National Journal of Advanced Research
www.allnationaljournal.com
ISSN: 2455-216X
Received: 15-05-2021, Accepted: 30-05-2021, Published: 15-06-2021
Volume 7, Issue 2, 2021, Page No. 09-13

Effectiveness of educational program on nurses' knowledge, attitudes and practices regarding triage in emergency department in Omdurman military hospital

Maza Badawi Abubaker Atigo[1], Magda Elhadi Ahmed Yousif[2]
[1] MSC in Community Health Nursing University Gezira, Sudan
[2] Professor of Community Medicine, Director of Primary Health Care and Health Center, Faculty of Medicine, University of Gezira, Sudan

Abstract
Context: Nurses are the primary officials of triage in emergency departments. Triage nurse should have the proper education and proficiency in emergency triage, decision making, and emergency nursing care. Training on triage is an integral part of emergency nursing education. Poor performance and lack of education are well documented in the literature.
Aim: This study aimed at evaluating the effect of triage education on emergency nurses‘ performance in diverse emergency departments.
Methods: Quasi-experimental (pre, post-test design) used to achieve the aim of this study. A purposive sample of one hundred fifty emergency nurses worked at pediatric, Obstetric, and adult emergency departments affiliated to Omdurman Military Hospital. Assessment of the nurses‘ knowledge, practice, and attitude have been done using a self-administered questionnaire, triage competencies observational checklist, and nurses‘ attitude measuring scale.
Results: The study revealed poor nurses‘ triage knowledge, practice, and negative attitude for the studied nurses before triage education, compared to a significant improvement after triage educational program, with a statistically significant difference among the three- implementation phases (pre, post, and one month follow up).
Conclusion: The nurses who are subjected to triage education improved in their knowledge, practice and attitude at the post-intervention evaluation compared to their pre-intervention level, which sustained after one month follow up. These findings support the study hypotheses. Based on these findings, the study recommended the publication and dissemination of the triage educational program. Besides, fostering and sustaining the improvements in practices regarding triage in ED through the orientation of new nurses, on the job training, and continuous education.

Keywords: effectiveness, educational program, knowledge, attitudes, practices, triage, nurse, Omdurman military hospital

Introduction

Triage is the process of determining the priority of patients' treatments based on the severity of their condition. This rations patient treatment efficiently when resources are insufficient for all to be treated immediately. The term comes from the French verb trier, meaning to separate, sift or select. Triage may result in determining the order and priority of emergency treatment, the order and priority of emergency transport, or the transport destination for the patient (Iserson and Moskop.2017).

Triage may also be used for patients arriving at the emergency department, or telephoning medical advice systems, among others (Gilboy *et al*., 2012) [11].

The emergency department is the crucial interface between the emergency medical services and the hospital. As reflected in the year-on-year increases in patient numbers, however, emergency departments are increasingly being selected as the route of primary access to the healthcare system (Pitts *et al*., 2018) [24]. Deficits in preclinical patient guidance have been put forward as a possible explanation for this trend (Steffen *et al*., 2017) [29].

The volume of admissions to a given emergency department cannot be predicted with any great accuracy, only a certain proportion of the patients have life-endangering or medically urgent conditions (Schellein *et al*., 2018) [28], and not all those admitted can be treated immediately or simultaneously. Thus, patients with life-threatening injuries or illnesses. need to be reliably identified within minutes of arrival (Rutschmann *et al*., 2019) [27]. Structured triage systems for emergency department admissions are already in use in the German-speaking countries and the relevant medical societies are calling for their introduction in nations with established hospital emergency services (Rutschmann *et al*., 2019, Fernandes *et al*.,2015) [27, 10].

In the emergency department ―triage‖ refers to the methods used to assess patients‘ severity of injury or illness within a short time after their arrival, assign priorities, and transfer each patient to the appropriate place for treatment (Fernandes *et al*., 2015) [10]. In our view the term ―triage‖ should be adopted in German-speaking countries in preference to the various German words that have been used, e.g., ―*Sichtung*‖ and ―*Ersteinschätzung*, ‖ as the latter are not clearly defined concepts. In some European countries, among them Germany and Switzerland, triage is performed by specially trained nursing staff. The aim of this study is to provide a systematic overview of established instruments for triage in the emergency department and evaluate their validity and reliability (Grossmann *et al*., 2009).

