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Quality Evaluation of Prehospital Care: A Literature Review

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ABSTRACT

This literature review aimed to trace, examine, and describe the literature on indicators used to evaluate the quality of prehospital care.

Traditionally, the performance of ambulance services and the quality of prehospital care have been measured using simple indicators, such as response time intervals, often based on low-level evidence. However, the discipline of paramedicine has evolved significantly over the last few decades. Consequently, the validity of utilizing such measures as holistic quality of prehospital care indicators (QIs) has been challenged. There is a growing interest in identifying new and more significant ways to evaluate the quality of prehospital care.

This literature review examined the concepts of prehospital care quality and QIs developed for ambulance services. The review considered primary and secondary research across all paradigms and utilizing any methods, as well as text and opinion. The Joanna Briggs Institute methodology for conducting scoping reviews was employed. Separate searches were conducted for each review question, including one addressing the definition of prehospital care quality. The following databases were searched: PubMed, CINAHL, Embase, Scopus, Cochrane Library, and Web of Science. Searches were limited to publications from January 1, 2000, to the search date (April 16, 2017). Non-English articles were excluded.

Nine articles were included in the review. These originated mostly from England (n = 3, 33.3%) and the USA (n = 3, 33.3%). Only one study specifically aimed at defining prehospital care quality. Five articles (55.5%) described attributes specific to prehospital care quality, and four (44.4%) articles considered generic healthcare quality attributes to be applicable to the prehospital context.

Historically, the quality and performance of prehospital emergency care (PEC) have been assessed largely based on surrogate, non-clinical endpoints such as response time intervals or other crude measures of care (e.g., stakeholder satisfaction). However, advances in Emergency Medical Services (EMS) systems and services worldwide have seen their scope and reach continue to expand. This has necessitated the implementation of novel performance measures or evaluations to complement this growth. Significant progress has been made in this area, largely in the form of the development of evidence-informed quality indicators (QIs) of PEC.

While there is a paucity of research specifically defining prehospital care quality, the attributes of generic healthcare quality definitions appear to be accepted and applicable to the prehospital context. There is a growing interest in developing prehospital care QIs. However, there is a need for validation of existing QIs and de novo development addressing broader aspects of prehospital care.

Keywords: *Ambulance; emergency medical services; healthcare quality assessment; prehospital care; quality indicators*

Introduction:

The definition of prehospital care encompasses all care provided by any service to a patient before their arrival at a hospital. For the purpose of this literature review, prehospital care specifically refers to the care that ambulance services provide to patients with urgent or emergency care needs. This care begins when someone calls the ambulance service and concludes upon the patient's transport to a hospital. In some instances, all necessary patient care can be delivered before transport, eliminating the need for hospitalization. Historically, ambulance services were established to ensure the swift transport of the sick and injured to medical facilities. Timely and safe conveyance of patients with urgent and emergency care needs to an appropriate healthcare facility remains a central function of modern ambulance services. However, the scope and coverage of prehospital care provided by ambulance services have evolved significantly over the last few decades.¹⁻⁵ The primary drivers of these developments have been the professionalization of the paramedic industry, improvements in the integration of ambulance services within the broader healthcare system, and increasing demand due to various factors, including an aging and growing population and the expanding burden of chronic disease. Despite this growth, the relatively recent formation of the paramedicine profession and the consequent limited research capacity, coupled with the complexities of conducting data collection in the prehospital emergency care setting, have resulted in a scarcity of discipline-specific, scientific evidence.⁶⁻¹² Consequently, the performance and quality of ambulance services have traditionally been measured using simplistic indicators based on little to no evidence, such as response time intervals.^{7, 9, 13} These basic measures have dominated ambulance service performance reports because they are easily obtained and readily understood by both the public and policymakers.^{7, 13-15} Although shorter prehospital time intervals may be associated with better outcomes in certain time-critical patient cohorts,^{16, 17} the validity of response time as a holistic prehospital care quality indicator (QI) has been challenged.^{18, 19} As a result, there is a need for, and a growing interest in, identifying new and more significant ways to measure prehospital care quality.

This scoping literature review sought to locate, examine, and describe the indicators used to measure prehospital care quality. Prior to the development of the protocol,²⁰ a preliminary search of the JBI Database of Systematic Reviews and Implementation Reports and the Cochrane Database of Systematic Reviews for previous scoping or systematic reviews on the topic was performed and yielded no results. This scoping literature review is valuable for healthcare

professionals in ambulance services involved in quality improvement programs and for researchers investigating methods for measuring ambulance service quality and performance. It forms part of a wider research project, the Indian Prehospital care quality Indicator project (IPIRE), which aims to develop and test prehospital care QIs for the Indian setting.

