

# Rank Order Impediments to First Responder Care on Road Traffic Accident Victims among the Auto Rickshaw Drivers of a Selected District of Karnataka

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## ABSTRACT

**BACKGROUND:** The mortality rate of road traffic accidents (RTAs) is high in India. RTAs lead to disability and mortality in young adults in the country. It is a global problem as approximately 1.24 million deaths occur annually worldwide because of RTAs. India lacks an organized system of trauma care to attend to trauma cases immediately at the accident site.

**OBJECTIVE:** The present study attempted to identify the impediments of auto rickshaw drivers to provide first responder care to RTA victims.

**MATERIALS AND METHODS:** The study used a quantitative approach with a cross-sectional survey design after institutional ethics clearance. The sample size was 1040, with a confidence level of 95% on the literature review knowledge score. A convenient sampling method was used for sample selection.

**RESULTS:** A majority (n = 335; 32.2%) of the participants belonged to the age group between 41 and 50 years and were educated up to secondary school (n = 551; 53.0%). A majority of the participants (n = 345; 33.2%) exhibited 16–30 years of driving experience. Among the participants, 602 (57.9%) exhibited experience in administering first aid. Of the total participants, 898 (86.3%) reported that legal issues and inadequate community support and resources were the major barriers to administering first aid, whereas 888 (85.4%) participants reported psychological problems as the major barrier. Additionally, attitude toward first aid was the barrier for 814 (78.3%) of the participants, whereas poor knowledge was the barrier for 589 (56.6%) for providing first aid care.

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**CONCLUSION:** The present study identified the various barriers faced by the participants in providing first responder care to RTA victims and exhibited the significance of providing training to common people which will be contributed to SDG 3 and 4.

**KEYWORDS:** First care; First injury care; First responder care; Road traffic accident care; Road traffic injuries.

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## INTRODUCTION

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According to the report by the World Health Organization (WHO) on road safety, 1.35 million people die annually worldwide due to road traffic accidents (RTAs). Road traffic injuries are a leading cause of death in the age group of 5–29 years. Approximately 50 million individuals underwent nonfatal injuries following RTA, with most of them exhibiting disabilities from these injuries. The majority of victims of RTAs in both developed and developing countries are foot travelers, cyclists, and motorbike riders. Immediate attention is required to set interventions to prevent RTAs and save lives. The WHO addressed the RTA mortalities as an “epidemic” because they would become the world’s fifth biggest killer by 2030. Although developed countries have been able to reduce their RTA mortality rates, they are on the rise in the developing and underdeveloped nations.<sup>1</sup>

The Decade of Action for Road Safety 2021–2030 was launched by the WHO in October 2021 with the primary goal of preventing at least 50% of road traffic injuries and deaths by 2030. The strategies underline the importance of a 360 degree tactical plan for road safety. In the strategic plan, the provision of timely life-saving emergency care for the injured is emphasized as a global plan.<sup>1,2</sup>

India is a rapidly developing nation in the South East Asian region.<sup>2</sup> Approximately 6 million new motor vehicles are launched annually on Indian roads.<sup>3</sup> India has registered the maximum number of road accidents in the world. According to the National Transportation Planning and Research Centre experts, the number of road accidents reported in India is thrice that reported in developed countries.<sup>4</sup> Approximately 13 people lose their lives every hour in RTAs. According to a global report, India has the second highest mortality rate from road traffic injuries globally at 29.2 per 100,000 people.<sup>5,6</sup>

Approximately 1.27 million people in India sustain serious injuries due to RTAs. India accounts for 6% of the total global RTA mortality even though it has only 1% of the world’s motor vehicles.<sup>7</sup> A majority of major accident survivors are either bed or wheelchair bound for the rest of their lives due to brain or spinal cord injury.<sup>8</sup> The chance of survival from a serious RTA is maximum if the victims are brought into the casualty department within the first hour of trauma, referred to as the “golden hour”.<sup>9</sup>

