Emergency care accessibility for road accidents victims: a review

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Abstract

Road traffic accident has become a public health concern. More than 80% injury-related deaths occurred in low-middle income countries (LMICs). Despite its importance, emergency care accessibility for road crash victims is still questionable. This study aims to review emergency care accessibility from approachability, acceptability, availability, affordability, and appropriateness dimensions for crash victims. This is a scoping review with literatures extracted from ScienceDirect, ProQuest, and Scopus. Articles analyzed using PCC (Problem/Population, Concept, Context) of scoping review. 1544 articles identified from databases of which 81 are relevant for full-text screening. The final 12 articles were eligible to be reviewed. Although emergency care is available in most areas, its existence was not well-known. Victims and helpers are treated unfairly in emergency care. Emergency care system also lacks clear coordination and it does not give appropriate treatment in timely manner. There was little evidence of how accessible emergency care to crash victims. Most studies only examined the availability of emergency care without comparing its actual utilization and other determinants impacting its accessibility. Future study should aim to assess approachability, acceptability, affordability, and appropriateness of emergency care. Strengthening emergency care from all dimensions is important to ensure its accessibility.

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Key words: emergency care management; health service accessibility; road accidents.

Conflict of interest: the authors declare no conflict of interest.

Ethics approval and consent to participate: not applicable.

Patient consent for publication: not applicable.

Availability of data and materials: all data underlying the findings are fully available.

Received for publication: 15 February 2023.
Accepted for publication: 19 April 2023.

Emergency Care Journal 2023; 19:11257
doi:10.4081/ecj.2023.11257

Introduction

The scope of public health issues has grown wider in the past decades. Road traffic accidents, along with infectious and non-communicable diseases, has become public health concerns because of its burden. Traffic accident or road crash is a mishap involving at least one vehicle on the road which may lead to injury or death and loss of property.[1] Road traffic accidents contributed to 1.35 million deaths in 2016, with stagnant death rate per 100,000 population since the last 15 years.[2] Still, traffic injuries are recognized as number 1 leading killer among children and young adult age 5-29 years.[2]

Study in Mediterranean Basin found different risks of road traffic injuries based on gender, age, and type of transport.[3] Drunk driving and lack of driving experience as well as lighting condition were associated with road traffic accidents.[4] Vehicle-related risk factors of traffic accident included unsafe car modifications and no safety equipment.[5] Economic burden of traffic accidents can be measured through loss of productivity caused by accident-related injuries and deaths. The estimated macroeconomic burden attributable to traffic accidents reached $1.8 trillion in 2015-30.[6] Average DALYs due to road accidents reached 1,364,000 between 2010 and 2020 in Malawi.[7] Average working years lost because of road traffic injuries were approximately 30 years with $16.8 million estimated lost output from its mortality, worth 1.0% of Bhutan Gross Domestic Product (GDP).[8] More than 80% injury-related deaths happened in low and middle income countries (LMICs) with potential benefit of reducing mortality rates due to injuries ranged from $245-$261 billion.[9]

Considering its massive impacts, United Nations (UN) commanded member states to improve road safety through Global Plan for the Decade of Action for Road Safety 2011-2020.[10] This includes five pillars, covering road safety management from roads to users' perspectives and post-crash response. This agenda is still a priority in Sustainable Development Goals (SDGs) which should be accomplished in 2030. Meanwhile, health accessibility issue regarding road traffic accidents is rising as crucial predictor of injury-related mortality and morbidity.[11] Emergency care should be accessible to decrease injuries and deaths.[12] Although emergency services such as toll free numbers and ambulance were available, its utilization was lacking.[13] This reflects the issue of emergency care accessibility which leads to lack of utilization by crash victims. Accessibility is influenced by affordability, physical accessibility and acceptability of services as well as merely adequacy of supply.[14] Other study defined accessibility as the opportunity to get health care services fulfilled including five dimensions: i) approachability; ii) acceptability; iii) availability and accommodation; iv) affordability; and v) appropriateness.[15] Approachability

defines how people can recognize services, acceptability describes cultural and social norms of the acceptance of services, availability and accommodation reflects how services can be reached physically and timely manner, affordability explained the economic capacity to access services, and appropriateness relates to how client needs and provided services fit.[15]

Only few studies examined emergency care accessibility concerning road traffic victims. This review aims to evaluate health accessibility of emergency care specifically in road traffic injuries cases based on five dimensions.[15] This will allow practitioners and policy makers to analyze potential strategies for strengthening health accessibility for road crash victims.

