Evaluation of triage quality in the emergency department: a scoping review protocol

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Review objective/questions: The objective of this scoping review is to explore the existing literature on the evaluation of the quality of triage for patients of all ages and medical conditions in emergency departments (EDs). The question for this review is: How is triage in the ED evaluated? More specifically, we are interested in answering the following sub-questions:

i) What methods are used to evaluate the quality of triage in the ED?
ii) What indicators are used to evaluate the quality of triage in the ED?

Keywords Health care quality, access, and evaluation; emergency department; triage

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Introduction

The emergency department (ED) is a medical facility organized and managed to provide treatment for patients in need of urgent care for conditions of high or medium complexity.[1] Overcrowding in the ED has become an increasingly significant worldwide public health problem. The current increased demand for medical care and deficit of hospital/emergency beds contributes to the escalation of this issue.[2] Such a scenario leads to poor quality care, higher mortality among patients, both admitted and discharged, and higher rates of patients leaving the ED without being seen.[3]

In order to control overcrowding in EDs, triage was proposed as a solution.[1] Triage aims to determine the priority of medical care and waiting time according to the severity of each patient's medical condition.[4-6] In some cases, triage can allow for planning and preparation of the needed resources for initial care.[7,8]

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Differentiating ED patients according to the severity of their condition contributes to providing time-dependent interventions, avoiding preventable adverse events and clinical deterioration, decreasing morbidity and mortality,[9] and presumably limiting the ED overcrowding.

Since the early 1990s, several countries have developed and introduced different triage protocols in EDs.[10] Currently, the most commonly used protocols for ED triage are the Australasian Triage Scale (ATS),[11] the Manchester Triage System (MTS),[12] the Emergency Severity Index (ESI),[8] and the Canadian Triage and Acuity Scale (CTAS).[13] The ATS, developed in Australia in 1994, consists of five categories of urgency with clinical descriptors of symptoms, as well as clinical and behavioural parameters.[11] The MTS, developed in the United Kingdom in 1994, has five emergency color-coded categories of urgency of treatment based on the user's main complaint through flowcharts and discriminators for each of the diagrams.[12] The ESI, used in the United States since 1999, defines priority based on a single flow chart consisting of a clinical assessment and the diagnostic resources required for appropriate patient care.[8] The CTAS, implemented in Canada in 1999, is widely used throughout the country and has five

categories of urgency that correspond to five clinical priority colors and their respective response target times.[13]

The use of EDs by non-urgent patients has contributed to the transformation of these departments to critical care areas in relation to promoting the quality of care provided.[14] Thus, it is necessary for discussions on the quality of EDs to have a prominent place in the agendas of managers and professionals in order to establish a consensus regarding the concept of quality and its applicability in healthcare settings.[15,16]

The most widely used concept for evaluating the quality of healthcare services is that proposed to obtain the greatest benefits with the lowest risk (and cost) for patients. The benefits should be defined according to their attainability, the resources available, and existing social values.[17] The concept of quality of health care is defined by Donabedian in terms of six fundamental attributes: effectiveness, efficiency, optimization, acceptability, legitimacy and equity.[18] Evaluating each of these attributes provides data for decision making and audits of health processes.[18,19]

The use of indicators is recommended in all EDs to monitor triage quality, as EDs are critical care areas.[20] Indicators are measures based on pre-established criteria and standards of the structure of services, processes that characterize health care, and outcomes.[17] Structure denotes the attributes of the setting in which the care occurs (the physical, human, material, financial and organizational aspects of care); process is related to activities actually conducted in giving and receiving care (involving health professionals and patients); and outcomes are the changes in individuals or populations related to the health care they received.[21] Indicators include quantitative and qualitative measures employed as guides to monitor and evaluate a service's assistance and activities.[22] An indicator is also considered a type of ''red flag'' or warning of the reality of a situation, and serves as an evaluation of the process and its results.[23]