Most RTA deaths are reported during the pre-

arrival time to the hospital due to a lack of travel facilities or long travel distances, especially in rural and remote areas. Efficient first response care can save the lives of RTA victims.<sup>10,11</sup>

Autorickshaws are a three wheeled public transport vehicle operated by low horsepower engines and is observed in all major Indian cities. Their center of gravity allows them to swivel in impossible twists around the heavy traffic roads. Thus, they are the perfect vehicle for people who do not have personal transport and do not wish to take buses. A city has more than 1,00,000 autorickshaws compared with 100 ambulances, thus making auto rickshaws the most accessible vehicle during a medical emergency.<sup>12</sup>

Although the emergency ambulance service is provided by the government, the efficiency of the service is questionable due to various factors.<sup>13,14</sup> Thus, the present study attempted to assess the barriers faced by the auto rickshaw drivers, who are easily accessible in a community, in providing first responder care to RTA victims in the urban and rural areas of the Udupi district of Karnataka.

### **Research gaps Identified:**

An observational study was conducted in 220 licensed drivers to assess their skill in immediate care to save RTA victim lives in Thailand. An observational checklist was used to collect the data from the sample. The majority (71%) of drivers exhibited poor skills in managing head injuries, whereas 67% exhibited poor skills in the care of fracture extremities and spinal cord injuries.<sup>15</sup>

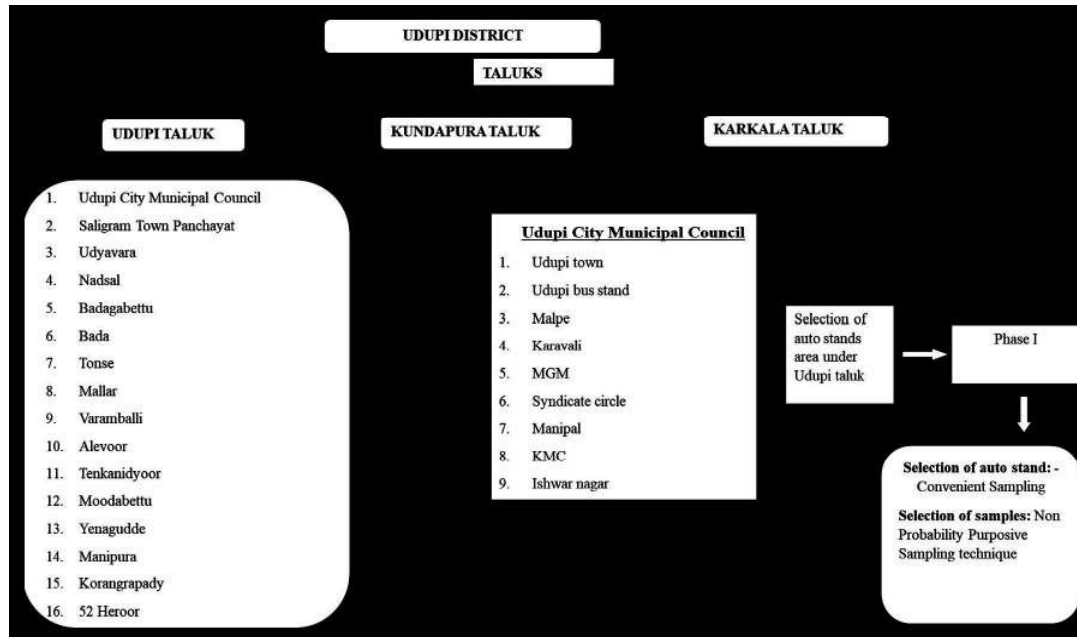
A few large scale studies have been conducted in India. The study by XYZ *et al.* reported the readiness and accurate care techniques to save the life of accident victims. Approximately 7% of roadside fatalities could be prevented if members of the public are equipped to save lives.<sup>16</sup> Thus, the present study attempted to assess the impediments faced by the common people in administering first responder care to RTA victims. Auto rickshaw drivers were deemed ideal candidates for assessment as they were observed in all community areas with their vehicle.