Materials and Methods

This study is a scoping review with relevant literatures extracted from databases: ScienceDirect, ProQuest, and Scopus. Researchers combined search terms including road traffic accident, road traffic injury, emergency care, trauma care, and accessibility or access. Included studies were published in the last 10 years (2012-2022), written in English, explained accessibility of emergency care related to road traffic accidents, and classified as original article. Articles which did not specifically explain emergency care accessibility in case of road traffic victims were excluded. This study was conducted with Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). Results then screened to remove duplicates and underwent two screening phases to finally being included in the analysis (Figure 1).

Analysis was carried out with PCC (Problem/Population, Concept, Context).[16] Problem explained was the accessibility of emergency care for road traffic accidents and the population was not specified into certain category. The concept was described in health care accessibility dimensions. The context of accessibility was related to sociocultural, geographical, and health care settings or management context.

Results

1,544 articles were found from 3 databases using combined keywords. After screening for duplicates, we excluded 1,468 articles from the first screening due to unmatched aim with this study. We focused on assessing the article eligibility through full-text reading and excluded 7 review articles and 62 articles without any explanation regarding road traffic accidents. 12 final articles were included to be analyzed in this study. Included studies were published during 2014-2022. Researches were conducted in several countries including India (n=3), Canada (n=1), South Africa (n=1), Kenya (n=2), Uganda (n=2), Brazil (n=1), Nigeria (n=1), and Malawi (n=1).

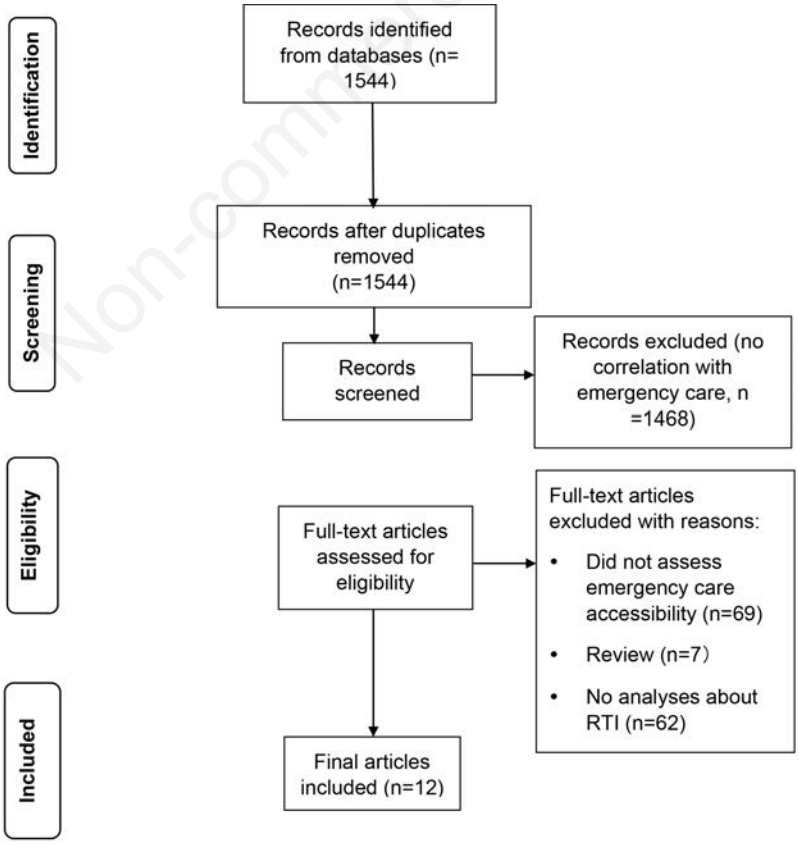

Figure 1. PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews).

