Knowledge and Skills of the Medical and Nursing Staff of Emergency Department in Triage Comparative Study between Public and Private Hospitals in Athens

Helen Gkamprielle Voutsinou RN MSc*[1,2], Konstantinos Ekmektzoglou DR MSca[3], Georgios Gkiokas DR MSca[4], Nikolleta Iakovidou DR, MSca[5]

1 Master's Program "Resuscitation", School of Medicine, National and Kapodistrian University of Athens

2 General Hospital of Athens "Georgios Gennimatas"-Emergency Department

3 Medical School of European University of Cyprus

4 Medical School of Athens, National and Kapodistrian University of Athens

5 Medical School of Athens-Neonatology Clinic of Aretaieio Hospital

*Corresponding author:
Helen Gkamprielle Voutsinou RN

✉ eleni25v@gmail.com

Tel: 6986641048

Master's Program "Resuscitation", School of Medicine, National and Kapodistrian University of Athens

Abstract

Introduction: The triage process, carried out in the Emergency Department (ED), is the basic tool for determining the severity of each patient that comes to it. Its implementation is aimed at redistributing resources, reducing waiting time, as well as reducing import rates. For this reason, the acquisition of the knowledge and skills of the health personnel of the EDs in triage and their utilization is considered a necessary condition.

Purpose: The purpose of this study is to investigate the knowledge and skills of the medical and nursing staff of EDs in triage in public and private hospitals of Athens.

Materials and Methods: This is an analytical cross-sectional study conducted in 6 tertiary hospitals (3 public and 3 private) of Athens during the period October 2021 - March 2022. The sample of the study was the medical and nursing staff of the ED of each participating hospital. The data collection was carried out with a specially designed self-completed questionnaire.

Results: Of the 147 participants, 87 (59.2%) worked in a public hospital and 60 (40.8%) in a private hospital; 64 (43.5%) were physicians and 83 (56, 5%) were nurses/nursing assistants. Of the total study participants, only 46 (31.3%) had attended a seminar in triage, while the majority (98.6%) indicated that the training of medical and nursing staff of EDs on triage should be mandatory. The level of knowledge and skills proved to be moderate in both health service providers. In addition, in terms of triage knowledge, educational level (p=0.001) and years of service (p=0.009) appeared to have an impact, with public sector participants having a relatively higher percentage than private sector participants (0.003). Finally, the triage process is not carried out as much as it should be by law, and the most common model used seems to be that of traffic settlement (20.5%). Most EDs do not use a triage scale, while in EDs that have a triage scale, the most frequently used is the Emergency Severity Index (ESI) (12, 6%).

Conclusions: After analysing the results of the research, it is found that the level of knowledge and skills of the medical and nursing ED staff public and private hospitals is insufficient, as far as the triage process is concerned. It is considered necessary to institutionalize it, as well as additional training in Emergency Medicine and Nursing with the aim of improving the care services provided in our country's E.Ds

Keywords: Emergency department; Triage; Knowledge, Medical and nursing Staff; Emergency medicine; Patient satisfaction

Introduction

The main gate for patients to Primary Health Care (PHC) is the Emergency Department (ED). Their orderly operation in our country seems to be affected by many factors such as the economic crisis, the continuous aging of the population, the inadequacy of the PHC structures and the organization of the ED with the lack of triage systems [1-3]. The combination of these contributes to the exacerbation of "overcrowding effect", resulting in the reduction of the quality of care provided and the

excess of available resources (material and human) [4, 5].

The ED is the one that, with the appropriate infrastructure and the necessary organization and administration, provides high-level Emergency Medical and Nursing Care to citizens who manifest the need for urgent treatment [6, 7] Its operational mission includes reception, resuscitation, diagnosis and treatment of patients with undifferentiated acute and urgent problems, covering the full range of diseases, injuries and behavioural disorders as well as their management until the moment of discharge or the assumption of further care by another physician [8]. A touchstone is the early identification of patients in an acute condition and their direction to the appropriate care area of the ED, aiming at the effective provision of emergency care and the optimal allocation of resources to all of the department's cases [9]. A key tool for this purpose is the adoption of procedures for Categorization-Selection of incidents.