### **Objectives:**

The present study attempted to identify the impediments of autorickshaw drivers in providing first responder care to RTA victims which will be contributed to SDG 3 and 4.

**MATERIALS AND METHODS**

A quantitative research approach with a cross-sectional survey design was used.



**Fig. 1:** Sample selection process

Fig. 1 illustrates the sample selection. The Udupi taluk was selected from various taluks of Udupi district and has 16 major autorickshaw stands, of which the Udupi municipal stand was selected. These selections were performed using the simple random selection method. The samples from each sub-autorickshaw stand were selected using the convenient sampling technique from the various autorickshaw stands in the Udupi district. The sample size was calculated using the following formula:

Sample size for estimation of proportion

$$n = \frac{(z_1 \alpha/2)^2 pq}{d^2}$$

The confidence level was set at 95% and based on previous study scores. The margin of error (d) was set as 0.03. The final sample size was 1040.

$$N = \frac{(1.96)^2 \times 0.42 \times 0.55}{(0.03)^2}$$

**Inclusion criteria:**

Authorickshaw drivers aged less than 65 years

who were willing to participate in the study were included.

**Exclusion Criteria:**

Authorickshaw drivers with any serious health issues, those who were known for homophobia, and those who were unable to read English or Kannada language were excluded from the study.

**Operational Definition:**

In the present study, first responder care refers to the care provided to victims within the first hour of RTA to reduce the accident complications by providing recovery position; primary management for bleeding, extremity fractures, and head and neck injuries, and shifting of the victim to a hospital. First responder refers to the person who initiates immediate care for RTI victims before shifting the victim to a hospital or arrival of the medical care team at the accident scene.

**Data collection Procedure:**

Authorickshaw drivers were met at their workplaces after obtaining permission from the

authorities. Consent was obtained after explaining the procedure and objectives of the project. The impediment survey tool was used to collect responses on the impediments to the first responder care.

#### Data Collection Instrument:

An impediment survey tool comprising 35 statements that were validated by experts in various fields was used to collect data. It was initially implemented on 20 autorickshaw drivers to check its reliability and was modified based on the responses obtained from them, before being used for the final data collection. The final tool was pretested with 10 subjects to check its accuracy. These 25 subjects were not included in the final data analysis. The finalized tool was used to collect the data.

#### Ethical Consideration:

Permission was obtained from the Institutional Research Committee (IRC 92/2017) and the Institutional Ethical Committee (IEC 473/2017). The study was registered in CTRI, and the CTRI registration id is CTRI/2017/09/009715. Official permission was obtained from the autorickshaw driver's association. Participant information sheets were distributed to participants, and written consent was obtained from each participant. Special care was taken to maintain confidentiality and reassure participants that the findings of the study will not affect their careers.

#### DATA ANALYSIS

Data analysis was performed using SPSS Software. SPSS's latest version was used for computing the statistics. Frequency distribution and percentage were computed for all the variables.

#### RESULTS

**Table 1:** Frequency and percentage distribution of samples based on demographic variables **N=1040**

Age in yrs	Frequency	Percentage
18 - 30	96	9.2
31 - 40	286	27.5
41 - 50	335	32.2
Above 51	323	31.1

Gender		
Male	1040	100
Female	00	00
Educational status		
Primary	391	37.6
Secondary	551	53.0
P.U.C.	86	8.3
Graduate	12	1.2
Years of driving experience		
less than 5 years	145	13.9
between 6 - 15 years	263	25.3
between 16 - 30 years	345	33.2
above 30 years	287	27.6

The majority of the participants (n = 335; 32.2%) were in the age group of 41-50 years, 323 (31.1%) participants were in the age group of 51-55 years, and 96 (9.2%) participants were in the age group of 18-30 years (Table 1). All participants were men, with no female drivers in the study. The majority of the participants (n = 551; 53%) had completed secondary school education, whereas 391 (37.6%) had only primary school education. Only 12 (1.2%) participants had education up to graduation. Most of the participants (n = 345; 33.2%) exhibited 16-30 years of driving experience, 287 (27.6%) exhibited more than 30 years of driving experience, and 145 (13.9%) participants exhibited less than 5 years of driving experience.

