

Triage Prehospital EMS and Medical Care

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Abstract

Introduction: Prehospital emergency medical services (EMS) are essential to emergency medical care. They provide emergency assessment and treatment for seriously ill or injured patients and transport them by ambulance to an emergency department. Adopting triage methods for systematically prioritizing patients according to how urgent patients need care, including Triage of requests for acute medical treatment, is a promising development in our healthcare system. In Kosovo, there is a gap between the effects of prehospital triage systems and the impact of using the same triage system in two or more EMS settings. In this quality improvement study, implementing the TT app intervention was associated with higher rates of inefficient Triage in prehospital settings. However, supporting EMS professionals in their decision-making by calculating the probability of an individual patient needing specialized care at the scene of injury is a new and promising approach to optimize Triage in the field. If we can fully realize the potential of this approach, it could significantly improve the efficiency and effectiveness of our emergency medical care, leading to better patient outcomes. Standards and most health professionals need to be educated and trained in this critical component of EMS. Education, education, and training for the three levels of health care should be an obligatory component to enhance the quality of emergency medical care for children and adults at risk. It is high time to develop and test a conceptual triage scheme or model that will rely on a triage system that responds to the conditions of our health system. Develop clinical guidelines, algorithms, and triage protocols at the three levels of health care. All healthcare professionals must be educated and trained in ongoing coaching, communication courses, BLS AED, Pediatric, PHTLS, Adult Advanced Life Support, ATLS, and International Trauma Life Support.

Conclusion: Triage is vital in optimizing patient outcomes in the high-pressure EMS world. It is the process of rapidly assessing a patient's condition to determine the urgency of care and the most appropriate destination for definitive treatment. Done effectively, prehospital Triage ensures that patients receive the right level of care at the right time, maximizing their chances of survival and minimizing long-term complications.

Keyword: Triage. Triage system, prehospital, EMS, training, and education.

Introduction

Triage, derived from the French word “trier,” meaning to sort, is critical in emergency medical services (EMS) and prehospital care. [1] It involves rapidly assessing patients to determine the severity of their conditions and prioritizing their treatment and transport to appropriate medical facilities. Effective Triage is essential for optimizing patient outcomes, particularly in mass casualty incidents (MCIs) or situations with limited medical resources. This discussion explores Triage's principles, methods, challenges, and importance in prehospital EMS and medical care. [1, 2]

Prehospital emergency medical services (EMS) are essential to emergency medical care. Prehospital EMS provides emergency assessment and treatment for seriously

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ill or injured patients and transportation by ambulance to an emergency department [3].

In addition, differences at the international level in triage systems limit the capacity to benchmark. The country-level triage system needs to be more organized and organized. [3]. Kosovo is not a synchronized system, but health system organizations have no standard normative tri-level triage system. During the prehospital phase, the emergency medical considers patients' condition according to illness, injury, and disease and decides on transport to an appropriate hospital according to severity. [4] It can affect patient survival and treatment prognosis because, despite intervention at this early stage, problems such as incorrect Triage of severity and inappropriate hospital selection may occur, indicating a need for improvement in the process. [3, 4, 5].

WHO Emergency triage, assessment, and treatment guidelines are used to identify children with life-threatening problems who present with signs and symptoms that should be treated as medical emergencies. However, the Kosovo Ministry of Health should remember that this critical component should create mandatory triage standards for the three healthcare needs. [6]

It also needs advanced, empowered EMEA and the triage system as an essential component of healthcare, along with education and training of healthcare professionals to enhance the quality of emergency medical care for children and adults at risk. [7].

Prehospital emergency medical services (EMS) are essential to emergency medical care. Prehospital EMS provides emergency assessment and treatment for seriously ill or injured patients and transportation by ambulance to an emergency department [8]. Within the emergency medical system, Triage helps classify emergency patients' symptoms according to severity and prioritizes providing limited medical resources to patients. It means they can be assessed and classified to enable placement for the correct treatment in emergency rooms or disaster situations [9].

