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Research review

Trauma registry implementation in low- and middle-income countries: challenges and opportunities

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ABSTRACT

Background: Trauma registries are an essential part of trauma quality improvement programs aimed at decreasing morbidity and mortality in high-income countries. In low- and middle-income countries (LMICs), where the burden of injury is disproportionately high, hospitals have faced challenges in adapting trauma registry models implemented in high-income countries. We analyze the barriers to trauma registry implementation in LMICs to inform development of sustainable models in resource-constrained settings.

Materials and methods: A structured review of published literature was performed. Relevant abstracts were identified using the PubMed, Embase, and CINAHL databases. The search terms included were: "implement registry," "trauma registry," "wounds and injuries," and "injury registry" combined with "Africa," "Asia," "low and middle income countries," "LMIC," and "developing countries." Articles describing challenges of trauma registry implementation were reviewed in full and details were abstracted.

Results: Twenty-eight articles addressed challenges of implementing trauma registries. Data quality (18), lack of resources (6), insufficient prehospital care (3), and difficulty with administrative duties and hospital organization (2) were reported as the most significant barriers to successful implementation. Solutions to the identified barriers were proposed by 15 articles. All 28 studies acknowledged that the presence of at least one local trauma registry improved injury surveillance and promoted better patient outcomes.

Conclusions: Many LMICs face unique challenges to implementation that must be overcome to create sustainable trauma databases. Understanding these barriers and taking steps to evaluate the effectiveness of proposed solutions may further improve trauma care to address the high burden in these settings.

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Introduction

Injury remains a major cause of death and disability worldwide.[1] Based on the 2015 Global Burden of Disease Study, injury was the cause of approximately 4.7 million deaths globally, of which a little more than half occurred in low- and middle-income countries (LMICs). Road injuries alone are the ninth leading cause of disability-adjusted life years globally, ahead of HIV/AIDS (10th), malaria (14th), and tuberculosis (18th).[2] While high-income countries (HICs) have considerably improved the quality of trauma care, the burden of injury continues to increase in LMICs.[3]

In an attempt to reduce the number of trauma-related deaths in LMICs and replicate the success seen in other parts of the world, the World Health Organization published a manual focusing on trauma care quality improvement (QI) in 2009.[4] This publication has emphasized the importance of developing hospital trauma care systems and evaluating the quality of care through the implementation of quality assessment programs. Chief among these quality assessment tools is the trauma registry. A trauma registry is defined as a disease-specific collection composed of a file of uniform data elements that describe the injury event, demographics, prehospital information, diagnosis, care, outcomes, and costs of treatment for injured patients.[4] Trauma registries have been an essential component of trauma systems in HICs for decades, with evidence supporting their benefits.[5] They have been critical for improving existing record-keeping practices and are frequently used to demonstrate the benefits of trauma systems, as demonstrated by the studies used in this analysis.

With the growing body of evidence in support of trauma registries, their implementation is slowly increasing in LMICs.[4] To aid in the development of trauma registries in low-resource settings, it is essential to understand the barriers to implementation and context-appropriate solutions that may facilitate success. There are few resources available that provide comprehensive insight into the unique challenges that LMICs face. The absence of a systematic understanding of the barriers to trauma registry implementation in LMICs limits potential improvement.

An analysis of the challenges of trauma registry implementation could inform data collection feasibility, which may promote the development of new and improved models of care. The aim of this review is to provide a comprehensive description of challenges faced in the implementation of trauma registries in resource-poor settings and potential solutions to consider in future initiatives.

Methods

Search strategy

A structured literature review was performed, and relevant abstracts were identified by searching the PubMed, Embase, and CINAHL databases. After a final list of studies was compiled from all databases, a total of 13 duplicates between the three databases were identified and removed. The search terms queried were: “implement registry,” “trauma registry,” “wounds and injuries,” and “injury registry” combined with “Africa,” “Asia,” “low and middle income countries,” “LMIC,” and “developing countries.” Specific regional search terms for Africa and Asia were used, as countries in these particular regions have reported past progress in injury surveillance; thus, there is a greater likelihood that studies related to implementation of trauma registries in these regions have been published. Specific search terms pertaining to South and Central America did not yield discernible results; the published studies from these regions were captured by more general search terms and were included in the final analysis. A Medical Subject Headings search was performed in PubMed by combining the above terms. A subject heading search combining the above terms was performed in Embase. The outcome of interest was any description of a specific challenge faced by LMICs in the implementation of a trauma registry.

Inclusion and exclusion criteria

HICs are defined by the World Bank as countries with a per capita gross national income (GNI) of US dollars (USD) 12,496 or above.[6] LMICs include both low-income countries (per capita GNI of USD 1,025 or less) and lower middle-income countries (per capita GNI of USD 1,026-4,035).[6] A “trauma registry” is defined by the American Trauma Society as “a collection of data on the incidence, diagnosis, and treatment of trauma victims that should drive a performance improvement program for the care of an injured patient.”[7] All articles reporting on at least one challenge or barrier to implementation of a hospital-based trauma registry in an LMIC were included in this review. No restrictions were placed on dates of publication for inclusion. Studies were excluded if a full text was not published or did not report on trauma registries in LMICs. Review articles and studies that included an analysis of trauma registry data, but did not include an evaluation of trauma registry implementation, were also excluded.

One researcher independently screened the titles and abstracts of search results according to stated criteria. Full texts of eligible articles were reviewed and qualitative data relevant to the outcome of interest were extracted. The references of included articles were also screened for additional eligible studies as a means of ensuring robustness of the review. Studies were not excluded on the basis of study design, methodology, or data quality.

Data analysis

Qualitative findings on the barriers to implementation of trauma registries were organized into specific categories or themes for analysis: (i) issues with data quality, (ii) administrative or organizational challenges, (iii) limited resources, and (iv) inadequate prehospital care. Data quality-related issues were further defined into subcategories: (i) underreporting, (ii) incomplete or inaccurate data, and (iii) inappropriate results with existing injury-scoring tools. These categories reflect what authors of reviewed studies identified as the most significant challenge to registry implementation.

Often, multiple challenges were mentioned in a single study, making it difficult to establish which barrier(s) was/