In Sudan system is structured with a primary triage area for sorting patients into emergent and non-emergent cases. The first group is then triaged into one of three sectors:

resuscitation area, critical care area, and an area for less severe cases. All traumatic patients are triaged immediately to the trauma room. But the non-emergent cases are assessed in a separate area as ‗cold cases (Elbashir and Elfaki, 2017) [7].

Methodology

A hospital-based study, and a quasi-experimental (pre, post and follow up) design used in order to achieve the aim of the study. This design used to compare participant groups and measure the degree of change occurring as a result of treatments or interventions.

The study conducted at Omdurman Military Hospital at different sorts of emergency departments mainly including pediatric, obstetric, and adult emergency departments.

A purposive sample consisting of 150 nurses recruited to achieve the aim of this study. They are selected from pediatric, obstetric, and adult emergency departments in terms of fifty nurses from each department at Omdurman Military Hospital.

The nurses selected according to the following inclusion criteria:

- Nurse implemented triage before
- Nurses have not less than one year of experience in the emergency department.
- The nurse did not attend any courses about triage.
- Nurses are available at the time of data collection and willing to participate in the study.

Self-administered questionnaire was developed by the researchers to assess the nurses‘ socio- demographic characteristics such as age, marital status, rotation shift, educational qualifications, and years of experience in the emergency department in its first part. The second part of the questionnaire was designed by the researchers to assess the nurses‘ knowledge about emergency triage in the three different cases (Adult, Pediatric, and Obstetric triaging). It assesses the main concepts in triage. It included ten open-end questions. They are meaning of triage (1 question), triage principles (1 question), triage scale (1 question), triage assessment and allocation of triage category (1 question), prioritizing patients based on their clinical presentation (1 question), triage decision (1 question), risk factors of patient`s condition (1 question), objective data collection (1 question), subjective data collection and communication (1question), and specific nursing interventions for different cases (pediatric, obstetric or adult care) (1 question) (Gilboy *et al*., 2012; John. W & Sons, 2014) [11, 17]. This questionnaire distributed in the same form three times (pre, post-program implementation, and at one month‘s follow up) for the same group of nurses. The questionnaire Alpha Cronbach reliability test equal to 0.87.

Ttriage competencies observational checklist adopted from Australian College for Emergency Medicine (2019), Elsayed *et al*., (2014) [8], and Kevin *et al*., (2014) [22] to evaluate nurses‘ practices concerning triage process. It encompasses 55 statements distributed on seven essential competencies as followed: Emergency assessment (9 steps) including inspection, specification of medical risks (primary assessment), main complain, medication taken before admission, medical history, five minutes triaging, correct patient positioning, maintain privacy, and psychological evaluation. Clinical decision making (3 steps) that include determination of patient urgent health care need, specification of medical care, initiating priority treatment.

Nurses’ attitude measuring scale adopted from Suen *et al*., (2016) [30] and Elsayed, *et al*., (2014) [8] to assess the nurses‘ attitude toward triage activities. It was a three-point Likert type scale that consisted of 10 statements. It includes such statements as nurses‘ attitude toward triaging, patient care delay, patient reception, etc. The scale Alpha Cronbach reliability test equal to 0.87.

Data collected, scored, summed, organized, tabulated, and analyzed by a personal computer using the ―Statistical Package for the Social Science‖ (SPSS windows), version 19. Numerical data expressed as mean ± SD, and range. Qualitative data expressed as frequency and percentage. Chi-square (X2), and relations between different numerical variables were tested using the Pearson correlation. A P. value less was than (0.05) was considered significant, and less than 0.001, considered highly significant.