**Table 2:** Frequency and percentage distribution of samples based on experience in providing first responders care, accident time and type of vehicle **n=1040**

Previous experience in providing first responders care	Frequency	Percentage
Yes	602	57.9
No	438	42.1
Time of attending the victims*		
Morning (6 am - 12N)	218	36.22
After Noon (12N - 5 pm)	86	14.28
Evening (5 pm - 10 pm)	95	15.78
Night (10 pm - 6 am)	203	33.72
Type of vehicle met with the accident*		
Motor cycle with or without gear	407	67.61
Auto rickshaw	29	4.82

Table to contt...

Car	68	11.29
Bus	40	6.65
Lorry/Truck	58	9.63

\*n=602

Only 602 (57.9%) participants had experience in providing first aid care, whereas 438 (42.1%) did not have any such experience (Table 2). Of the 602 accidents, most accidents (n = 218; 36.22%) occurred in the morning time (between 6 am and 12 pm), whereas 203 (33.72%) accidents occurred at night (between 10 pm and 6 am). The least number of accidents (n = 86; 14.28%) occurred in the afternoon (between 12 pm and 5 pm). Motorcycles (n = 407; 67.61%) were most commonly involved in RTAs, whereas auto rickshaws (n = 29; 4.82%) were the least involved in RTAs.

**Table 3:** Frequency and percentage distribution of samples based on Barrier assessment score n=1040

Barrier	Frequency	Percentage
Legal issue	898	86.3
Community support & Resources	898	86.3
Psychological	888	85.4
Attitude	814	78.3
Knowledge	589	56.6

Data in table 3 presents the barriers faced by autorickshaw drivers in providing first responder care to RTA victims in the rank order. Of the total participants, 898 (86.3%) reported that legal issues faced by them after first responder care, inadequate community support in providing immediate life-saving care, and lack of resources to provide first responder care were the major barriers in providing first aid to RTA victims. Psychological problems of the providers was reported by 888 (85.4%) participants as another barrier. The attitude of the participants toward first responder care to RTA victims was the barrier for 814 (78.3%) participants, whereas some participants (n = 589; 56.6%) reported the lack of knowledge about first aid care as a barrier.

**Table 4:** Rank order of the impediments received from the first aid care responder's n=1040

Barrier	f	%
<b>Legal problems</b>		
• Arrest by police	966	92.88
• Legal burden in future	837	80.48

• Pay the treatment cost	798	76.73
• Samaritan law	586	56.35
• Providing personal details	420	40.39
• Civil or criminal case	222	21.34

**Community Support & Resources**

• Adequate training in first aid	924	88.85
• Other's help	772	74.23
• Reaction of hospital people	747	71.83
• Availability of ambulance	646	62.12
• Access to any equipment	628	60.38

**Personal Psychological issues**

• Worried about the steps	819	78.75
• Giddy or irritable mood	793	76.25
• Consciousness about other's reaction	748	71.93
• Self-confidence	537	51.64

**Attitude towards caring for the victims**

• Don't like to give care	853	82.02
• Accidents happen due to the victim's mistake	762	73.27
• Giving care to the accident victims is not my responsibility	474	45.58
• Readiness to use own vehicle	456	43.85

**Knowledge on first responders' care**

• Concept of RTI	738	70.97
• Meaning of first responders' care	575	55.29
• Wound care	479	46.06
• Head injury care	468	45
• Spinal cord injury care	447	42.99
• Airway management	443	42.6

The researcher has identified the barriers faced by the first aid care responders in initiating the care and is ranked in table 4. As discussed, the impediment is broadly categorized into legal issues, support from the community and resources, psychological problems faced by the first aid care responders, and attitude and knowledge of the responders. From the above categories, the researcher has ranked the barriers according to the response received from the first aid care responders.