Triage has been adopted to improve the quality of EDs by assuring that their users' waiting time is consistent with their urgency levels. Therefore, it is necessary to evaluate if triage protocols implemented in EDs actually adequately differentiate the most urgent from the less urgent patients. Although many protocols are accompanied by guidelines for their audits, including quality indicators,[5,8,11] there is a considerable diversity of approaches that have been used to assess the performance of triage in EDs. Some protocols describe the use of indicators such as: the number of patients categorized in each priority level, the time taken between admission and triage, the time spent executing the triage, the time between the completion of triage and the first medical treatment, and the readmission rate 72 hours later for the same medical complaint.[5,8] Properties of the triage protocols considered in the literature are also varied and often include the following:

i) Effectiveness: relating to the reduction of time spent by the patient in the ED[24] and the evaluation of waiting time for triage and time taken to begin treatment in the ED[25,26]
ii) Acceptability: relating to the patient's satisfaction[27]
iii) Efficacy: relating to the results obtained[27,28]
iv) Inter-rater reliability between healthcare providers[29-31]
v) Reliability and validity of triage emergency care protocols[31-33]
vi) Sensitivity or specificity to ensure that a certain triage system is safe.[34]

The heterogeneity of the evidence presented in the primary studies, which is determined by the different designs and variables investigated, is one of the factors limiting the integration of research results on triage performance in the ED,[34] and the quantification, measurement, and tracking of the quality of triage in the ED.[20,34,35] Given the exponential increase in healthcare demands in the ED in the past decades, evaluating the quality of triage should contribute to the provision of safer and more efficient services to the population. It should also improve an institution's ability to monitor the quality of these services and implement corrective measures when needed. The main rationale for this scoping review is that the diversity of methods used to evaluate the quality of the triage limits the use of the results of these studies in initiatives designed to improve the quality of triage in the ED.

A preliminary search for systematic reviews was conducted in the *JBI Database of Systematic Reviews and Implementation Reports* and Cochrane Library on August 16, 2018. Four systematic reviews[28,34-36] and a systematic review protocol[25]

were found. The systematic reviews that were found were aimed at evaluating the performance of triage protocols,[25,28,34,35] the impacts in patient satisfaction of care[35,36] and utilization of hospital resources.[35] No scoping reviews about this topic were found by examining PubMed, Epistemonikos and CINAHL. The proposed review intends to examine the approaches used in the evaluation of the triage protocols and does not intend to directly evaluate these protocols.

The mapping of the methods and indicators used to evaluate triage in the ED should facilitate the identification of the conceptual limits of this area and the examination of the types of evidence that studies on this topic have attempted to produce so that specific questions can be posed and addressed effectively.[37] The purpose of this scoping review, therefore, is to explore the existing literature about methods and indicators for evaluating the quality of triage in the ED, examine and map the variables involved in these studies, and identify the knowledge gaps in this area. This review will consider as methods the design of the evaluation, procedures and techniques used to obtain the related data, types of participants/population included in the evaluation, and sample size.

Inclusion criteria

Participants

This scoping review will consider studies conducted with patients of any ages and with any medical conditions.

Concept

The concepts of interest are the methods and indicators used in the evaluation of EDs triage protocols. This review will consider as methods: the design of the evaluation, procedures and techniques used to obtain the related data, types of participants/population included in the evaluation and sample size. As indicators, the review will consider measures used to express the performance of the triage, based on structure (how it was organized), process (what was done), and outcome of care (what happened to the patient).

Context

This scoping review will consider as context the hospital ED. Any studies conducted in pre-hospital settings or non-hospital health clinics will be excluded. No geographic limits will be applied.

Types of studies

This scoping review will consider experimental and quasi-experimental study designs, including randomized controlled trials, non-randomized controlled trials, before and after studies, accuracy test diagnostic studies, and methodological studies. In addition, analytical observational studies including prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies will also be considered. This review will also consider descriptive observational study designs, including case series, individual case reports, and descriptive cross-sectional studies. Systematic reviews and meta-analyses will be included. Information from relevant organizations including white papers, conference proceedings, and other reports related to the concept of this scoping review will be considered. Other relevant documents, such as manuals and guidelines, will also be considered. Qualitative studies including, but not limited to, phenomenology, grounded theory, ethnography, qualitative description, action research and feminist research will also be considered. Studies published in English, Portuguese or Spanish will be included. Studies published after 1990 will be examined because after that decade, triage of patients in emergency situations became necessary due to overcrowded emergency rooms worldwide. It was at this time that standardized guidelines for triage of patients in EDs were first published.[10]

Methods

The proposed review will be conducted in accordance with the Joanna Briggs Institute (JBI) methodology for scoping reviews.[37,38]

Search strategy

The search strategy aims to find both published and unpublished studies. A three-step search strategy will be used in this review. An initial limited search of PubMed and CINAHL has been undertaken followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe articles. This informed the development of a search strategy which will be tailored for each information source. The initial search strategy for

PubMed and CINAHL is detailed in Appendix I. A second search using all identified keywords and index terms will then be undertaken across all included databases. Thirdly, the reference list of all included reports and articles will be searched for additional studies.

