

Facilitators and barriers influencing the post-crash emergency care of road traffic injuries in district Aligarh of Uttar Pradesh

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ABSTRACT

Context: Road traffic injuries (RTIs) will become the fifth leading cause of death by 2030. It is often possible to mitigate the consequences of serious injury if victims have access to prompt, effective pre-hospital care within minutes following the crash. **Aims:** To find out the facilitators and barriers for providing post-crash emergency care in Road traffic injuries in district Aligarh. **Settings and Design:** The present study was undertaken on both the National highways (NH-91 and NH-93) and the bypass roads passing through district Aligarh of Uttar Pradesh. **Subjects and Methods:** All the individuals who met road traffic accidents (RTA) between the earmarked areas from 1st October 2018 to 30th November 2020 and reported for treatment to the selected hospitals were included in the study. **Statistical Analysis Used:** Data is presented in the form of frequency tables and percentages. **Results:** A total of 1126 patients were interviewed during the study period. Out of 1126, 937 (83.2%) were males, and 189 (16.8%) were females, with M:F ratio being 4.96:1. Six hundred sixty-two (58.8%) of the respondents identified the layperson or common man as the first person to respond at the time of the crash. 1110 (98.58%) respondents identified the layperson as the facilitator in providing post-crash emergency care, followed by police and roadside shopkeepers/dhabawalas. The role of the layperson in calling for help by utilizing the helpline numbers, suggesting a nearby health facility together with facilitating for transportation of the victim to the nearby health facility was appreciated by the majority of the respondents. An ambulance was the best available mode of transportation. Seven hundred thirty-three (65.10%) of the total respondents were aware of the toll-free number to be dialled in case of RTA. However, only 320 (43.70%) among them used this toll-free facility after meeting the crash. **Conclusion:** A layperson is the single most important facilitator for providing post-crash emergency care.

Keywords: Barrier, facilitator, national highways, post-crash emergency care, road traffic injuries

Introduction

Road traffic injuries (RTIs) are currently estimated to be the ninth leading cause of death across all age groups globally and are predicted to become the fifth leading cause of death by 2030.^[1] According to WHO, 1.35 million people worldwide died in road traffic accidents in 2016.^[2] As per the Ministry of Road Transport

and Highways, 4,67,044 road traffic accidents and 1,51,417 deaths occurred on Indian roads in 2018.^[3]

The proportion of patients who die before reaching a hospital in low-income countries is over twice that in high-income countries.^[2] It is often possible to mitigate the consequences of serious injury, including long-term morbidity or mortality, if victims have prompt, effective pre-hospital care.^[4] People in need of trauma care after a road crash are most likely to survive if they receive definitive care within the golden first hour after the crash.^[5] Many lives can be saved, and disabilities can be minimized with competent pre-hospital services at the crash scene.^[6]

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Essential pre-hospital care involves prompt communication, treatment, and transporting injured people to formal healthcare facilities.^[4] Most of these services can be provided and managed by primary care providers with minimal interventions.

Even the most sophisticated and well-equipped pre-hospital trauma care systems can do little if bystanders fail to recognize the seriousness of a situation, call for help, and provide basic care until help arrives.^[4] There are certain barriers to providing early rescue after the crash, which need to be removed. On the other hand, there are facilitators too who would help in improving post-crash emergency care. Considerable good may be accomplished by engaging these facilitators for delivering life-sustaining care (based on the primary health care measures) to severely injured people within minutes following the crash.^[4]

The present study was part of a larger project on Road Traffic Injuries and was funded by the Indian Council of Medical Research (ICMR). The objective of the present study was to find out the facilitators and barriers to providing post-crash emergency care for Road Traffic Injuries.

Subjects and Methods

The study was undertaken on two National highways: NH91 and NH93, and the connecting bypass roads of the Aligarh district of Uttar Pradesh. A stretch of 60 km on NH91 (extending from Community Health Centre (CHC), Gabhana to CHC, Akrabad) and 47 km on NH93 (extending from CHC, Sasni to CHC, Jawan) was selected for the study.

A total of eight government hospitals and two private hospitals (coded as private hospitals 01 and 02 respectively) situated between the earmarked areas were included in the study. The duration of the study was two years, from 1st October 2018 to 30th November 2020.