During the prehospital phase, nurses and doctors classify various patient conditions and decide on transport to an appropriate hospital, accounting for the patient's condition and severity [10]. It is undertaken through the triage process. Correctly classifying trauma patients and transporting them to a hospital for suitable treatment can affect patient survival and treatment prognosis and can shorten treatment time and medical preparation in the hospital [11].

Incorrect Triage can lead to poor treatment and prognosis among emergency patients: Triage can lead to the overuse of limited medical resources and cause unnecessary transfer to tertiary hospitals. At the same time, Triage may result in a delay in treatment for critically ill patients, which could ultimately negatively affect patient prognosis and safety [8-12]. While studies have shown that the development and

application of the five-level prehospital triage system in Canada and Japan could increase the concordance between prehospital and in-hospital Triage, there still needs to be a match between prehospital and hospital Triage [14].

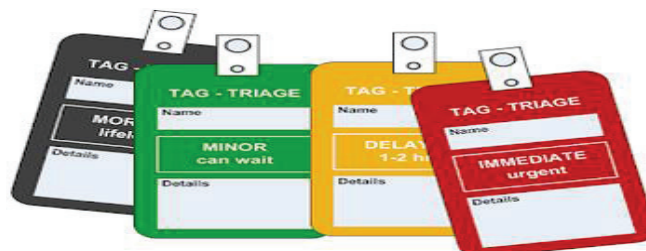


Figure 1. Triage tags according to priorities

Prehospital and hospital-based health professionals communicate patient information at the handover stage to ensure that critically ill patients receive high-quality acute care promptly [15, 16].

However, it has been found that under-triage during the prehospital phase for pediatric patients means that approximately a quarter of patients with potentially serious injuries and illnesses requiring treatment in high-resource hospitals are transferred to general emergency departments, delaying treatment initiation [17]. Simple and Rapid Triage-Treatment System START is an acronym for Simple Triage-Treatment System, and it is defined as a method that first responders use effectively and efficiently to assess all victims in a mass disaster. [17, 18]

First responders – first responders on the scene use a triage tool called a triage tag to categorize victims by severity of injury. The entire evaluation process should be done in 60 seconds or less. Once the assessment is complete, the victims should be tagged, rated, and categorized from one to four. [19].

Priority Number	Priority Color	Name	Description
1	Red	Immediate/Emergency	Life in imminent danger and require immediate treatment
2	Yellow	Delayed	Life not in immediate danger but requires urgent, not immediate, medical care
3	Green	Minimal	Minor injuries that will eventually require treatment
No priority	Black	Expectant/Dead	Injuries are too extensive to be treated with available resources

Figure 2. Triage according to priorities. Source: Disaster Medicine Triage (2024) – International Emergency Medicine Education Project.

Victims classified RED or requiring immediate care should be moved first, followed by those labeled YELLOW or delayed, and then proceed carefully to victims labeled GREEN, who can wait for care.



Photo 1. Simple Triage and rapid treatment (START) involves primary screening of the injured in 90 seconds. Parameters are breathing, circulation, and state of consciousness. Techniques: XDRSABCDE.

Therefore, this study aims to identify the overall trend of research conducted on prehospital Triage by analyzing and organizing research by the subject range literature review method and to present the research fields necessary for improving future prehospital Triage to clinical practitioners, policymakers, and researchers [20]. A scoping review is used to map literature on a particular subject or study area to identify the type of evidence, data, key concepts, and differences to suggest the direction of future research [21]. In addition, unnecessary repetitive research in a specific field can be avoided; it may be used as primary data for setting the subject range and priority of systematic literature reviews to be conducted in the future [22].

Thus, appropriate categorization at the prehospital stage is also essential for addressing overcrowding in the emergency room, preparing treatment resources, reducing treatment time for critically ill patients, and preparing medical staff [23]. Thus, appropriate categorization at the prehospital stage is also essential for addressing overcrowding in the emergency room, preparing treatment resources, reducing treatment time for critically ill patients, and preparing medical staff [24].

