (80.8)	222 (83.8)	0.294
Urinary beta-Hcg (*n*=436)	285 (94.4)	122 (91)	0.198
Local anesthesia of the eye	551 (95.5)	253 (95.5)	0.988

waiting room data in the ED. Although we had these data in the study form, since the study was decided hypothetically, we cannot make any comment and statistical analysis about if this triage system can affect these parameters. In very crowded EDs, it may be reasonable to establish more than two triage areas, to increase the number of triage nurses, and to gain time for examinations.

Conclusion

This study shows that a pilot study method is effective for advanced triage practices in countries that do not have a legal infrastructure for advanced triage nursing. It also indicates that nurses can safely implement an examination- or treatment-accelerating application in almost half of the patients, especially in busy areas where they can spare time. More effective protocols can be developed and legal infrastructure studies can be supported by eliminating the shortcomings identified via these hypothetical measurements.

Acknowledgments
The authors would like to thank the emergency nurses for participating in the study.

Author contribution statement
OE was responsible for the study conception, design, data analysis, and drafting of the manuscript. SBÇ was responsible for the study design and the drafting of the manuscript. ŞE was responsible for the study design and accessed to data. MG accessed to data. OY was responsible for the drafting of the manuscript and supervised the study.

Conflicts of interest
None declared.

Ethical approval
Ethical approval was obtained by the Akdeniz University Faculty of Medicine Ethics Committee for Non-Interventional Clinical Research with the approval number of 2012/KAEK/20/325/2020 on the date of May 13, 2020. In addition, none of the identifying information of the patients was used so that the privacy of patients could be protected.

Consent to participate
A consent form was not obtained from the patients in the study. Because what is tested here is the nurse's decision, not the patient's condition. The management of the patients did not change in any way during the study period. Since only admission data were used, data usage permission was obtained from the hospital. We did not use any patient data, requiring consent in our study.

Financial support and sponsorship
None.

References

1. Zhang X, Kim J, Patzer RE, Pitts SR, Chokshi FH, Schrager JD. Advanced diagnostic imaging utilization during emergency department visits in the United States: A predictive modeling study for emergency department triage. PLoS One 2019;14:e0214905.
2. Stauber MA. Advanced nursing interventions and length of stay in the emergency department. J Emerg Nurs 2013;39:221-5.
3. Jobé J, Ghuysen A, D'Orio V. Advanced nurse triage for emergency department. Rev Med Liege 2018;73:229-36.
4. Moxham L, McMahon-Parkes K. An evaluation of the impact of advanced nurse practitioner triage and clinical intervention for medically expected patients referred to an acute National Health Service hospital. J Clin Nurs 2020;29:3679-86.
5. Svirsky I, Stoneking LR, Grall K, Berkman M, Stolz U, Shirazi F. Resident-initiated advanced triage effect on emergency department patient flow. J Emerg Med 2013;45:746-51.
6. Cheung WW, Heeney L, Pound JL. An advance triage system. Accid Emerg Nurs 2002;10:10-6.
7. Domagala SE, Vets J. Emergency nursing triage: Keeping it safe. J Emerg Nurs 2015;41:313-6.
8. Robinson DJ. An integrative review: Triage protocols and the effect on ED length of stay. J Emerg Nurs 2013;39:398-408.
9. Benger JR. Can nurses working in remote units accurately request and interpret radiographs? Emerg Med J 2002;19:68-70.
10. Seguin DA. A nurse-initiated pain management advanced triage protocol for ED patients with an extremity injury at a level I trauma center. J Emerg Nurs 2004;30:330–5.
11. Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics 1977;33:159-74.
12. Dadashzadeh A, Abdolahzadeh F, Rahmani A, Ghojazadeh MM. Factors affecting triage decision-making from the viewpoints of emergency department staff in Tabriz hospitals. IJCCN 2014;6:269-76.
13. Rosmulder RW, Krabbendam JJ, Kerkhoff AH, Schinkel ER, Beenen LF, Luitse JS. 'Advanced triage' improves patient flow in the emergency department without affecting the quality of care. Ned Tijdschr Geneeskd 2010;154:A1109.