



# The Role of Traffic Medicine in Reducing Road Traffic Accidents: Challenges and Solutions

Ameneh Marzban <sup>1, \*</sup>

<sup>1</sup> Department of Health in Disasters and Emergencies, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran

\*Corresponding Author: Department of Health in Disasters and Emergencies, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran. Email: amenemarzban@yahoo.com

Received: 14 September, 2025; Accepted: 20 December, 2025

## Abstract

**Context:** Road traffic accidents are among the leading causes of death and injury worldwide. Traffic medicine, as a relatively new field, plays a crucial role in reducing these accidents by providing preventive measures, accurate assessments, and effective management of road traffic injuries.

**Evidence Acquisition:** This review article explores the role of traffic medicine in reducing road traffic accidents by analyzing relevant studies, articles, and reports. The focus is on identifying challenges and proposing solutions for effective implementation.

**Results:** Key challenges include a lack of public awareness, inadequate emergency medical equipment, and insufficient specialized training. Solutions such as increasing public awareness, ensuring the provision of emergency medical equipment, and conducting specialized training courses are discussed.

**Conclusions:** Traffic medicine has a significant impact on reducing road traffic accidents and improving road safety. Comprehensive planning, continuous education, and collaboration with relevant organizations are essential for effective implementation.

**Keywords:** Traffic Medicine, Road Traffic Accidents, Road Safety, Emergency Medical Equipment, Specialized Training, Public Awareness

## 1. Context

Road traffic accidents are a major global concern, causing numerous deaths and injuries annually (1, 2). The World Health Organization (WHO) reports that approximately 1.35 million people die each year as a result of road traffic accidents, with millions more suffering serious injuries (3). Traffic medicine, a relatively new field, encompasses preventive, diagnostic, therapeutic, and rehabilitative measures aimed at reducing the incidence and severity of road traffic accidents (4). This article reviews the role of traffic medicine in reducing road traffic accidents, highlights the challenges, and proposes solutions for effective implementation.

## 2. Evidence Acquisition

This review article is based on a comprehensive analysis of existing literature on traffic medicine and its impact on road safety. A systematic search was conducted using databases such as PubMed, Google Scholar, and Scopus to identify relevant studies, articles, and reports. Keywords used in the search included "traffic medicine", "road traffic accidents", "road safety", "emergency medical equipment", "specialized training", and "public awareness". The inclusion criteria focused on studies and reports published in the last ten years. Data extraction and analysis were performed to identify key challenges and propose solutions.

## 3. Results

### 3.1. Challenges in Traffic Medicine

### 3.1.1. Lack of Public Awareness

One of the primary challenges in traffic medicine is the lack of public awareness about its importance and role in reducing road traffic accidents (5). Many individuals are unaware of the preventive measures and safety practices that can significantly reduce the risk of accidents (6). This lack of awareness often leads to inadequate adoption of safety measures and continued high rates of accidents (7, 8).

### 3.1.2. Inadequate Emergency Medical Equipment

Another critical challenge is the insufficient availability of emergency medical equipment in accident-prone areas. Essential emergency medical equipment, such as first aid kits, respiratory devices, and rescue tools, is often lacking, which hinders timely and effective response to road traffic accidents (5). The absence of these tools can result in increased fatalities and prolonged recovery times for injured individuals.

### 3.1.3. Insufficient Specialized Training

Specialized training in traffic medicine is crucial for healthcare professionals, first responders, and traffic enforcement officers (2, 9). However, there is a significant gap in the availability and quality of training programs. Many healthcare professionals and first responders lack the necessary skills and knowledge to manage road traffic injuries effectively. This gap in training can lead to suboptimal care and increased morbidity and mortality rates (10).

## 3.2. Proposed Solutions

### 3.2.1. Increasing Public Awareness

Increasing public awareness about the importance of traffic medicine and road safety is essential (1). Public awareness campaigns, distribution of educational materials, and the use of media can help inform individuals about preventive measures and safety practices (11). These efforts can lead to better adoption of safety measures and a reduction in the number of road traffic accidents (12).