This paper aims to train and enable prehospital emergency health care professionals for children and adults to classify, assess, monitor, treat, and transport quickly with medical care. To understand, learn, and apply the latest guidelines of the priority triage system reducing morbidity, disability, and mortality in the hospital pediatric emergency department. Triage purposes are to identify patients needing immediate resuscitation, assign patients to a predesigned patient care area, thereby prioritizing their care, and initiate diagnostic/therapeutic measures as appropriate. In combat, medical resources are restricted, and Triage is challenging.

Material and Methods

The research material was taken from the prehospital medical emergency archive Viti from January - December 2023. The research is retrospective; triaging the sick and injured life-threatening is by researching the triage model. In the study, 6650 cases were taken that requested emergency medical help.

Data processing was described using statistical parameters (processed Excel Word), structure index, arithmetic mean, and standard deviation. Statistical tests: X2-test and T-test. The test verification was done for the 95% and 99% confidence levels, respectively, for $p < 0.01$. Description of data processing Description of data processing is performed using statistical parameters (worked out Excel Word), such as structure index, arithmetic mean, and standard deviation. Statistical tests: X2-test and T-test.

Test verification was done for the 95% and 99% confidence levels, respectively, for $p < 0.01$ and $p < 0.05$.

Results

The research material was taken from the archive of the prehospital medical emergency for the period January - December 2023. The research is retrospective; the way of triaging the sick and injured life-threatening researching the triage model. In the study, 6650 cases required emergency medical assistance—description of data processing (Tab. 1).

Pathologies	No. of cases	%
No emergent	4080	61.35
Emergent	2570	38.65
Total	6650	100

Table 1. Number of emergency and non-emergency cases

There were 2570 emergency cases or 61.35%, and 4080 non-emergency cases, or 38.65% (Tab. 1).

Gender	No. of cases	%
Men	4120	61.95
Females	2530	38.05
Total	6650	100

Table 2 Number of cases by age

Number of cases by gender: men were 4120 cases or 61.95%, and women were 2530 or 38.05% (Tab. 2).

Triage cases	No. of cases	%
Cardiac	2530	38.04
Neurology	1345	20.22
Respiratory	1030	15.48
Gastroenterology	905	13.60
Metabolic	523	7.90
Trauma	272	4.09
Toxicologic	45	0.67
Total	6650	100

Table 3 Triage by Systems

The number of cases triaged according to cardiac systems was 2530 cases or 38.04%; neurological were 1345 cases, or 20.22%; respiratory, 1030 cases, or 15.48%;

gastroenterological was 905 cases, or 13.60%; metabolic were 523 cases or 7.90%, trauma was 272 cases or 4.09%, toxicological were 45 cases or 0.67%. (Tab. 3).

Number of cases by place	No. of cases	%
City	4345	65.33
Village	2305	34.67
Total	6650	100

Table 4 Number of cases by place.

According to the city residence, the number of cases was 4345, or 65.33%; in the village, there were 2305, or 34.67% (Tab. 4).

Frequent life-threatening acute diseases and injuries	No. of cases	%
Heart attack	123	1.84
Chest pain	1578	23.72
cardiac arrest	20	0.30
Hypertension	1598	24.03
Hypotension	178	2.67
Asthmatic attack	434	6.52
Obstructive disorders of the lungs	588	8.84
Diabetes	590	8.87
Stroke	156	2.34
Epileptic attacks	45	0.67
Disorders consciousness	67	1.00
Allergic reactions	34	0.51
Acute headaches	345	5.18
Back pain	230	3.45
Acute abdominal pain	130	1.95
Acute bleeding	35	0.52
Head injuries	230	3.45
Injuries to the neck and spine	15	0.22
Chest injuries	11	0.16
Abdominal injuries	13	0.19
Osteomuscular injuries	28	0.42
Pelvic injuries	10	0.15
Burn	14	0.21
Status febrile	178	2.67
Total	6650	100

Table 5 Frequent life-threatening acute diseases and injuries.