Population

Most studies analyzed the emergency care accessibility by obtaining data from road traffic victims and trauma patients. Since this study did not limit population or study subjects based on certain population characteristics, one research explained trauma care access for patients who were 60 years or older[17] and a study with unspecified age group of respondents.[18]

Concept

Approachability is explained by several studies. Study in Uganda stated that patient transfer delay to emergency care was caused by inability of first responders in recognizing the danger signs and mistaken it as "cultural illness".[19] Another study in India described that almost one-fourth of crash victims did not know about emergency ambulance service.[18] In contrast, most Kenyan communities understood the medical situation, but transferred patients to private or public hospital instead of emergency care and not able to give first aid due to lack of knowledge.[20] Nevertheless, the acceptability of emergency care was explained by 2 articles. In India, the first responders usually got harassed at the emergency care,[21] while study in Kenya stated that victims would be treated faster if they dressed nicely and had financial support.[20]

Eleven articles examined the availability and accommodation of emergency care accessibility to road accidents victims. A study in Delhi, India found that 85% patients were able to reach health care facilities within 15 minutes or less.[22] The district also provided designated trauma care, but it took longer time compared to the nearest health facilities. Other research in the same area explained that auto rickshaw and police car were used more frequently than ambulance,[21] since it was usually operated to move patient in inter-health facility services and police car arrived much sooner to crash scenes. Similar situation also happened in Tamil Nadu in southern India. About 7.5% of road crash victims were transferred to hospital using ambulance, and only 3 ambulances had an attending doctor.[18] A study in Malawi explained there were no access to prehospital care for trauma patients.[23] The lack of prehospital care and first aid also showed in study located in Nigeria and Uganda.[24,25] Meanwhile in Natal, Brazil ambulance providing basic and advanced life support did not operate at night.[17] More than 70% of road analyzed in Western Cape, South Africa fell outside "Golden Hour", a one-hour-range concept of crucial time interval for crash victims to reach medical service. Study in Ontario found that only 22% of counties observed had high potential access, while only 38% severely injured patients had realized access to trauma care.[26]

Three articles defined some problems related to affordability. Studies in India, Kenya, and Uganda described how first responders usually bring patients to public hospitals cause trauma care were assumed costly and they were afraid they could not afford private hospital care.[19–21] Analyzing appropriateness dimension, lack of system and protocols was also identified. Research in India and Kenya explained the missing protocols and system structure regarding emergency care line.[20,22] Moreover, other potential organizations like fire fighters still lacked of skill and equipment so they could not provide prehospital care for trauma victims. Very few patients (20%) in Tamil Nadu were given first-aid treatment at the crash scene.[18]

Context

This study explained geographical context, health management context, and community knowledge related to emergency care accessibility for road traffic victims. 4 articles described geographical accessibility of emergency care from crash scene,[19,22,26,27] 10 articles explained the health management setting for emergency care,[17–20,22,22–25,28] and community knowledge was defined by 2 studies.[18,20]

Discussion

Emergency care access to crash victims is a complex issue. Lack of information about health services was reported in LMICs and HICs as a barrier to access care.[29] Articles analyzed in this study describe emergency care as "less known",[18,20] reflecting the issue of health literacy regarding emergency care, while people in Uganda misinterpreted the danger sign after crash as cultural illness.[19] Emergency services and system should be made known to society so they know how to present crash victims to emergency care using ambulance or other facilities. To be able to do so, the clear line of emergency care system is crucial. Studies showed that most patients were taken to hospitals using taxi, police cars, and other vehicles as they arrived sooner than ambulance.[21,24,28] Limited ambulance service and health professionals for victims with untrained first responders will be deadly, as crash victims usually need first aid within the golden hour. Bystanders were willing to give first aid but they lacked of skill and equipment.[20] In Ghana, people tended to give first aid but only less than half of them were trained.[30] Police officers, fire fighters, and drivers are potential to be trained to give first aid,[23] as some studies had also demonstrated the efficacy of first aid training.[31,32]