### 3.2.2. Provision of Emergency Medical Equipment

Ensuring the availability of emergency medical equipment in accident-prone areas is crucial for effective response to road traffic accidents (13, 14). Governments and relevant organizations should invest in equipping roads and high-traffic areas with first aid

kits, respiratory devices, and rescue tools. Regular maintenance and inspection of this equipment are also necessary to ensure its functionality during emergencies (15).

### 3.2.3. Conducting Specialized Training Courses

Specialized training courses in traffic medicine should be conducted for healthcare professionals, first responders, and traffic enforcement officers (16). These courses should include practical training and simulations to equip individuals with the skills and knowledge required to manage road traffic injuries effectively. Collaboration with academic institutions and professional organizations can help develop and deliver high-quality training programs (17, 18).

## 4. Conclusions

The findings of this review highlight the significant impact of traffic medicine on reducing road traffic accidents and improving road safety. By addressing the challenges of public awareness, emergency medical equipment, and specialized training, traffic medicine can play a vital role in preventing accidents and minimizing their consequences. The proposed solutions emphasize the need for comprehensive planning, continuous education, and collaboration with relevant organizations to achieve effective implementation.

Traffic medicine also contributes to post-accident care by providing timely and appropriate medical interventions, which can improve the prognosis and recovery of injured individuals. The integration of traffic medicine into national road safety strategies can enhance overall road safety and reduce the burden of road traffic accidents on healthcare systems.

Traffic medicine has a critical role in reducing road traffic accidents and enhancing road safety. Addressing the challenges of public awareness, emergency medical equipment, and specialized training is essential for effective implementation. Comprehensive planning, continuous education, and collaboration with relevant organizations are key to the success of traffic medicine in achieving its goals. Future research should focus on evaluating the effectiveness of traffic medicine interventions and exploring innovative approaches to further improve road safety.

## Acknowledgements

The author would like to thank all researchers and professionals who have contributed to the field of traffic medicine and road safety. Special thanks to the

institutions and organizations that provided access to relevant literature and data for this review.

## Footnotes

**AI Use Disclosure:** The authors declare that no generative AI tools were used in the creation of this article.

**Authors' Contribution:** All stages were conducted by A. M.

**Conflict of Interests Statement:** The author declares no conflict of interests.

**Data Availability:** All data generated or analyzed during this study will be available from the corresponding author on reasonable request.