Results and discussion

Table (1) shows the socio-demographic characteristics of the studied nurses. It indicates that the higher percentage of the nurses' age ranged between 25 < 30 years. 76%, 80%, and 84% of nurses working at pediatric ED, obstetric ED, and nurses working at adult ED respectively were married. Concerning their rotation shift, 60%, 64% and 60% of nurses working at pediatric, obstetric ED, and an adult ED respectively had worked all shift rotations. Regarding their level of education, 50% and 54% of nurses working at obstetric ED and nurses working at adult ED respectively had secondary nursing education, while 52% of nurses working at pediatric ED had technical nursing education. As regards nurses' years of experience 54.0% and 46.0% of nurses working at obstetric ED and adult ED respectively have more than 5 years of experience, whereas 52% of nurses working at pediatric ED have1-<5 years of experience with a non- significant difference between nurses working at the three emergency department regarding their socio-demographic characteristics.

Table 1

Items	Nurses working at the pediatric Emergency department (n=50		Nurses working at obstetrics Emergency department (n=50)		Nurses working at the Medical Emergency department (n=50)		X2	P value
Age in years	Frequency	%	Frequency	%	Frequency	%	2.10	0.08
< 20	10	20.0	5	10.0	4	8.0		
20 < 25	15	30.0	12	24.0	12	28.0		
25<30	20	40.0	18	36.0	22	44.0		
≤ 30	5	10.0	12	30.0	10	20.0		
Mean ±SD	22.48±3.83		23.68±4.33		23.26±3.97			
Marital Status	Frequency	%	Frequency	%	Frequency	%	1.88	0.26
Single	12	24.0	10	20.0	8	16		
Married	38	76.0	40	80.0	42	84		
Rotation shift	Frequency	%	Frequency	%	Frequency	%		0.19
Morning	5	10.0	6	12.0	7	2.07		
Night	15	30.0	12	24.0	13	26.0		
All	30	60.0	32	64.0	30	60.0		
Educational	Frequency	%	Frequency	%	Frequency	%		

Table 2

Qualifications								
Secondary nursing education	20	40.0	25	50.0	27	54.0	2.45	0.18
Technical nursing education	26	52.0	20	40.0	20	40.0		
Bachelor of nursing	4	8.0	5	10.0	3	6.0		
Years of experience in the emergency department	Frequency	%	Frequency	%	Frequency	%		
< 1	6	12.0	3	6.0	5	10.0		
1 < 5	26	52.0	20	40.0	22	44.0	1.64	0.27
≥ 5	18	36.0	27	54.0	23	46.0		
Mean ±SD	5.46±4.21		5.96±4.23		6.56±3.78			

Table (2) points out that, the studied nurses‘ knowledge had improved through education guideline phases as 95% and 90% had unsatisfactory knowledge related to triage scale, triage assessment, triage decision, risk factors of patient`s condition, objective data collection, subjective data collection and communication, and nursing interventions during triage implementation before the program implementation, which improved to be most of them had satisfactory knowledge post-program implementation and at follow up respectively.

Table 3

Knowledge related to the implementation of triage	**Pre-program**		**Post –program**		**Follow up**	
	Satisfactory %	**Unsatisfactory %**	**Satisfactory %**	**Unsatisfactory %**	**Satisfactory %**	**Unsatisfactory %**
Triage definition	40.0	60.0	95.0	5.0	92.0	8.0
Triage Principles	37.0	63.0	96.0	4.0	95.0	5.0
Triage Scale	5.0	95.0	88.0	12.0	85.0	15.0
Triage assessment and allocate a triage category	5.0	95.0	88.0	12.0	85.0	15.0
Prioritize patients on the basis of clinical presentation	20.0	80.0	90.0	10.0	90.0	10.0
Triage decision	6.0	94.0	87.0	13.0	85.0	15.0
Risk factors of patient`s condition	5.0	95.0	88.0	12.0	85.0	15.0
Objective data collection	15.0	85.0	95.0	5.0	95.0	5.0
Subjective data collection an d communication	10.0	90.0	95.0	5.0	95.0	5.0
Nursing interventions	10.0	90.0	95.0	5.0	92.0	15.0

Table (3) demonstrates that, the studied nurses‘ practices improved throughout guideline implementation phases as most of them (90%) don‘t practice satisfactorily before triage education regarding to emergency assessment, clinical decision making and, and environmental hazards, which improved to reach the majority of them (96.0% and 90%) practices satisfactorily all the triage competencies immediately post program implementation and at follow up.