All the individuals who met road traffic accidents (RTAs) between the earmarked areas during the study period and reported for treatment (either on their own or brought by relatives, passers-by, ambulance, or police) to the selected hospitals were included in the study. Resource persons providing firsthand information about the RTA patients were identified at each of the centres. After initial screening, eligible patients were contacted either in the ward or the casualty. They were told the purpose of the study and were invited to participate in the study. Informed verbal consent was taken from the patients or concerned attendants or relatives, and they were assured that confidentiality would be maintained. When the condition of the patient did not permit the interview, the parents, relatives, or attendants present were interviewed. Convenience sampling was used for including the individual. The interviewer aimed to include all the individuals meeting the above criteria and wishing to participate but those who could be contacted at the health facility. Ethical approval was obtained from the Institute's Ethics Committee.

The study tool included: (i) Prestructured proforma, which was standardised, validated, and pretested by a pilot study prior to the start of the data collection and (ii) Epicollect5 mobile app.

The Operational definition of RTA used in the study was:

A collision involving at least one vehicle in motion on a public or private road, which results in at least one person being injured or killed.^[7,8]

Results

A total of 1126 patients were interviewed during the study period. The majority of the cases were reported from Jawaharlal Nehru Medical College and Hospital (JNMC) and Malkhan Singh District hospital [Table 1]. Among those interviewed, 937 (83.2%) were males, and 189 (16.8%) were females.

Socio-demographic profile

Almost three-fourths of the patients were Hindus by religion. Two-thirds of patients were married and belonged to rural backgrounds [Table 2].

Facilitators and barriers in providing early rescue within the golden hour

First person to respond at the time of crash

Six hundred sixty-two (58.8%) of the respondents identified the layperson or common man as the first person to respond at the time of the crash. Apart from the person accompanying the patient, other notable responders were police personnel and roadside shopkeepers or dhabawalas [Figure 1].

Identification of possible facilitators in providing early care after crash

An open-ended question was put to the respondents about who they consider as the possible facilitator. Six hundred eighty-three (60.66%) respondents identified the layperson as the facilitator. Additionally, 257 (22.82%) respondents also identified laypeople as possible facilitators along with relatives [Figure 2a].

A close-ended question was put to the respondents inquiring whether they considered the layperson, police, shopkeepers, and professional drivers as facilitators or not. 1110 (98.58%) respondents identified the layperson as the facilitator. Police and roadside shopkeepers/dhabawalas were also considered as facilitators by 949 (84.28%) and 848 (75.31%) of the respondents, respectively [Figure 2b].

Identification of possible facilitators who can call for help in post-crash emergency care

Respondents were inquired whether they consider the layperson, police, shopkeepers, and professional drivers as appropriate persons who can call (police/ambulance/other toll-free numbers) for help during the event of RTA and facilitate in providing early post-crash emergency care. A maximum of 1112 (98.8%)

respondents were of the opinion that a lay person could call for help by dialling various helpline numbers. Police and roadside shopkeepers/dhabawalas were also considered facilitators in this regard by a significant number of respondents [Figure 3].

Identification of possible facilitators who can recommend/suggest a nearby health facility in case of a crash

One thousand one hundred (97.7%) of the respondents were of the opinion that a layperson could definitely help by suggesting a nearby health facility at the time of need, followed by police and roadside shopkeepers/dhabawalas [Figure 4].

Identification of possible facilitators who can facilitate or arrange for transport of RTA patients to a nearby health facility

Respondents again identified a layperson as the facilitator in this regard in 1092 (97.0%) cases, followed by police and roadside shopkeepers/dhabawalas, respectively [Figure 5].

Possible barriers in providing post-crash emergency care

The majority of the respondents denied that the layperson and police may ever act as a barrier in the delivery of post-crash emergency care [Table 3].

Name of health facility	n (%)
Jawaharlal Nehru Medical College and Hospital (JNMC)	445 (39.5)
Malkhan Singh District Hospital	415 (36.9)
Pandit Deen Dayal Upadhyay Joint Hospital	17 (1.5)
CHC, Akrabad	84 (7.5)
CHC, Sasni	113 (10)
CHC, Gabhana	---
CHC, Jawan	20 (1.8)
PHC, Cherrat	---
Private Hospital 01	---
Private Hospital 02	32 (2.8)
Total Cases	1126

Socio-Demographic Characteristic	n (%)
A. Religion	
Hindu	839 (74.5)
Muslim	270 (24.0)
Total	1126
B. Marital Status	
Married	735 (65.3)
Unmarried	389 (34.5)
Separated	1 (0.1)
Widow	1 (0.1)
Total	1126
C. Residence	
Urban	364 (32.3)
Rural	762 (67.7)
Total	1126

Most adequate means of transport to reach the health facility

Six hundred eleven (54.26%) of the respondents identified the ambulance as the best available mode of transportation. Two hundred one (17.85%) of the respondents identified ambulance and private vehicles as the second most common mode of transport. The role of a private vehicle is acknowledged by many of the participants as well [Figure 6].