The result highlights that a majority of the responders are concerned about the arrest (92.88%) by the police, which ranked as top in the category of legal formalities. Any possibility of legal liability in future related to the incident has resulted in 80.48 % of the respondents from providing care. Financial

liabilities for the treatment are also a major concern as reported by 76.3%. 56.5% identifies the lack of knowledge about the good samaritan law as a barrier to providing care. Around 40.39% and 21.34% are worried to provide personal details and the remaining identifies the possibility of any legal cases such as criminal or civil common barrier. Looking at the support received by the first aid care responders from the community and the availability of resources have highlighted the dominance of lack of adequate training among the barriers, which is ranked the highest by 88.85% of the responders. This is followed by lack of other's help (74.23%), reaction of hospital people (71.83%), lack of ambulance for immediate transport of the victim (62.12%) and access to equipment (60.38%) for first aid provision as other barriers.

The attitude of the responders was assessed using a few indicators such as willingness to provide care, responsibility for the care and transportation of victims to the healthcare organization. The survey revealed that 56.3% of the responders always like to provide care and 42% reported that the responsibility of providing care doesn't belong to them. However, another 51.3% of the responders agreed to immediate transportation of the accident victims in their vehicles. Similarly, the keen cause of accidents is identified as the poor driving skills of victims. 73.27% ranked that the cause of accidents is due to the victim's mistake. Giving care to the victims is not the responsibility of auto rickshaw drivers have been ranked as third by 45.58% of the respondents.

Likewise, readiness to use own vehicle is ranked last in the category of attitude of the respondents by 43.85%. The knowledge of the respondents have highlighted that lack of knowledge on RTI as the top barrier in providing care by 70.97%. This is followed by lack of knowledge of first responder's care (55.29%), knowledge on wound care (46.06%), head injury (45%), spinal cord injury (42.99%) and airway management (42%).

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#### DISCUSSION

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The present study attempted to identify the impediments faced by autorickshaw drivers in providing first responder care to RTA victims. To the best of our knowledge, this study is the first of this type conducted in Karnataka. Thus, the results of the study can be used by policy makers to solve problems faced by the people in providing first responder care to RTA victims.

The majority of the participants (n = 335; 32.2%)

were in the age group of 41–50 years. This finding is contradictory to those of some studies conducted among drivers.<sup>17,18</sup> Most studies revealed that the average age of drivers was 30 years. However, in the present study, only 96 (9.2%) participants were in the age group of 18–30 years. Additionally, the majority of participants were of late middle age. Age increased their responsibility for their work and fear to involve in risky incidences. Additionally, their physiological illness or other personal problems prevented them from providing quick immediate first responder care to the RTA victims.

All participants were men, and there were no female autorickshaw drivers. This finding is concurrent with those of other studies conducted among drivers.<sup>17,18</sup> These findings may be attributed to biological reasons or the cultural background of the geographical area. Driving is a job requiring more physical strength and is probably the reason for the lack of female drivers. Additionally, some societies are not ready to accept women as drivers for commercial or transport vehicles.

The majority (n = 551; 53%) of participants had completed secondary school education. This finding is contradictory to that of another study reporting that most drivers had completed primary education.<sup>19,14</sup> Higher educational status ensures increased awareness about first responder care.

Most of the participants (n = 345; 33.2%) exhibited 16–30 years of driving experience. These findings are concurrent with those of another study.<sup>17</sup> A rich driving experience is crucial for minimizing the chance of accidents and providing superior service and care to victims.

Only 602 (57.9%) participants had experience in providing first responder care to RTA victims. This finding is concurrent with those of other studies.<sup>19</sup> Most participants exhibited some experience in providing care to RTA victims, exhibiting their intention to help others during times of crisis. In the present study, most accidents (n = 218; 36.22%) occurred during the morning time between 6 am and 12 pm. This finding is contradictory to that of another study.<sup>7</sup> This may be due to heavy traffic, congested roads, and careless and busy pedestrians during school and office hours. Effects of alcohol, careless driving, and the use of mobile phones during driving may also contribute to accidents.

