

Types and risk factors of ambulance accidents: A scoping review

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ABSTRACT

Background: A scoping review was conducted to map out the common research focusses on ambulance accidents, their key findings and some of the major knowledge gaps in this area.

Materials and Methods: Relevant, peer-reviewed, English-language articles on land ambulance accidents were independently searched by the authors using the MEDLINE and CINAHL databases. Anecdotal reports, testimonies and stories in trade or popular magazines and other grey literature were excluded. Articles that do not directly address ambulance accidents were also excluded. Additional articles were identified from the reference lists of the selected articles and from Google search engine.

Results: From an initial yield of 879 articles, 19 articles were included. Most of these articles were published from 2001 – 2005 (5 articles, 26.3%) and 2006 – 2010 (5 articles, 26.3%). Eighteen articles (78.3%) are original articles (18 articles, 78.3%) and another one article is a review article. Most of these articles focused on (1) the types of collisions and (2) the risk factors of ambulance accidents. Nine risk factors were identified to have contributed to ambulance accidents: (1) driving in urban areas (2) driving on dry road (3) the use of lights & sirens (4) the failure to use restraints (5) driving for emergency use (6) back seating (7) at road intersection (8) driver's previous records of accidents and (9) inter-facility transfer. The two most common risk factors studied were (1) the use of lights & sirens and (2) driving at intersection.

Conclusions: Most of the above risk factors can be mapped into three categories of risk factors: task-related factors, vehicle-related factors and environment-related factors. The category of risk factors least studied is the category of driver-related factors.

KEYWORDS:

scoping review, ambulance, emergency vehicle, collision, accident

INTRODUCTION

To achieve quick responses to and from an incident site, ambulances often have to travel at high-speed using lights and sirens (L&S). Unfortunately, high-speed travel and L&S use increases the risk of ambulance accidents.^{1,5} Inevitably, this problem must be viewed with utmost seriousness as

ambulance is a dedicated vehicle that is supposed to arrest the progression of the illnesses or injuries of patients and to deliver them safely into the healing hands of healthcare providers in hospitals.

Although ambulance accidents can be of grave consequences, there is a paucity of a literature review to systematically analyze prior studies on ambulance accidents. We embarked on a scoping review on peer-reviewed publications related to ambulance accidents. The main purpose of this review is to broadly map out the key research findings on ambulance accidents.^{6,7} To conduct this review, the methodological framework by Arksey and O'Malley was adopted.⁶ Specifically, the objectives of this review were to identify (1) the common research focusses that have been conducted in the area of ambulance accidents; (2) key findings or trends reported in these studies; (3) major knowledge gaps that could be addressed in future research on ambulance accidents.

MATERIALS AND METHODS

Procedure

The procedure used in this scoping review was based on the 5-step framework by Arksey and O'Malley.⁶ These five steps are: (1) defining our research objectives or research questions; (2) identifying the relevant studies; (3) selecting studies to be included based on our inclusion and exclusion criteria; (4) charting and interpreting the data and (5) collating, summarizing, synthesizing and reporting the results.

Eligibility criteria

Only peer-reviewed articles focusing on land ambulance accidents that were published in academic journals were included in this review. Articles such as anecdotal reports, testimonies and stories published in trade or popular magazines as well as in other grey literature were excluded. Articles describing aspects of ambulance safety but do not directly address ambulance accidents; or where the main focus of the articles are not on ambulance accidents, were also excluded. Articles that merely describe air ambulance accidents (but not on land ambulances) were excluded as well. Only English-language articles were included. We did not set a limit on the publication period of our literature search. Search strategy was conducted using the methodology described by Aromataris & Riitano.⁸ The keywords and Boolean operators used included the following phrases: ambulance AND crash*, ambulance AND accident*,

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