Presentation of the three clinical signs of shock	No. of cases	%
Cold extremes	8	38.04
Capillary Duration > 3 s	6	28.23
Pulse weak and fast	7	33.73
Total	21	100

Table 6 Presentation of the three clinical signs of shock traumatic.

Immediate treatment begins when rapid Triage is made and life-threatening medical problems are identified, such as airway, respiratory and circulatory evaluation, ABC in case of injuries, and circulatory diseases, airways, and respiratory tract CAB)

Discussion

In this study, we applied a scoping review method to examine the overall trend of research concerning prehospital phase triage to identify potential future research directions for future prehospital Triage for clinical practitioners, policymakers, and researchers. This study has several limitations.

First, terms used to represent prehospital Triage are mixed with prehospital emergency care and field triage. Kisook Kim Prehospital triage in emergency medical services system: A scoping review Pub Med. 2023 Thus, while several word combinations were used to search, some related literature may have yet to be identified. Second, this study only looked for published studies, and unpublished papers (such as theses) or grey documents were not included in the final selection. [25, 26]

Such documents may discuss the current.

Challenges in Prehospital Triage include a) Resource Limitations: Limited medical supplies and personnel can hinder effective Triage; b) Ensuring clear communication between EMS personnel and receiving medical facilities; c) Environmental Factors: Adverse weather, rugged terrain, and hazardous conditions can complicate Triage and transport; d) Emotional Stress: High-stress situations can impact the decision-making ability of EMS personnel. e) Training and Consistency: Ensuring all EMS personnel are adequately trained and follow consistent triage protocols. [27]

Effective Triage needs to a) maximize survival: Ensure that critically injured patients receive immediate care, improving survival rates; b) make Efficient Use of Resources, Prioritizing resource allocation, preventing the overwhelming of medical facilities; c) improve overall Outcomes; Reduce mortality and morbidity rates by providing timely and appropriate care. d) Enhances Disaster Response: Facilitates organized and efficient response during mass casualty incidents and disasters. [28, 29]

Conclusion

Triage in prehospital EMS and medical care is a vital component of emergency response to optimize patient outcomes through rapid assessment, categorization, and prioritization. Utilizing standardized methods like START and JumpSTART ensures consistency and efficiency. Despite resource limitations, environmental factors, and emotional stress, effective Triage maximizes survival, optimizes resource use, and improves patient outcomes. In the face of mass casualty and resource-limited scenarios, well-executed Triage can make the difference between life and death, highlighting its indispensable role in emergency medical care.

Conclusions

The Ministry of Health of Kosovo should remember that this critical component should create a training model for our country's needs and standard clinical guidelines, algorithms, and protocols to make correct pediatric Triage compulsory. Healthcare can be improved by advancing and strengthening the triage system as an essential component.

Research is proposed that focuses on various non-traumatic patient types, prehospital triage education, and the development of training programs to reduce errors in the emergency patient handover process between prehospital and hospital health professionals and to improve patient health and quality of life. [17].

Kosovo still needs an official document or protocol for triaging the sick and injured at the country level. Triage is done according to the skills of experienced professionals, but we often need to correct assessments. The Ministry of Health of Kosovo should think in this direction and form working groups for the basic design of standardization and treatment protocols for Triage at the three levels of emergency medical care.

Education, education, and training of health care professionals for the three levels of health care should be an obligatory component to enhance the quality of emergency medical care for children and adults at risk. It is high time to develop and test a conceptual triage scheme or model that will rely on a triage system that responds to the conditions of our health system. Research is proposed that focuses on various non-traumatic patient types, prehospital triage education, and the development of training programs to reduce errors in the emergency patient handover process between prehospital and hospital health professionals and to improve patient health and quality of life.

Recommendations

Institutionally support the advancement and empowerment of the triage system as an essential component of the necessary pediatric and adult emergency triage. Develop clinical guidelines, algorithms, and triage protocols at the three levels of health care. All healthcare professionals must

be educated and trained in ongoing coaching, communication courses, BLS AED, Pediatrics and adult, PHTLS, Adult Advanced Life Support, ATLS, and International Trauma Life Support.

Disclosure

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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