The triage process determines the priority among patients who come for examination at the ED. It is important to mention that the order of priority is not only determined based on specific data (age, gender, etc.), but based on this, incidents are effectively dealt with in cases where the available resources are insufficient [10]. More specifically, the term triage refers to a evaluative process of classifying patients, through various scales, according to the severity of symptoms and available resources, so that the corresponding priority is given [11]. Therefore, through triage, the criticality of the patient's condition, the distribution of the resources of the ED but also of the rest of the hospital departments (allocation of beds in the ED and the clinics), the initiation of interventions and the management of events and the flow of services are investigated [12]. As therefore, the theoretical training and clinical practice of ED health professionals in the triage of patients is considered a necessary condition for the achievement of all that was mentioned.

Looking in the international literature for data on the level of knowledge and skills in triage, the existence of an unsatisfactory level of the medical and nursing staff of the EDs can be distinguished [13-19]. The objectives of this study are to investigate the level of triage knowledge and skills possessed by Emergency Medicine and Nursing health professionals, the correlation between triage knowledge, education, work experience and triage ability and finally to compare the data between public and private hospitals.

Material and Methodology

Design-study Population

This cross-sectional study was conducted in the city of Athens in 6 hospitals [3] public (Athens General Hospital "Evangelismos", Athens General Hospital "G. Gennimatas", Army Equity Fund Nursing Foundation) and 3 privates (Metropolitan, Athens Isoclinic, Athens Medical-Psychiko Clinic). The data was collected over a period of six months from October 2021 to March 2022 among health professionals (medical and nursing staff) of the E.Ds.

The questionnaire included 4 parts. The first part referred to demographic and occupational characteristics. The second part involved training on screening. The third part was related to

the knowledge on sorting while the fourth was on the skills on it. The 3rd and 4th parts were respectively adapted by Duko et al., and Fathoni et al., after written approval and translated into Greek, according to the procedure recommended by the "Trust Scientific Advisory Committee" (SAC) (double reverse translation, cultural adaptation, questionnaire weighting) [20,21].

Ethics

The study questionnaire was distributed to the members of the target population by the researcher himself during working hours, after the approval of the Scientific Council of each participating hospital, without disturbing the orderly operation of the department without any financial burden on the hospital units. The medical and nursing staff of the TEPs were informed about the purpose of the study, how to complete the questionnaire and the voluntary nature of the research orally and in writing. Also, the researcher remained for at least one hour in the area where the questionnaires were distributed, so that any questions regarding filling in the questionnaires or personal data protection issues could be answered. After a week, the researcher returned to the hospitals' EDs to collect the questionnaires. The questionnaires were returned in a closed opaque envelope to achieve maximum anonymity.

The healthcare personnel were assured that the data would be used exclusively for the purpose of the present research and would not have any negative impact on them or their employer. The completion and return of the questionnaire constituted the acceptance of the research participants. Finally, all the principles governing the laws and rules of the research activity were observed.

Statistical analysis

Data normality was tested with the Kolmogorov-Smirnov and Shapiro-Wilk tests as well as kurtosis and skewness. The qualitative variables were described using absolute (n) and relative frequencies (%). For quantitative variables, mean (MO), standard deviation (SD), median (Δ) and interquartile range were used.

In detail regarding the statistical methods used, the Cronbach's alpha coefficient was used to check the internal reliability. To investigate the differences of the means between various characteristics, the t-test was used, and the assumption of equal variances (Levene's test) was checked when normality was valid, while in other cases the Mann-Whitney U test was applied. For variables with more than three levels such as work experience either the parametric analysis of variance (ANOVA) or the non-parametric Kruskal-Wallis H test was applied.