Table 4

Pre-program Items Done Not done			**Post-program Done Not done**		**Follow up Done Not done**	
	%	%	%	%	%	%
Emergency assessment	10.0	90.0	88.0	12.0	85.0	15.0
Clinical decision making	10.0	90.0	75.0	25.0	85.0	15.0
Triage intervention	35.0	65.0	96.0	4.0	96.0	4.0
Leadership and management activities	15.0	85.0	90.0	10.0	85.0	15.0
Safety of patients in the waiting area	15.0	85.0	90.0	10.0	85.0	15.0
Environmental Hazards	10.0	90.0	88.0	12.0	85.0	15.0

Table (4) reveals that there is an improvement in nurses' total attitude immediately, after, and at follow up program implementation scores for the majority of them. As (90%) and 88% of studied nurses showed a positive attitude toward triage, compared to 20% preprogram implementing, with statistically significant differences between the three phases ($P < 0.001$).

Table 5

Items	**Pre guideline**		**Post guideline**		**Follow up**	
	No	%	No	%	No	%
Positive	10	20.0	45	90.0	44	88.0
Negative	40	80.0	5	10.0	6	12.0
Mean attitude score X2	0.612±0.44	X^2 (1) = 15.02 X^2 (2) = 18.20 X^2 (3) = 10.04	2.46±1.06		2.22±0.86 P value<0.001**	

Triage is an autonomous nursing role that is vital to patient security and the efficient delivery of emergency care. The triage nurse must establish the capacity for critical thinking in environments where available data is inadequate,

incomplete, or vague (Elsayed, Ahmed, & Abdelhamid, (2014) [8]. Education has a crucial role in improving the performance of emergency department nurses. Therefore, this study aimed to evaluate the effect of triage education on nurses‘ performance in diverse emergency departments.

The current study revealed that the higher percentage of nurses` age ranged between 25 - ≤ 30 years with the mean age of the studied nurses in three groups, was found to be 22.48±3.83, 23.68±4.33 and 23.26±3.97years. Similar findings reported by Duko *et al*., (2019) [5], who mentioned that 86.1% were under 30 years. Regarding their marital status, more than three- quarters of nurses working at pediatric ED, obstetric ED, and nurses working at adult ED respectively married. These results disagreed with Kerie *et al* (2018) [21], who stated that nearly two thirds of the respondents were single in their study.

Also, more than half of Kerie‘s studied sample had not completed their high education and were secondary and technical nursing education Kerie *et al*., (2018) [21]. This finding is similar to the present study findings as about half of nurses in Obstetric ED, and Adult ED had secondary nursing education, plus more than half of nurses in Pediatric ED had technical nursing education. This finding represents a particular Egyptian situation of increasing numbers of technical nurses compared to their colleagues who are faculty graduated. This finding could be explained by the vast numbers of secondary schools (either three of five years) and technical institutes compared to the number of nursing faculties all over the country. It was not the case with Duko *et al*., (2019) [5] study when more than two-thirds of their study completed a bachelor‘s degree in nursing. As regards nurses' years of experience more than half and more than one- third of nurses working at obstetric ED and nurses working at adult ED respectively have 5 or more years of experience, whereas 52% of nurses working at pediatric ED have one to less than five years of experience in emergency departments. This finding agreed with Kerie *et al*., (2018) [21] and Duke *et al*., (2019), who found that about 49.2% and 79.2% of the respondents had working experience of less than one year and< three years respectively in the emergency department. Only 19.6% of participants worked in the triage room with a minimum of 1 month and a maximum of 48 months.

Moreover, the current study showed that more than two-thirds of the studied nurses‘ knowledge about triage was unsatisfactory before the program implementation. This knowledge level was significantly improved in the current study for most of them after program implementation, and maintained at the follow up evaluation, as regards triage definition, triage principles, triage scale, triage assessment and allocate a triage category, prioritizing patients based on clinical presentation, triage decision, risk factors of patient`s condition, objective data collection, subjective data collection and communication, and appropriate nursing interventions. This finding may be due to that, the settings of the study do not follow any guideline or even allow attending programs regarding triage principles or application, which negatively affected their awareness and performance. Similarly, Mohey & Alazmi, (2017) [23] illustrated in a study entitled