Knowledge and practice regarding toll-free numbers to be dialled at the time of the crash

Seven hundred thirty-three (65.10%) of the total respondents were aware of the toll-free number to be dialled in case of RTA. However, only 320 (43.70%) among them used this toll-free facility after meeting the crash [Table 4].

The study participants were put to an open-ended question regarding their knowledge of helpline or toll-free numbers,

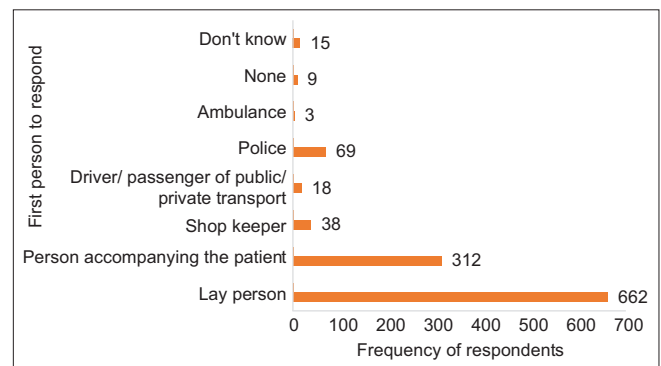


Figure 1: Identification of the first person to respond at the time of the crash

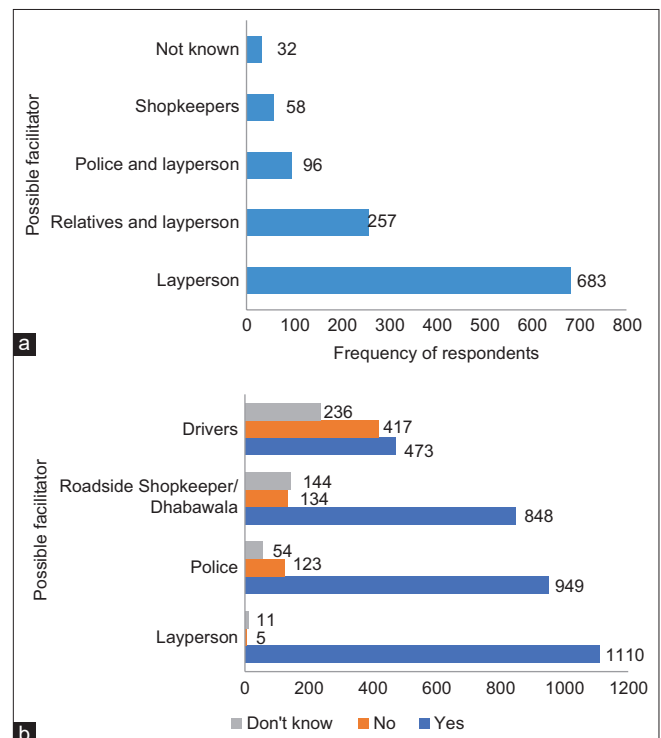


Figure 2: (a and b) Possible facilitators in providing post-crash emergency care

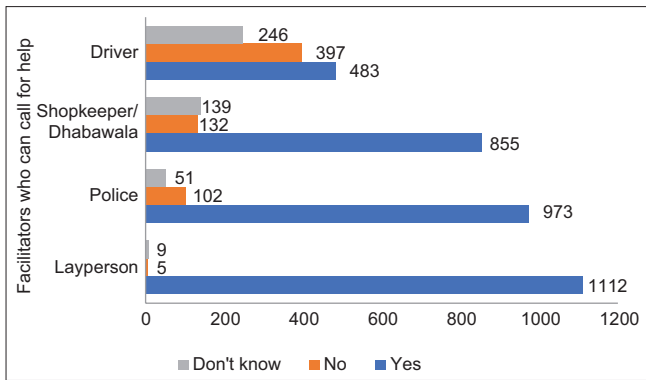


Figure 3: Identification of possible facilitators who can call for help in post-crash emergency care