**Funding/Support:** This study was supported in part by the author.

## References

- Fisa R, Musukuma M, Sampa M, Musonda P, Young T. Effects of interventions for preventing road traffic crashes: an overview of systematic reviews. *Bmc Public Health*. 2022;**22**(1):513. [PubMed ID: 35296294]. [PubMed Central ID: PMC8925136]. <https://doi.org/10.1186/s12889-021-12253-y>.
- Wegman F. The future of road safety: A worldwide perspective. *IATSS Res*. 2017;**40**(2):66-71. <https://doi.org/10.1016/j.iatssr.2016.05.003>.
- Staton C, Vissoci J, Gong E, Toomey N, Wafula R, Abdelgadir J, et al. Road traffic injury prevention initiatives: a systematic review and metasummary of effectiveness in low and middle income countries. *PloS One*. 2016;**11**(1). e0144971. [PubMed ID: 26735918]. [PubMed Central ID: PMC4703343]. <https://doi.org/10.1371/journal.pone.0144971>.
- Tavakkoli M, Torkashvand-Khah Z, Fink G, Takian A, Kuenzli N, de Savigny D, et al. Evidence from the decade of action for road safety: a systematic review of the effectiveness of interventions in low and middle-income countries. *Public Health Rev*. 2022;**43**:1604499. [PubMed ID: 35296113]. [PubMed Central ID: PMC8900064]. <https://doi.org/10.3389/phrs.2022.1604499>.
- Ahmed SK, Mohammed MG, Abdulqadir SO, El-Kader RGA, El-Shall NA, Chandran D, et al. Road traffic accidental injuries and deaths: A neglected global health issue. *Health Sci Rep*. 2023;**6**(5). e1240. [PubMed ID: 37152220]. [PubMed Central ID: PMC10154805]. <https://doi.org/10.1002/hsr2.1240>.
- Razzak JA, Bhatti J, Wright K, Nyirenda M, Tahir MR, Hyder AA. Improvement in trauma care for road traffic injuries: an assessment of the effect on mortality in low-income and middle-income countries. *Lancet*. 2022;**400**(10348):329-36. [PubMed ID: 35779549]. [https://doi.org/10.1016/S0140-6736\(22\)00887-X](https://doi.org/10.1016/S0140-6736(22)00887-X).
- Haghani M, Behnood A, Dixit V, Oviedo-Trespalacios O. Road safety research in the context of low-and middle-income countries: Macro-scale literature analyses, trends, knowledge gaps and challenges. *Safety Sci*. 2022;**146**:105513. <https://doi.org/10.1016/j.ssci.2021.105513>.
- Digambiro RA, Indrawan R, Maemunah S, Sukardiman T. The Impact of Technological Systems on Initial Medical Interventions for Reducing Mortality Rates in Toll Road Traffic Accidents: Literature Review. *Adv Transportat Logistics Res*. 2023;**6**:1123-34.
- World Health Organization. *Global status report on road safety 2013: supporting a decade of action: summary*. Geneva, Switzerland: World Health Organization; 2013. Available from: [https://iris.who.int/bitstream/handle/10665/78256/9789241564564\\_eng.pdf](https://iris.who.int/bitstream/handle/10665/78256/9789241564564_eng.pdf).
- Rosen HE, Bari I, Paichadze N, Peden M, Khayesi M, Monclús J, et al. *Global road safety 2010-18: an analysis of global status reports*. 2022.
- Al Turki S. Traffic medicine in Saudi Arabia, from prevention to rehabilitation. *J Local Global Health Sci*. 2015;**2015**(2):97. <https://doi.org/10.5339/jlghs.2015.itma.97>.
- Dandona R, Kumar GA, Gururaj G, James S, Chakma JK, Thakur J, et al. Mortality due to road injuries in the states of India: the Global Burden of Disease Study 1990-2017. *Lancet Public Health*. 2020;**5**(2):e86-98. [PubMed ID: 31879251]. [https://doi.org/10.1016/S2468-2667\(19\)30246-4](https://doi.org/10.1016/S2468-2667(19)30246-4).
- Mosadeghrad AM, Gebru AA, Sari AA, Getu MA. Emergency medical services in Ethiopia: Drivers, challenges and opportunities. *Hum Antibodies*. 2019;**27**(S1):33-41. [PubMed ID: 30958339]. <https://doi.org/10.3233/HAB-190368>.
- Perkins D, Brophy H, McGregor IS, O'Brien P, Quilter J, McNamara L, et al. Medicinal cannabis and driving: the intersection of health and road safety policy. *Int J Drug Policy*. 2021;**97**:103307. [PubMed ID: 34107448]. <https://doi.org/10.1016/j.drugpo.2021.103307>.
- Sakran JV, Greer SE, Werlin E, McCunn M. Care of the injured worldwide: trauma still the neglected disease of modern society. *Scandinavian J Trauma, Resuscit Emerg Med*. 2012;**20**:1-6. [PubMed ID: 22980446]. [PubMed Central ID: PMC3518175]. <https://doi.org/10.1186/1757-7241-20-64>.
- James SL, Lucchesi LR, Bisignano C, Castle CD, Dingels ZV, Fox JT, et al. Morbidity and mortality from road injuries: results from the Global Burden of Disease Study 2017. *Inj Prev*. 2020;**26**(Suppl 2):i46-56. [PubMed ID: 32989005]. [PubMed Central ID: PMC7571342]. <https://doi.org/10.1136/injuryprev-2019-043302corri>.
- Haagsma JA, Graetz N, Bolliger I, Naghavi M, Higashi H, Mullany EC, et al. The global burden of injury: incidence, mortality, disability-adjusted life years and time trends from the Global Burden of Disease study 2013. *Inj Prev*. 2016;**22**(1):3-18. [PubMed ID: 26635210]. [PubMed Central ID: PMC4752630]. <https://doi.org/10.1136/injuryprev-2015-041616>.
- Bourdeau M, Guibert N, Fort E, Boulogne S, Lagarde E, Charbotel B. Medicine consumptions and occupational road risk. *Accident Analysis Preven*. 2021;**158**:106202. [PubMed ID: 34051434]. <https://doi.org/10.1016/j.aap.2021.106202>.