Data were entered and analyzed in the statistical application program SPSS version 25 (IBM Statistical Package for Social Sciences for Windows, Version 25.0. Armonk, NY: IBM Corp). In all analyses, the level of statistical significance was set at 5%.

Results

Socio-demographic & professional characteristics

The sample of the study was the medical and nursing staff of

the ED of the participating hospitals. More specifically, 147 participants finally completed the questionnaire, of which 87 (59.2%) worked in a public hospital and 60 (40.8%) in a private hospital. Of all respondents, 64.6% were women, 53.1% were between 30-50 years of age and the majority (44.9%) had a basic tertiary qualification. Regarding occupational characteristics, 43.5% were physicians and 56.5% were nurses, and 62.6% of respondents reported <5 years of work experience in ED (**Table 1**).

Triage training

The most prevalent additional training in Emergency Medicine and Nursing with certification was found to be training in Basic Life Support (BLS) and the use of an Automated External Defibrillator (AED) (44.5%) (**Table 2**).

Regarding the subjective self-assessment of triage knowledge, 49.6% answered from 5 to 7, 36.0% over 8 while 14.4% up to 5. 55.8% stated that they perform screening at his workplace as well as 86.4% stated that the screening process is carried out by other staff at his place of work. Despite the implementation of the screening process, 26.8% did not know the screening system model and subsequently, 52.8% did not know the exact screening

Table 2. Additional certified training in Emergency Medicine and Nursing.

Additional training in Emergency Medicine and Nursing with certification	Percentage (%)
BLS/AED (Basic Life Support/Automatic External Defibrillator)	44,5
ILS (Immediate Life Support)	12,7
ALS (Advanced Life Support)	10
ACLS (Advanced Cardiac Life Support)	5
ATLS (Advanced Trauma Life Support)	16,8
ATCN (Advanced Trauma Care Nursing)	3,2
TOC (Triage Officer Course)	0,9
PLS (Pediatric Life Support)	1,8
ECG (Electrocardiogram)	4,1

scale used. It is worth mentioning that the next highest response rates regarding the system model and triage scale were: 20.5% for the traffic arrangement model and 12.6% for the Emergency Severity Index (ESI) scale.

Knowledge of triage

Table 3 shows the distribution of the participants' responses to the triage knowledge questionnaire. The questions with the highest percentage of correct answers were: "Is triage a term for classifying patients based on injury-disease priority?" (98.6%), "Can waiting time delays negatively affect patient outcome?" (95.9%) and "Is the purpose of triage to avoid as much as possible the deterioration-death of patients during their wait in the ED?" (89.8%). On the other hand, the question with the lowest percentage of correct answers was: "Does the practice of triage begin with taking the patient's vital signs?" (38.8%). Also, in question 11, which related to the classification of actions during the application of triage, only 4.9% of the participants correctly classified the actions (**Table 3**).

As shown in Table 4 the mean ± standard deviation objective knowledge score at screening was 7.88 ± 1.45, with the total knowledge questionnaire score ranging from 3 to 11 (the maximum possible score) (**Table 4**).

Triage skills

The categorization of the skills score was as follows: 22

- =<60% low triage level

- 60.01% - 80% average triage level

- >=80.01% high level of triage

In all categories the majority had a moderate level of triage while in the rapid assessment 46.3% had a high level of triage (**Tables 5 and 6**).