Information sources

The databases to be searched will include: PubMed, CINAHL, LILACS, Web of Science, Embase, Scopus and Cochrane Register of Control Trials, Cochrane Database of Systematic Reviews, *JBI Database of Systematic Reviews and Implementation Reports*, Evidence-informed Policy and Practice (EPPI-Centre), and Epistemonikos.

The search for unpublished studies will include: ProQuest Dissertations and Theses, Google Scholar, Networked Digital Library of Theses and Dissertations and Catálogo de Teses e Dissertações- CAPES.

The search for information from relevant organizations, manuals and guidelines will include: World Health Organization, Joint Commission International (JCI), Agency for Healthcare Research and Quality (AHRQ), Australasian Emergency Care (AUEC), Manchester Triage System, Emergency Severity Index, and the Canadian Association of Emergency Physicians (CAEP).

Study selection

Following the search, all identified citations will be collated and uploaded into bibliographic software or citation management system and duplicates removed. Titles and abstracts will then be screened by two independent reviewers for assessment against the inclusion criteria for the review. Studies that may meet the inclusion criteria will be retrieved in full and their details imported into JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI) (Joanna Briggs Institute, Adelaide, Australia). The full text of selected studies will be retrieved and assessed by two independent reviewers in detail against the inclusion criteria. Full-text studies that do not meet the inclusion criteria will be excluded and reasons for exclusion will be provided in an appendix in the final systematic review report. The results of the search will be reported in full in the final report and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses for Scoping Reviews (PRISMA-ScR) flow diagram.[39] Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer.

Data extraction

Data will be extracted from papers included in the scoping review by two independent reviewers using the draft of the data extraction tool presented in Appendix II. The data extracted will include specific details about the population, concept, context, study methods and key findings relevant to the review objective. The draft data extraction tool will be modified and revised as necessary during the process of extracting data from each included study. Modifications will be detailed in the full scoping review report. Any disagreements that arise between the reviewers will be resolved through discussion among all the reviewers. Authors of papers will be contacted to request missing or additional data, where required.

Presentation of results

The extracted data will be presented in diagrammatic or tabular form in a manner that aligns with the objective of this scoping review. The tables and charts will report the bibliographic data, study data and data on the methods and indicators used to evaluate the performance of ED triage systems. A narrative summary will accompany the tabulated and/or charted results and will describe how the results relate to the reviews objective and question/s.

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Appendix I: Initial search strategy

PubMed

((((((''Triage''[Mesh]) OR (((Triage[Title/Abstract]) OR Undertriage[Title/Abstract]) OR Overtriage[Title/Abstract])) OR $triage[Title/Abstract])))) AND ((((((((''Quality Indicators, Health Care'' [Mesh]) OR ''Quality Indicators, Health Care'' [Title/Abstract])) OR ((''Quality of Health Care''[Mesh]) OR ''Quality of Health Care''[Title/Abstract])))) AND (((''Emergency Service, Hospital''[Mesh]) OR ''Emergency Service, Hospital''[Title/Abstract]))

CINAHL

((((MH ''Triage'') OR (AB ''Triage'')) AND (((MH ''Quality of Health Care'') OR (AB ''Quality of Health Care'')) OR (AB ''Quality Indicators, Health Care))) AND ((MH ''Emergency Medical Services'') OR (AB ''Emergency Medical Services'') OR (''Emergency Service, Hospital'')))

Appendix II: Data extraction instrument

A. Bibliographic data (authors, title, journal, year, volume, number, pages, publisher)	
B. Publication data	
Type of publication (for example: report of empirical research, report of theoretical research, document of an organization, experience report, editorial)	
Objective(s)	
Year of the triage evaluation (if applicable)	
Origin/Country of origin (where the evaluation was conducted, if applicable)	
C. Data on the triage protocol	
Triage protocol involved	
Professionals involved in the triage protocol	
Patients involved in the triage protocol	
Triage flow	
Triage outcomes	
D. Data on the evaluation of the triage performance	
Aim/Purpose	
Design adopted for evaluation	
Framework/Matrix details	
Indicator considered	
Analysis conducted	
Main results	
Study/Report limitation stated by the author(s)	
Reviewers' comments	