Acceptability reflects how emergency care and professional norms can fulfill needs from different culture and social norms.[15] In Kenya, victims were more likely to be treated faster if they dressed nicely and have financial support, indicating the issue of professional norms by health providers. First responders sometimes got harassed at emergency care and accused as the cause of collision by policeman to extort money.[21] The forced interaction between police and bystanders made them hesitate to help. Medical professionals were sometimes uncertain to help because they avoid being involved in medicolegal process.[33] This showed the issue of professional norms in providing care for emergency patients. Explaining medicolegal aspects thoroughly to helpers and health professionals is necessary as well as ensuring their safety after treating crash victims. Available services allow population to have access to health care.[14] Emergency care including prehospital care and ambulance service is available in certain areas, but having barriers such as the absence of ambulance at night[17], lack of physicians at certain areas,[18,24] and out of golden hour zone location.[25,27] Contrastingly, some areas only had limited access to prehospital care or no access at all such as in Malawi and Uganda,[19,23] making patients seek services from other facilities before coming to emergency care.[19] This also happened in Hanoi where victims of road crashes occurred in north-south main roads could not easily access trauma care.[34] In low and low-middle income countries, out of hospital emergency care were usually lack of appropriate transportation like ambulance.[35] The result reflects variability of emergency care availability in many areas, thus, showing the inequity access for crash victims.

Financial barriers to access emergency care affect its utilization.[14] All articles describing affordability dimension stated that emergency care was costly, and they worried of not affording the medical cost if they bring victims to hospitals.[19–21] The opportunity cost of emergency care was also considered. As they should go to hospitals, leaving their job behind was something disturbing.[19] Family with lower income is more likely to delay seeking medical care.[36] Study in Nigeria found that patients who were poor experienced humiliating experience.[37] Nevertheless, road accidents were the leading cause of injury with prevalence of catastrophic health expenditure reaching 22%.[38] This illustrates the need of financial support for crash victims coming from lower economic status by

strengthening health insurance scheme.

Even if the victims had access from four dimensions discussed, appropriateness regarding emergency care is still uncertain. Emergency care lacks of clear guidelines and systems that patients take longer time to receive care,[20,22] illustrating problems in coordination. Very few patients had first aid at the crash scene[18] due to shortness of health professionals, and only few victims were transported using ambulance. Meanwhile, first aid treatment given by trained provider higher the chance to recover 1.28 times.[39]

Emergency care accessibility is not simply defined by its availability.[26] Providing emergency care for crash victims requires effort to strengthen emergency health system. Introducing emergency line service will improve approachability, and educating about medicolegal process will be necessary in acceptability term. Furthermore, health insurance is vital so that people are willing to transfer victims to hospitals. It will protect poor households from catastrophic health expenditure.[40] Increasing access to appropriate treatment by training first aid and transferring patient to health care in time will higher emergency care utilization and survival rate of victims.

Previous studies only focused on availability of emergency care while its accessibility is actually built from much more complex dimensions. Our review revealed that even though only little evidence existed about other dimensions of emergency care accessibility, these dimensions significantly affected the decision of taking victims to hospitals or other emergency care facilities. Despite being available, emergency care is sometimes non-accessible due to high cost, unavailability of health professionals, and lack of knowledge of first responders or helpers. Future study and analysis should aim to evaluate how availability should be supported by other factors which influence accessibility of emergency care. Strengthening emergency care system and taking accessibility dimensions into considerations is a must to ensure that emergency care can be utilized by road crash victims in timely manner.

Conclusions

This review highlighted the obstacles of victims accessing emergency care after being involved in road accidents. Although emergency care accessibility can be defined from five dimensions, there was little evidence on how culture and social factors influence its accessibility. While emergency care was mostly available in both LMICs and HICs, its accessibility also faced barriers from affordability perspective as some victims might not have any medical insurance but needed appropriate treatment. Moreover, some emergency care also experienced shortness of health professionals which delayed the treatment to patients. This might lower the chance of survival and recovery, thus, increase the risk of fatality and morbidity due to road crashes. Reinforcing emergency care system through all five dimensions is necessary, so that emergency care is accessible for road crash victims.

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