Correlations

Between the public and private sectors, a higher overall knowledge score was found for public versus private staff (p=0.002). Also, in terms of post-education, workers with master's or doctorate degrees scored higher in triage skills (p=0.001) than either their technology or high school graduates' counterparts. Professional status revealed that physicians had a higher score (p=0.009) in

Table 1. Descriptive analysis of demographic characteristics.

	n	%
Gender		
Female	95	64,6
Male	52	35,4
Age Group		
19-30	57	38,8
30 – 50	78	53,1
50 – 75	12	8,2
Marital Status		
Married	45	30,8
Non married	95	65,1
Divorced	6	4,1
Level of Education		
Diploma	19	12,9
Bachelor	66	44,9
MSc	51	34,7
PhD	11	7,5
Employment institution		
Public Hospital	87	59,2
Private Hospital	60	40,8
Job Title		
Doctor	64	43,5
Nurse	83	56,5
Years of Experience		
< 5	56	38,1
5 – 10	45	30,6
> 10	46	31,3
Years of Experience in Emergency unit		
< 5	92	62,6
5 – 10	36	24,5
> 10	19	12,9

The values refer to absolute (n) and relative frequencies (%).

Table 3. Knowledge of participants in triage.

	n (%)		n (%) respondents with a correct answer
	Right	**Mistake**	
Triage is a condition for classifying patients based on injury-disease priority;	145 (98,6%)	2 (1,4%)	145 (98,6%)
The purpose of triage is to avoid as much as possible the aggravation-death of patients while waiting at the TEP;	132 (89,8%)	15 (10,2%)	132 (89,8%)
Is TEWS an abbreviation for Triage Early Warning Signs?	117 (79,6%)	30 (20,4%)	117 (79,6%)
The 4 worsening severity levels of the AVPU neurological assessment scale are reported: A=Alert, V=Response to Verbal, P=Response to Pain and U=Unconscious;	119 (81,0%)	28 (19,0%)	119 (81,0%)
Triage is difficult and expensive to implement in other healthcare settings;	34 (23,1%)	113 (76,9%)	113 (76,9%)
Triage should only be practiced by professional nurses?	45 (30,6%)	102 (69,4%)	102 (69,4%)
The practical-application of triage-triage begins with taking the patient's vital signs;	90 (61,2%)	57 (38,8%)	57 (38,8%)
Can a patient with a color code Red (RED) wait longer in the waiting area than a patient color-coded Green (GREEN)?	18 (12,2%)	129 (87,8%)	129 (87,8%)
Shouldn't waiting times be considered when it comes to providing emergency care?	50 (34,0%)	97 (66,0%)	97 (66,0%)
Can delays in waiting time negatively affect the outcome of the disease in the patient?	141 (95,9%)	6 (4,1%)	141 (95,9%)
Correct sorting classification	7 (4,9%)	136 (95,1%)	7 (4,9%)
The values refer to absolute (n) and relative frequencies (%).			

Table 4. Descriptive analysis of knowledge score.

Scale	MO	THE	D	E	M
Overall knowledge score	7,88	1,45	8,00	3	11
Overall knowledge score in percentage	71,74	13,21	72,73	27	100
The values refer to an average (MO), standard deviation (TA), median (D), minimum value (E), maximum value (M).					

Table 5. Descriptive analysis of the triage score of knowledge and skills.

Scale	AVG.	T. A	D	E	M
Overall, Knowledge Score	7,88	1,45	8,00	3	11
Overall, Knowledge Score %	71,74	13,21	72,73	27	100
Overall Skills Score	76,35	15,71	76,00	8	100
Rapid Patient Assessment	78,64	16,15	77,00	15	100
Patient Categorization	72,96	19,36	75,00	0	100
Patient Allocation	77,44	17,75	75,00	8	100
The values refer to average (MO), standard deviation (TA), median (D), minimum value (E), maximum value (M).					

Table 6. Descriptive analysis and internal reliability index of skill score scales.

Scale	MO	THE	D	E	M	Cronbach's a
Overall Skills Score	76,35	15,71	76,00	8	100	0,971
Skills Score in rapid patient assessment	78,64	16,15	77,00	15	100	0,966
Skills Score in the categorization of patients	72,96	19,36	75,00	0	100	0,904
Skills Score in patient allocation	77,44	17,75	75,00	8	100	0,951
The values refer to average (MO), standard deviation (TA), median (D), minimum value (E), maximum value (M) and internal relevance index Cronbach's alpha.						

triage skills and rapid assessment of patients (p=0.012) than nurses.

