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Status of trauma quality improvement programs in the Americas: a survey of trauma care providers

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ABSTRACT

Introduction: Global disparities in trauma care contribute to significant morbidity and mortality (M&M) in low- and middle-income countries. Implementation of quality improvement (QI) programs has been shown to be a cost-effective strategy to improve trauma care quality. In this study, we aim to characterize the trauma QI programs in a broad range of low- to high-income countries in the Americas to assess areas for targeted improvement in global trauma QI efforts.

Methods: We conducted a mixed methods survey of trauma care providers in North and South America distributed in-person at trauma care conferences and online via a secure survey platform. Responses were analyzed to observe differences across respondent country income categories.

Results: One hundred ninety-two surveys were collected, representing 21 different countries from three income strata (three lower-middle–, eleven upper-middle–, and eight high-income countries). Respondents were primarily physicians or physicians-in-training (85%). Eighty-nine percent of respondents worked at an institution where M&M conferences occurred. M&M conferences were significantly more frequent at higher income levels ($P = 0.002$), as was attending physician presence at M&M conferences (70% in high-income countries *versus* 43% in lower-middle–income countries). There were also significant differences in the structure, quality, and follow-up of M&M conferences in lower *versus* higher income countries. Sixty-three percent of respondents reported observing some kind of positive change at their institution due to M&M conferences. The survey also suggested significantly higher utilization of autopsy ($P < 0.001$) and electronic trauma registries ($P = 0.01$) at higher income levels.

Conclusions: This survey demonstrated an encouraging pattern of widespread adoption of trauma QI programs in several countries in North and South America. However, there continue to be significant disparities in the structure and function of trauma QI efforts in low- and middle-income countries in the Americas. There are several potential areas for

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development and improvement of trauma care systems, including standardization of case selection and follow-up for M&M conferences and increased use of medical literature to improve evidence-based care.

Introduction

Global disparities in the quality and availability of trauma care, and thus, the associated morbidity and mortality (M&M) attributable to injury, are well established.[1-3] In low- and middle-income countries (LMICs), these disparities are estimated to account for two million preventable deaths each year.[3] Worldwide, trauma and injury-related death and disability exceed that which is attributable to malaria, tuberculosis, and HIV/AIDS combined—the causes of mortality on which global health research and resources have customarily been focused.[2,4] Furthermore, injury disproportionately impacts LMICs, perpetuating medical and socioeconomic disparities.[5,6]

There is significant evidence to support the implementation of quality improvement (QI) programs to improve outcomes in trauma care.[7] Objectives of well-developed QI systems include the identification and examination of quality issues through M&M conferences and preventable death panels, as well as the establishment of reliable institutional recordkeeping in the form of registries and audit filters.[8] From a global health perspective, QI programs have the combined advantage of offering robust methods for addressing quality issues while allowing these efforts to be tailored to a variety of clinical, cultural, and economic contexts.

The World Health Organization (WHO) has played a critical role in the support of QI development in trauma care through the dissemination of trauma care QI guidelines. These guidelines have been implemented worldwide, including in Latin America.[8-10] The Pan-American Trauma Society (PTS) offers a 2-d course based on the Spanish translation of the WHO QI Guidebook.[11] Although these efforts are promising, their impact, as measured by the current status of implementation QI programs, is largely unknown in LMICs. A recent review of WHO QI guideline implementation revealed a few reports from Latin America; however, neither these reports nor other global reports afford a detailed view of frequency or mode of QI program implementation.[12-15]

In this study, we aimed to describe the scope and nature of QI practices in trauma care in North and South America. This was accomplished through the implementation of a conference-based survey at the PTS's 2015 Annual Congress in Santa Cruz, Bolivia and a web-based survey distributed via email through regional trauma professional listservs. The goal of this research is to provide a detailed accounting of QI practices in a sample of care providers from varying economic and sociocultural contexts to illustrate potential differences or disparities in the status of such programs. This characterization and comparison of institutional practices will serve to inform the ongoing development and systematization of QI programs in the Americas and beyond.

Methods

This cross-sectional, descriptive study was conducted online and at a 4-d regional academic trauma conference in November 2015. We distributed an anonymous, single-page questionnaire regarding trauma QI practices to health care providers of all levels of training both at the conference and via a secure online survey platform (Research Electronic Data Capture [REDCap], www.project-redcap.org). Online surveys were distributed voluntarily via email by coordinators of professional societies for trauma care providers in the Americas. Respondents were from 21 different countries in North America, South America, and the Caribbean. The represented countries included three lower-middle–income countries (L-MICs), eleven upper-middle–income countries (UMICs), and eight high-income countries (HICs), as categorized by World Bank.[16] This study and the survey instrument were approved by the University of Washington and the Universidad Peruana Cayetano Heredia ethical committees.

The questionnaire was based on the current literature and was an extension of a previous questionnaire that was used to survey participants at WHO trauma QI courses in previous years.[17] The questionnaire included questions regarding respondent demographics, hospital descriptors such as size and location, objective QI practices such as frequency of M&M conference and presence of a trauma registry, and subjective factors such as adequacy of case presentations at M&M conferences and relative validity of sources of medical information. The survey defined an M&M conference as "any meeting where complicated cases ("morbidity and mortality") are routinely reviewed". One of the 19 questions was entirely qualitative and asked the providers to state what they perceived to be the first priority in improving the use of M&M conferences and trauma registries in their context.

STATA (StataCorp. 2015, College Station, Texas) was used for data analysis including descriptive statistics on all items. Continuous variables were converted to categorical for presentation. The qualitative data were inductively coded, and the frequency of coded responses presented. When calculating X^2 for comparison of categorical variables, blank responses were excluded. Kruskal–Wallis test was used for independent variables with ordinal dependent variables. Chi goodness-of-fit test was used for comparison of categorical variables across a single population, and P-values reported reflect three-way comparison across income categories. Multiple logistic regression analysis was used to examine determinants of perceived change related to QI efforts at respondents' institutions. Model selection was performed using backward and forward stepwise logistic regression, and potential predictors entered or remained in the model using a threshold significance level of $P \leq 0.10$. Variables were also assessed for correlation.