―Primary Healthcare Emergency Services in Alexandria‖ that all the Primary Healthcare (PHC) facilities had no written clinical practice guidelines for providing primary emergency services, no plans for pediatric emergency triage, assessment or treatment, and no clear referral procedures. This finding also supported Ebrahimi *et al*., (2016) [6] who found that, the performance of triage nurses in the identification of triage level before training on emergency severity index (ESI) was 42.3% accuracy before the intervention and improved to 93.9% after training in Khatam-al-Anbia hospital (Iranshahr). Hence, the first hypothesis supported. This finding also reinforced by a recent study done by Reisi *et al*., (2018) [26], who detect a low-level knowledge score among emergency nurses employed in triage.

The present study demonstrates that, the studied nurses‘ practices improved throughout the education guideline implementation phases as most of them don‘t practice triaging before the guideline implementation, particularly in respect to emergency assessment, clinical decision making, triage intervention, leadership, and management activities, patients‘ safety in the waiting area, and environmental hazards. This deficient practice greatly improved to reach the majority of them had practices correctly immediately after program implementation and at their follow up evaluation. This finding was also agreed with Kerie *et al*., (2018) [21], who stated that greater than half of the nurses had a moderate level of triage skills before training in a study conducted in Addis Ababa, Ethiopia. A similar result reported by Aloyce *et al*., (2014) [1], who indicated that the level of triage nurses‘ skill was 52% before triage education in a study conducted in Dar Es Salaam, Tanzania. This result was accordance with Rahmati *et al*., (2013) [25], who found that the level of knowledge and practice in triage after the intervention was higher than before training with a statistically significant differences between phases of program evaluation in a study conducted in Vali Asr Hospital of Fasa University of Medical Sciences. Haghdust *et al*., (2010) [14] when reported comparable findings. The studied nurses showed moderate to excellent performance before training, but none of the participant exhibit poor performance after training. The poor performance before training in the current study might be due to their deficient knowledge, absence of orientation for newly graduated and newly recruited nurses, lack of job training, continuous education. Also, unavailability of resources, and insufficient materials, equipment in most governmental hospitals. Moreover, overcrowding in governmental hospitals emergency departments, which lead to an increase in the workload on nurses caring for such a group of patients that result in inappropriate nursing care. This explanation emphasized by several studies. Goransson *et al*., (2016) reported that 65.4% of emergency nurses did not attend training regarding triage skills in Indonesia. In Sweden, 60.3% of the nurses did not attend any triage training (Fathoni *et al*., 2010) [9]. A study conducted in Switzerland reported a comparable finding of 59.6% of the nurses lacking the appropriate triage training (Jordi *et al*., 2015) [20]. This finding is supporting the second research hypothesis. John & Sons, (2014) [17] reported similar findings and emphasized that the educational training of triage is essential than work experience (that not grounded on a sound base) in triage decision making (Considine *et al*., 2017) [3].

The current study also, denoting to the stability of knowledge and performance improvement with a slight decrease when comparing the post and follow up evaluation of the studied nurses. Nurses clarified this finding of

forgetting some non-important, less familiar topics, and focus attention only on the typical case situations. The stability of the performance level has examined in many studies. One of these studies is Corner & Wilson-Barnett (2012) [4] study. They reported a nurses‘ performance level declining after three months of training. An earlier study by Gould & Chamberlain (2014) [12] explained that most of the nurses forgotten or pay less attention to the practical part of the training, hence affecting their performance. This finding emphasized the need for continuous education, particularly in such critical areas of care (Rahmati, *et al*., 2013) [25].

The current study showed that there is an improvement in nurses' whole attitude immediately post and one month after program implementation as the number of nurses with a positive attitude increased with a highly statistically significant difference (P<0.001) between pre, post, and follow up. This finding may be due to that the triage education had a noticeable effect on enhancing nursing performance through the program implementation phases. A strong positive attitude revealed by Afaya *et al*., (2017). The majority of nurses (92.3%) supposed triage system should not only be implemented in ED but also in all departments of the hospital. A higher number of nurses, 62 (95.5%) agreed and strongly agreed that nurses at ED should undergo training/workshops on triage.