The present study revealed that motorcycles (two-wheelers) (n = 407; 67.61%) were most commonly involved in accidents when compared with other vehicles. This finding is concurrent with that of other studies.<sup>20,7,21</sup> Accidents mainly occur due to overspeeding, risky driving, or unsteadiness of the

vehicle. Poor road conditions and bad weather also contribute to accidents to some extent.

A majority (n = 898; 86.3%) of the participants reported that legal issues they were forced to face after first responder care, inadequate community support in providing immediate life-saving care, and lack of resources to provide first responder care were the leading barriers in providing emergency life-saving care to RTA victims. This finding is concurrent with that of a study conducted in Karnataka.<sup>13</sup> The major complaint raised by the participants was that they were called and interrogated by police officers in connection with the accident. Additionally, they were taken to court several times in connection to the RTA cases, exhibiting the significance of generating awareness among the general population about the legal protections and responsibility of the first responders to RTA care. The participants also reported the lack of support from other people when they initiated care for RTA victims. No emergency equipment or resources were available for first responder care. As per traffic rules, first aid boxes are compulsory in vehicles. However, the majority of transport vehicles do not maintain the first aid box properly. Additionally, ambulances often do not reach the accident spot on time. This is a serious problem faced by the first responder, which can be solved only with the formulation of a comprehensive algorithm for first responder care by policymakers of the country. Additionally, legal protection should be provided to the people administering first responder care to RTA victims.

Psychological problems were reported to be another barrier in providing first responder care by 888 (85.4%) participants. The major problems faced by the participants under this barrier were the fear of the accident scene, blood, and failure. This finding is concurrent with that of another study, which stated that the mental health of drivers was also crucial for proper driving and care.<sup>22</sup> The fear of failure scared the participants in providing care to RTA victims this is a serious problem and can be solved only with proper guidance and counseling.

Most participants (n=814; 78.3%) in the present study exhibited a negative attitude toward providing first responder care to RTA victims. This finding is concurrent with that of another study conducted on drivers.<sup>22</sup> Most participants felt that immediate care for RTA victims was to be provided by the emergency department or police and that it was not the drivers' job to look after them. They also expressed that by providing emergency care by investing their time, energy, and sometimes money,

they were encountering trouble later may be from the hospital administrators, police, and relatives of the victims, while not benefiting in any form. This problem can be solved by providing proper recognition and support to caregivers with all the necessary compensation and protection.

Another major finding of the present study is the lack of knowledge about first aid care being the barrier for some participants (n = 589; 56.6%) in providing first responder care to RTA victims. This result is supported by that of another major study conducted in Iran<sup>23</sup> stating that emergency care providers require knowledge and training in first responder care. This can be assured by providing compulsory training programs in first responder care for drivers during the renewal process of driving licenses. In India, although motor vehicle rules mandate a first aid class for obtaining a driving license, the efficiency of the participants in providing first responder care is not measured. Knowledge deficit in providing first responder care can be solved by tightening the rules regarding attending the first aid class and also by arranging refresher training courses on first responder care at regular intervals.

The present study is one of the first studies conducted in Karnataka to identify the barriers in providing first responder care to RTA victims. The single-center design of the study is a limitation of the study. However, the result can be generalized for all the drivers as the participants in this study were from various backgrounds. Further multicenter studies can be conducted in a wider range to identify additional barriers faced by people in providing first responder care.

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#### CONCLUSION

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The present descriptive study is relevant in the present time to understand the barriers faced by autorickshaw drivers in providing first responder care to RTA victims. These problems must be addressed and solved permanently in a timely fashion. If policymakers implement programs to create awareness among the general public about first responder care, numerous lives that are lost due to RTAs can be saved.

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