Work experience in ED between 5-10 years appeared to have an impact on triage skill level [total skill score (p=0.009), patient categorization skill score (p=0.037) and allocation skill score of patients (p=0.031)]. Additional triage seminar training had higher scores on both knowledge (p=0.046) and triage skills (p=0.047) than peers who had not attended. Additional training in Emergency Medicine and Nursing did not reveal any statistically significant difference (Total Knowledge Score p=0.104 & Total Skills Score p=0.145) (**Table 7**).

Table 7. Descriptive analysis of variables influencing skills score.

Variable	M.O-T. A	p
Holder of Master's-PhD	83,33 (17,31)	<0,001
Work experience 5-10 years	78,81 (13,61)	0,009
Work experience >10 years	78,81 (17,33)	0,009
Seminar on triage	80,29 (~13,04)	0,047
Professional status (Doctors)	80,51 (14,53)	0,009
The values refer to an average (M.O.), standard deviation (T.A.) and a corresponding p-value.		

Discussion

The purpose of this research was to investigate the level of knowledge and skills of the medical and nursing staff working in the ED, in the triage process. In addition, a comparison of the data between Greek public and private hospitals was carried out. And this is because triage is an essential process resulting in the reduction of waiting time and ensuring that all patients who visit any ED (Public-Private Hospital) receive the appropriate and necessary treatment.

This study revealed that the level of screening knowledge in both health care providers (public-private) was moderate with the public hospital marginally superior to the private (p=0.002). Little difference is found in the findings of corresponding studies with the main result being the low to moderate level of knowledge mainly of nurses [22-24]. In this research, there is no statistically significant difference in the level of knowledge between doctor-nurses. A significant positive correlation was found between years of service and attending a triage seminar (p:0.0046) [17, 19,25-29]. Of course, it is worth noting that some of these studies refer to developing countries and their goal lies in the development of the specialty of Emergency Medicine and Nursing as well as the inclusion of the triage process in their hospitals.

Regarding the skill level in triage, it was found to be at a moderate level. This may be because the medical and nursing staffs of the EDs were more experienced and 55.8% of them reported performing triage. This is like an earlier study that reported that emergency nurses who had at least one year of experience in EDs had satisfactory triage skills [30]. However, participants had little or no training in emergency care especially triage training (31.3% only) which may result from the moderate skill level. In addition, all skills related to advanced nursing skill were not high such as: "Decision to open the airway and remove a foreign body when it is obstructed, according to airway management protocols" (20.4%), " Maintaining airway patency by lifting the chin (chin lift) and placing the head in an appropriate position" (19%), "Listening to breathing noises and distinguishing them, such as wheezing, creaking and wet snoring" (19.7%). the "Listening to silent or noisy breathing and distinguishing them" (24.5%) and the "Assessment of internal and external bleeding" (25.2%). These skills are mainly performed by medical rather than nursing staff.

Furthermore, of the existing training courses, 78.2% of the sample had attended BLS-Basic Life Support rather than specialized emergency response courses. At the same time, a significant positive correlation is shown between years of screening experience and additional education with patient screening skill score (increase) (Table 3).

At this point should be added the fact that in the overall skill score, the participants who answered that the model used in their workplace is traffic management (M.O. ± T.A. = 82.50 ± 3, 23) had a higher score compared to his colleagues who answered that they do not know the model used (M.O. ± T.A. = 71.16 ± 14.73). These findings are in accordance with those of similar studies conducted in other countries with a sample of nursing staff.22,23,28 In general, it appears that experience, such as years of screening experience, additional training, and knowledge contribute to increased screening skills overall relative to participants who did not have the above.