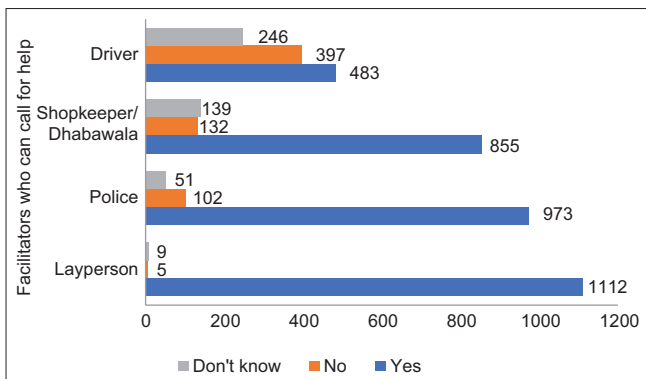


Figure 4: Possible facilitators who can recommend/suggest a nearby health facility in case of a crash

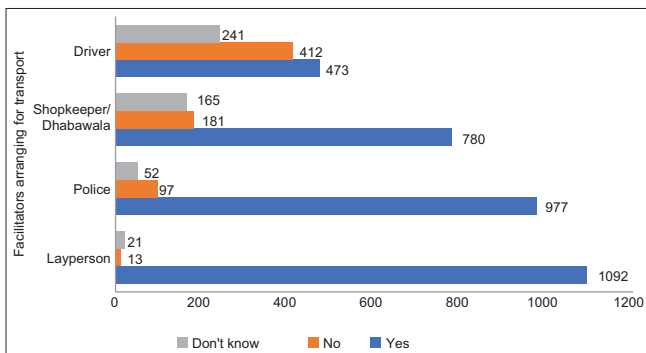


Figure 5: Possible facilitators who can facilitate or arrange for transport of RTA patients to a nearby health facility

which can be dialled for seeking help in case of RTA. Three hundred forty-six (30.73%) of the respondents knew about dialling 100 and 108 toll-free numbers. Ninety-two (8.17%) of the respondents had prior knowledge of the ambulance service of 108 only. Few of the participants had prior knowledge of 102 ambulance services and 112 emergency services.

Discussion

A total of 1126 patients were interviewed during the study period. Among those interviewed, 937 (83.2%) were males, and 189 (16.8%) were females. Almost three-fourths of the patients

Table 3: Possible barriers in providing post-crash emergency care

Possible barriers	n (%)
Can a Layperson be a Barrier	
Yes	42 (3.73)
No	1078 (95.74)
Not Known	6 (0.53)
Total	1126
Can Police be Barrier in extending PCEC	
Yes	158 (14.03)
No	941 (83.57)
Not Known	27 (2.40)
Total	1126

Table 4: Knowledge and practice regarding toll free numbers

	n (%)
Do you know any Contact No. to be dialled in RTA	
Yes	733 (65.1)
No	393 (34.9)
Total	1126
Did you/someone try these numbers:	
Yes	320 (43.70)
No	230 (31.40)
Don't Remember	183 (25.0)
Total	733

were Hindus by religion. Two-thirds of the patients were married and belonged to the rural background.

More than half of the respondents identified the layperson or common man as the first person to respond at the time of the crash. The layperson was also identified as the most important facilitator in providing early care after RTA.

Laypeople are the first responders, often reaching the crash scene sooner than anyone else.^[4,9] Laypeople arrived at the crash site within minutes of the RTIs in more than 85% of the accidents and also intervened in about 25–30% of the cases.^[10] They can be of more help to the victims if they are taught to recognize an emergency, call for help, and deliver first aid until formally trained healthcare personnel arrives to give additional care.^[4,9,11] These activities are included in primary care services and can be adapted with ease by laypeople.

The present study identifies the role of a layperson in calling for help by dialling various helpline numbers. Police and roadside shopkeepers/dhabawalas were also considered facilitators in this regard by a significant number of respondents. In a cross-sectional descriptive study in the southern district of Tumkur in India, nearly 60% of the responders had witnessed more than two emergencies in the previous six months, and 55% had actively participated in helping the injured person by calling for help and transporting the patients. However, a significant number (81.4%) of respondents reported that they did not have adequate skills