Problem:

Quality indicators represent an increasingly popular component of healthcare quality and performance measurement. However, little is known about the development of QIs in the PEC environment. The purpose of this study was to assess the development and characteristics of PEC-specific QIs in the literature.

Methods:

A literature review was conducted through a search of PubMed (National Center for Biotechnology Information, National Institutes of Health; Bethesda, Maryland USA); EMBase (Elsevier; Amsterdam, Netherlands); CINAHL (EBSCO Information Services; Ipswich, Massachusetts USA); Web of Science (Thomson Reuters; New York, New York USA); and the Cochrane Library (The Cochrane Collaboration; Oxford, United Kingdom). To enhance the sensitivity of the literature search, a review of grey literature and select websites was additionally performed. Articles were selected that proposed at least one PEC QI and whose aim was to discuss, analyze, or promote quality measurement in the PEC environment.

Characteristic	**No. (%) out of a total of nine articles**
Types of Research / Project	
Primary Research	2 (22.2)
Consensus Method	1 (11.1)
Mixed Qualitative Methods	1 (11.1)
Secondary Research	4 (44.4)
Literature / Systemic Review	2 (22.2)
Editorial, Focus, Perspective, Commentary, other	2 (22.2)
Governmental Sources/ Industry Report	3 (33.3)

Year of Publication	
2000 – 2004	2 (22.2)
2005 – 2009	2 (22.2)
2010 – 2014	2 (22.2)
2015 – 2017	3 (33.3)
Country of Origin:	
England	3 (33.3)
USA	3 (33.3)
Australia	2 (22.2)
Norway	1 (11.1)
International	1 (11.1)
EMS System	
Paramedic	8 (88.9)
Physician	1 (11.1)
Attributes of Prehospital Care Quality:	
Explicitly Stated	5 (55.5)

Search Strategy:

This literature review employed a three-step search strategy to identify both published and unpublished studies relevant to the research questions. Initially, a limited search was conducted in PubMed and CINAHL, followed by an analysis of the text words within the titles and abstracts, as well as the index terms assigned to the articles. Subsequently, a comprehensive search utilizing all identified keywords and index terms was performed across the following databases: PubMed, CINAHL, Embase, Scopus, Cochrane Library, and Web of Science. Finally, the reference lists of all selected reports and articles were manually searched for additional pertinent studies. Due to the reviewers' linguistic capabilities and constraints related to time and budget, only English language publications were included. The search timeframe was limited to publications from January 1, 2000, to April 16, 2017, as the widespread adoption of quality improvement methodologies across healthcare sectors has predominantly occurred in the 21st century.²¹ To augment these database searches, grey literature was explored through ProQuest Dissertations and Theses, OpenThesis, and the Networked Digital Library of Theses and Dissertations.

Furthermore, experts in the field were consulted, and a manual search was conducted on the websites of the following professional organizations, accrediting bodies, and governmental agencies:

- Agency for Healthcare Research and Quality (AHRQ)
- National Quality Measures Clearinghouse (NQMC)²²
- Association of Ambulance Chief Executives (AACE)²³
- Australian Commission for Safety and Quality in Health Care (ACSQHC)²⁴
- Australian Government Productivity Commission²⁵
- Care Quality Commission (CQC)
- Council of Ambulance Authorities (CAA)
- International Association of Fire Fighters (IAFF)²⁶
- National Highway Traffic Safety Administration (NHTSA) Office of Emergency Medical Services (EMS)²⁷
- National Health Service (NHS) India

Results:

The majority of the identified research (33.3%) was published between 2015 and 2017. Regarding the type of research, 2.2% was primary research, and 44.4% was secondary research. Based on the emergency medical services (EMS) system focus, 88.9% of the research pertained to paramedic-led systems, while 11.1% focused on physician-led systems.

Conclusion:

Overall, there is significant interest in understanding and developing quality measurement in prehospital emergency care (PEC). However, greater attention to the specific details and reporting of quality indicators (QIs) is necessary to enhance the extrapolability and generalizability of research in this area. This literature review serves as a foundational base for future research focused on the development of quality indicators for the evaluation of prehospital emergency care.

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