Finally, the system model and triage scale, where in Greece they are more widespread and often used [31]. are that of traffic management and the Emergency Severity Index (ESI) respectively. A fairly large percentage of participants reported that triage is carried out in the ED where they worked, but mainly by nursing staff. The model of traffic management (20.5) and "Don't know" (26.8) were the answers with the highest percentages, which means that triage of cases is not done in a correct and scientifically based way using a specific triage scale. Regarding the screening scale, the Emergency Severity Index (ESI) had the highest frequency of responses while the other scales were consolidated with the response "other".

Limitations of the study

A series of limitations concern this study and for this reason it is a great possibility that the results cannot be generalized to all the staff of the EDs of Athens and the country in general. Specifically, due to the SARS-CoV-2-19 pandemic, there was a delay in the approval for the distribution of the questionnaires, as well as their completion due to the demanding workload of the EDs of each participating hospital. The initial number of questionnaires was 250, with a final sample of 147. The largest percentage of respondents was nurses and despite the difficult conditions and shifts due to Covid, they showed more enthusiasm and willingness. Also, in the private sector, the staffs of the EDs was quite reduced since, due to the pandemic, a large amount of health professionals were moved with various types of contracts to the public sector. Also, few similar studies from Greece were found in the literature, but without a comparison between public and private hospitals, with the result that it is not possible to compare the results and discuss them for the Greek data. Finally, regarding the questionnaire used for case screening skills (TSQ), despite its high degree of validity and reliability, it is a self-assessment questionnaire, where participants subjectively assess their skills, which carries the risk of having higher than actual scores.

Conclusions

The findings provide a better understanding of the level of triage knowledge and skills in the emergency department in the Greek territory, where it was found to be moderate. In addition, there was a significantly positive correlation between screening knowledge and skills, educational experience, and work experience. This could serve as a basis for the development of in-service education and training programs that would emphasize specific screening knowledge to improve the best skills. In any case, the use of triage and the application of its scales should be adopted by Greek hospitals (public and private) to increase the efficiency and effectiveness of the EDs, through the improvement of the quality of the health services provided, the satisfaction of the patients, but and cost reduction.

References

1   World Health Organization (2017) Re-profiling emergency medical services in Greece: Assessment report. WHO, Copenhagen.

2   Mantis P, Tselepi X (2020) Social and cultural factors in the reception and experience of the disease. In (Eds.) Sociological and psychological approach to hospitals/health services. Hellenic Open University Patras.

3   American College of Emergency Physicians. (2006) Crowding.

4   Malliarou M, Sarafis P, Zyga S (2009) Quality of care in the Emergency Department. The Step of Asclepius 8: 25-40.

5   Derlet RW, Richard Jr (2000) Overcrowding in the nation's emergency department: complex causes and disturbing effects. Annals Emerg Med 35: 63-68.

6   Labrou Gp (2005) Emergency Department: Organization and operation. Med force Publications, Athens.

7   Rehman SA, Ali PA (2015) A review of factors affecting patient satisfaction with nurse led triage in emergency departments. Int Emerg Nurs. S1755-599X: 00127-00135.

8   European Society for Emergency Medicine (EU-SEM) (2009) Policy statement on Emergency Medicine in Europe.

9   Charalambous G (2019) Contemporary challenges in Emergency Health Care. Cyprus Nursing Chronicles 18: 6-7.

10 Iserson K, Moskop J (2007) Triage in Medicine Part I: Concept, History, and Types. Annals Emer Med 49: 275-281.

11 Zervea E, Apostolakis I, Sarafis P (2019) Effect of Hospital Triage Systems and Information Systems on the operation of Emergency Departments. Scientific Chronicles 24: 540-555.

12 Intas G, Stergiannis P, Chalari E (2013) Patient Screening Scales in the Emergency Department: A Bibliographic Review. Nursing 52: 1-8.