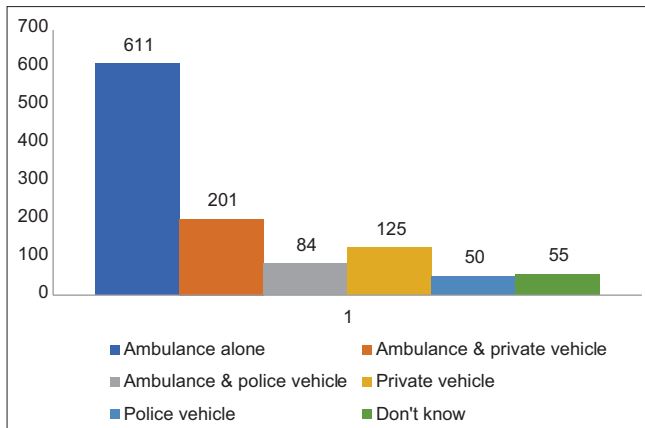


Figure 6: Most adequate means of transport to reach the health facility

to manage an emergency and were willing to acquire knowledge and skills in first aid to help victims.^[12] WHO also recommends that laypeople call the emergency services as their first action and then administer first aid to and provide security for victims at crash scenes. This can be provided by regular community-based training programmes.^[13]

Layperson further has been found to suggest a nearby health facility at the time of need and also facilitate or arrange for transporting the RTA patient to a nearby health facility. A similar role but to a lesser extent, is also expected of police and roadside shopkeepers/dhabawalas. In many instances, seriously injured people are transferred to lower-level clinics and hospitals before arriving at a facility equipped to care for them. This often leads to delayed care and losing critical time. Matching injury severity to facilities in this way allows for more effective use of limited resources, reduces delays in life-saving treatments, and has been shown to improve patient outcomes overall.^[4,14] In this regard, the first responders may be communicated properly so they know where and when to refer patients and can receive feedback about cases that they have referred.^[15] This can be done by thorough knowledge of the linkage of primary care services with secondary and tertiary care services and their delivery centres, along with the areas prone to crashes.

The role of the layperson in particular and police personnel in delivering post-crash emergency care cannot be overstated as very few of the respondents believed that they can ever be a barrier in the delivery of emergency care. However, the involvement of laypeople at the crash scene was perceived as negative by some authors. Laypeople tend to act as barriers to proper and on-time pre-hospital interventions because of their limited knowledge related to interaction at a crash scene. They may cause mistake calls over helpline numbers as they do not know how to use emergency numbers and at times even contribute to secondary injuries for the victims and can lead to a new crash.^[9,16] Many a time, the layperson is not sure what should be done first to rescue the injured person, even if they decide to intervene at the crash scene. Depending upon their level of understanding, laypeople can play the role either of facilitator or inhibitor.^[10]

An ambulance is the best available mode of transportation for the victims of RTAs. However, the use of private vehicles for transporting patients is not uncommon. Transporting a patient from the location of an acute event to a hospital is a critical element of pre-hospital care since a lack of transportation is often the major barrier preventing patients from accessing emergency care.^[4] Delay in the arrival of the ambulance (41.5%) was the most common reason cited for delay in accessing post-crash emergency care.^[17] As per WHO, most countries either have no ambulances available to travel to the scene of the crash, or, if available, the number of ambulances is grossly inadequate to meet population needs.^[2] In countries that do not have formal pre-hospital care systems, taxis, private vehicles, and police vehicles are often used to transport the patients of RTIs and maybe the only way to reach the healthcare facilities.^[4,18] Taxi was predominantly used to transport the patients in one-third of all accident cases visiting the Addis Ababa Burn Emergency and Trauma (AaBET) Emergency Department.^[19] In a cross-sectional study at Kancheepuram, it was noted that in 92.5% of the cases, the ambulance either did not reach the crash site or was not called for due to poor awareness among victims/laypeople.^[20]

Two-thirds of the total respondents were aware of the toll-free number to be dialled in case of RTA. However, only 43.70% among them utilised this toll-free facility after meeting the crash. Knowledge regarding the availability of toll-free numbers was restricted to Dial 100 and the National Ambulance Service of 108. Similar observations regarding the availability of toll-free numbers were also made by others. Awareness about emergency services meant that one phone number was available, which could be dialled for emergency attention after the crash.^[20] This shows that mere awareness about the toll-free number does not transform into the utilisation of the service. Therefore, laypeople, those attending the crash victims, and the general community need to be sensitised to increase the utilisation of this service.

Conclusion

Laypeople are the key facilitators in making post-crash management more effective. They can contribute by activating the emergency care system, and facilitating and arranging for transportation of victims in need. Training of laypeople for better coordination with helpline services and basic first aid can further definitely improve post-crash care.

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Conflicts of interest

There are no conflicts of interest.

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