Furthermore, Mohey & Alazmi, (2017) [23] stated in his study that, about half of the studied physicians (49.8%) agreed and 47.1% of nurses strongly agreed that emergency services were an essential component of primary health care. This further support the third study hypothesis. Augmenting the results of the current study, it evident that education and training courses have a vital role in improving nurses' knowledge, performance, and attitude toward triage education.

Thabo *et al* (2019) [31] showed that there is a correlation between triage knowledge and job title (p- value = 0.046). Registered nurses, specialty nurses, and enrolled nurses, were found to know more than auxiliary nurses. However, the study discovered that, among the nurses with knowledge, 61% exercised poor triage practice, while only 30% showed evidence of good practice. Thus, nurses have knowledge regarding triage but have difficulty in converting their factual knowledge into practice, as they scored poorly on questions about the practice. In addition, there emerged a significantly positive relationship between triage knowledge and job titles.

Conclusion and Recommendations

It could conclude that the nurses who are subjected to triage education improved in their knowledge, practice, and attitude at the post- intervention evaluation compared to their pre- intervention level. Moreover, they showed a higher knowledge, competent practice, and positive attitude that maintained at one month follow up with a statistically significant difference among the three phases of the study. So, it could be evidenced that triage education program improved nurses‘performance regarding the application of triage for adult, pediatric, and obstetric emergency departments.

As far as recommendations are concerned, the paper recommends that there is a crucial need to publish and disseminate guideline educational program in ED service to improve nurses ‘performance about triage for adult, pediatric, and obstetric patients. Also there is a constant need to foster and sustain the improvements in practices regarding triage in ED through the orientation of new nurses, on the job training, and continuous education. A further longitudinal study should be done to evaluate the effect of the researchers' guideline educational program on the nurses‘ performances toward triage in ED.

References

1. Aloyce R, Leshabari S, Brysiewicz P. Assessment of knowledge and skills of triage amongst nurses working in the emergency centers in Dar es Salaam, Tanzania. Afr J Emerg Med,2014:4(1):14-8.
2. Australasian Collage for Emergency Medicine. Guidelines on Emergency Department Design. Retrieved at, 2012. from www.healthcaredesign magazine. com.
3. Considine J, Botti M, Thomas S. Do Knowledge and Experience Have Specific Roles in Triage Decision-making? Academic emergency medicine, 2017:14(8):722-6.
4. Corner J, Wilson-Barnett J. The newly registered nurse and the cancer patient: an educational evaluation. Int J Nurs Stud,2012:29(2):177-90.
5. Duko B, Geja E, Oltaye Z, Belayneh F, Kedir A, Gebire M *et al*. Triage knowledge and skills among nurses in emergency units of Specialized Hospital in Hawassa, Ethiopia. cross sectional study. BMC Research Notes,2019:12:21.
6. Ebrahimi M, Ghanbarzehi N, Gorgich ZG, Darban F, Shirzadi F. The effect of triage training on the performance of triage nurses and emergency medical staff of Iranshahr. International Journal of Medical Research & Health Sciences, 2016. ISSN No: 2319-5886, 5, 9S:190- 196.
7. Elbashir Hassanat, Elfaki Badria. Towards an Emergency Nursing Specialization in Sudan. IOSR Journal of Nursing and Health Science,2017:06:42-45.
8. Elsayed Nora, Ahmed Eglal, Elhamid Magda. The Expected Role of Triage Nurse in Emergency Reception of a University Hospital, in Egypt. Journal of Biology, Agriculture and Healthcare, 2014, 4(16).
9. Fathoni M, Sangchan H, Songwathana P. Triage knowledge and skills among emergency nurses in East Java Province, Indonesia. Aust Emerg Nurs J,2010:13(4):153.
10. Fernandes CM, Tanabe P, Gilboy N *et al*. Five-level triage: a report from the ACEP/ENA Five-level Triage Task Force. J Emerg Nurs,2015:31:39-50.
11. Gilboy N, Tanabe T, Travers D, Rosenau A. Emergency Severity Index (ESI): A Triage Tool for Emergency Department Care, Version 4. Implementation Handbook 2012 Edition. Rockville, MD: Agency for Healthy Research and Quality,2012.
12. Gould D, Chamberlain A. Infection control as a topic forward-based nursing education. Journal of Advanced Nursing,2014:20(2):275-82.
13. Grossmann FF, Delport K, Keller DI. Emergency Severity Index: Deutsche Übersetzung eines validen Triageinstruments. Notfall Rettungsmed,2019:12:290-2.
14. Haghdust Z, Safari M, Yahyavi H. Effect of training on knowledge, attitude and practice of triage nurses in emergency hospital Poursina. Guilan. Nursing and Midwifery,2010:20(64):14-21.