13 Kelly AM, Richardson D (2001) Training for the role of triage in Australasia. Emerg Med 13: 230-235.

14 Considine J, Levasseur S, Villanuev Ae (2004) The Australasian Triage Scale: Examining emergency department nurses' performance using computer and paper scenarios. Ann Emerg Med 44: 516-523.

15 Varndell W, Hodge A, Fry M (2019) Triage in Australian emergency departments: Results of a New South Wales survey. Australas Emerg Care 22: 81-86.

16 Rahmani F, Majd Ps, Bakhtavar He, Rahmani F (2018) Evaluating the accuracy of emergency nurses in correct triage using emergency severity index triage in Sina hospital of Tabriz: A cross sectional analysis. J Emerg Prac Trauma 4:9-13.

17 Javadi S, Salimi T, Sareban M, Dehghani M (2016) Knowledge and practice of nurses regarding patients' triage in emergency department. Iranian J Emerg Med 3:15-22.

18 Jordi K, Grossmann F, Gaddis Gm, Cignacco E, Denhaerynck K etal. (2015) Nurses' accuracy and self-perceived ability using the Emergency Severity Index triage tool: A cross sectional study in four Swiss hospitals. Scand J Trauma Resusc Emerg Med 23:62.

19 Olofsson P, Gellerstedt M, Carlström Ed (2009) Manchester Triage in Sweden-interrater reliability and accuracy. Int Emerg Nurs 17: 143-148.

20 Trust Scientific Advisory Committee (1998) Bulletin: Overview and update. SAC.

21 Duko B, Geja E, Oltaye Z, Belayneh F, Kedir A et al. (2019) Triage knowledge and skills among nurses in emergency units of Specialized Hospital in Hawassa, Ethiopia: cross sectional study 12: 21.

22 Mukhamad Fathoni, Hathairat Sangchan, Praneed Songwathana (2013) Relationships between Triage Knowledge, Training, Working Experiences and Triage Skills among Emergency Nurses in East Java, Indonesia. Nurse Med J Nur 3: 511-525.

23 Pontisidis G, Platis C, Galanis P, Polyzos N, Bellali T (2021) Knowledge and skills of Greek health professionals regarding triage in emergency departments. Arch Hellenic Med 38: 497-507.

24 Grandson K, Ehrenberg A, Marklund B, Ehnfors M (2005) Accuracy and concordance of nurses in emergency department triage. Scand J Caring Sci 19: 432-438.

25 Mirhaghi Ah, Roudbari M (2011) a survey on knowledge level of the nurses about hospital triage. Iranian J Crit Care Nurs 4: 165-170.

26 ALOYCE R, LESHABARI S, BRYSIEWICZ P (2014) Assessment of knowledge and skills of triage among nurses working in the emergency centers in Dar es Salaam, Tanzania. Afr J Emerg Med 4:14-18.

27 KERIE S, TILAHUN A, MANDESH A (2018) Triage skill and associated factors among emergency nurses in Addis Ababa, Ethiopia 2017:A cross-sectional study. BMC Res Notes 11:658.

28 ALI S, TAVERNER BCB, GHANI M, KUSSOR Z, NAZ S (2013) Knowledge of triage among nurses in emergency units. Bio medica 29: 240-242.

29 Chung JYM (2005) an exploration of accident and emergency nurse experiences of triage decision making in Hong Kong. Accident and Emergency Nursing 13: 206-213.

30 McNAIR RS, SOLHEIM J (2016) The emergency nurse in the role of triage. In: Solheim J (ed) Emergency nursing: The profession, the pathway, the practice. 1st ed. Sigma Theta Tau International, Indianapolis.

31 GILBOY N, TANABE P, TRAVERS DA, ROSENAU AM, EITEL DR (2011) Emergency Severity Index (ESI): A triage tool for emergency department care Version 4: Implementation handbook. Agency for Healthcare Research and Quality, AHRQ Publication 12-0014.