15. Iserson KV, Moskop JC. "Triage in medicine, part I: Concept, history, and types", 2007.
16. Annals of Emergency Medicine,2007:49(3):275-81.
17. John W, Sons L. Emergency Triage: Manchester Triage Group, 3rd Ed. Published, 2014. ISBN 978-1-118-29906-7 (pbk.: alk. paper) – ISBN 978-1-118-29902-9– ISBN 978-1-118-29903-6 (emobi)–ISBN 978-1-118-29904-3 (epdf) – ISBN 978-1-118-29905-0 (epub)
18. Jordi K, Grossmann F, Gaddis GM, Cignacco E, Denhaerynck K, Schwendimann R *et al*. 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,2015:23(1):62.
19. Kerie S, Tilahun A, Mandesh A. Triage skill and associated factors among emergency nurses in Addis Ababa, Ethiopia. a cross-sectional study. BMC Research Notes,2018:11:658.
20. Kevin MJ, Marsden J, Windle J. Manchester Triage Group, issuing body. Emergency triage / Manchester Triage Group, 2014. ISBN 978-1- 118- 29906-7 (pbk.: alk. paper) – [DNLM: 1. Triage methods. 2. Emergency Service, Hospital. WX 215] RA975.5.E5 362.18– dc23.
21. Mohey A, Al azmi SF. Primary Healthcare Emergency Services in Alexandria, Egypt. Faculty of Medicine, University of Alexandria. Quality in Primary Care,2017:25(5):303-315.
22. Pitts SR, Niska RW, Xu J, Burt CW. National Hospital Ambulatory Medical Care Survey: 2006 emergency department summary. Natl Health Stat Report, 2018, 1-38.
23. Rahmati H, Azmoon M, Meibodi MM, Zare N. Effects of Triage Education on Knowledge, Practice and Qualitative Index of Emergency Room Staff. A Quasi-Interventional Study. Bull Emerg Trauma,2013:1(2):69-75.
24. Reisi Z, Saberipour B, Adienh M, Hemmatipour A, Shahvali EA. The level of awareness of emergency department nurses of the triage principles in teaching hospital. Journal of Nursing and Midwivery Science,2018:5(1):32-37.
25. Rutschmann OT, Siber RS, Hugli OW. Empfehlung der Schweizerischen Gesellschaft für Notfall- und Rettungsmedizin (SGNOR) zur Triage in Schweizer Notfallstationen. Schweiz Ärztezeitung,2019:90:1-2.
26. Schellein O, Ludwig-Pistor F, Bremerich DH. Manchester triage system: Process optimization in the interdisciplinary emergency department. Anaesthesist,2018:58:163-70.
27. Steffen W, Tempka A, Klute G. Falsche Patientenanreize in der Ersten Hilfe der Krankenhäuser. Dtsch Arztebl,2017:104:1088-91.
28. Suen NI, Wong T, Chow F, Kong B. Use of physical restraints in rehabilitation settings:s taff knowledge, attitudes and predictors. Journal of Advanced Nursing. Tool for Emergency Department Care, Version 4. Implementation Handbook 2012 Edition. AHRQ Publication No. 12- 0014. Rockville, MD. Agency for Healthcare Research and Quality. November 2011,2016:55(1):28-20.
29. Thabo Phukubye, Masenyani Mbombi, Tebogo Maria Mothiba. Knowledge and Practices of Triage amongst Nurses Working in the Emergency Departments of Rural Hospitals in Limpopo Province The Open Public Health Journal,2019:12(1):439-448.