Journal of Health Sciences and Innovative Research 2024;5(1):26-40
DOI: https://doi.org/10.31357/jhsir.v5i01.7728

Research Article

Knowledge And Practice Regarding Prehospital Care After Road Traffic Accidents Among Three-Wheel Drivers and Associated Factors in Selected Police Areas in Colombo District, Sri Lanka

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Abstract

Introduction: Road traffic injuries are an increasingly significant public health issue worldwide. Knowledge and practice of prehospital care is a crucial responsibility of every citizen of the country. Pre-hospital care is delivered by a civilian first responder, who is usually another driver. The study aims to describe the knowledge and practice of prehospital care after a road traffic injury among three-wheel drivers and associated factors in selected police areas in the Colombo District. Methods: A community-based descriptive cross-sectional study was carried out in three Colombo Municipality police areas. A sample of 384 full-time three-wheel drivers above the age of 18 years, registered in these police areas were recruited using a simple random sampling method. A structured pre-tested interviewer-administered questionnaire was used for data collection. Descriptive analysis was used to determine the level of knowledge and practices regarding prehospital care. SPSS version 25 was used for data entry and analysis. Significance was taken as $p<0.05$. Results: Mean age of three-wheel drivers was 40.98 (SD±11.01). Only 31.5% of the drivers had first aid training. The majority (52.9%) of the drivers had good knowledge and 65.2% had poor practice towards prehospital care. Advanced age (>45 years) and having first aid training were significantly associated with good knowledge ($p<0.05$). Drivers with previous training within the last ten years ($p=0.031$) and having less hires per day (<10) were significantly associated with better first aid practice ($p=0.001$). Conclusion: Although knowledge regarding prehospital care was adequate, practice of prehospital care was inadequate. Findings of the study call for ongoing first-aid training for all three-wheel drivers.

Keywords: Prehospital care, First aid, Knowledge, Practice, Road traffic accidents

Introduction

Road traffic injuries are an increasingly significant public health issue worldwide, accounting for approximately 1.35 million deaths each year. It has become the 8th leading cause of death for people of all ages. Between 20 and 50 million more people suffer non-fatal injuries, with many incurring a disability as a result of their injury (1,2).

Globally, millions of people are coping with the death or disability of family members from road traffic injury. Road traffic injuries cause considerable economic losses as well to the

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Received: 30 April 2024; Accepted: 22 August 2024

How to cite this article:
Nawarathna, S.N.A.M. and Goonewardena, C.S.E. Knowledge and Practice regarding prehospital care after road traffic accidents among three-wheel drivers and associated factors in selected police areas in Colombo district, Sri Lanka, Journal of Health Sciences and Innovative Research, 2024;5(1):26-40

individuals, their families, and to nations. These losses arise from the cost of treatment as well as lost productivity of those killed or disabled by their injuries, and for family members who need to take time off work or school to care for the injured. Road traffic crashes cost most countries 3% of their gross domestic product (2).

Progress of reducing road traffic deaths over past few years varies significantly between the different regions and countries in the world. There is a strong association between the rate of road traffic deaths and the income level of the country. With an average rate of 27.5 deaths per 100,000 populations, the risk is more than 3 times higher in low-income countries than in high-income countries where the average rate is 8.3 deaths per 100,000 population (2).

Sri Lanka is a middle-income country and ranks 61 in the list of countries by population which is 21.9 million according to the latest statistics (3). Trauma is a leading cause of hospitalization in Sri Lanka and accounts for almost 600,000 patients per year in Government Hospitals. Most moderate to severe trauma results from road traffic accidents (4). According to the sources of the Ministry of Transport and Highways in Sri Lanka, 24,468 road traffic accidents have been reported and has caused 2,515 deaths due to road traffic accidents in the year of 2022 (5). It is often possible to minimize crash consequences by providing effective pre-hospital services promptly. Currently, more than 90% of road traffic injury deaths occur in developing countries where approximately 80% of injury deaths occur in the prehospital setting. So, establishing organized prehospital care can save many lives and possible disabilities (6).

Pre-hospital services are a continuum of activities that occur at the crash site and till the injured person is adequately managed by hospital staff (6). There is ample medical evidence to recommend a “golden hour” for road traffic accident victims. If the necessary care is given immediately for casualties within this time, there is a greater chance of survival and a reduction in the severity of their injuries (7). Regardless of how simple or sophisticated a given prehospital trauma care system might be, certain elements are essential to decrease preventable morbidity and mortality. These elements include, at a minimum, prompt communication and activation of the prehospital trauma care system, the prompt response of the system, and the assessment, treatment, and transport of injured people to formal health-care facilities, when necessary (8). In many communities, the most basic level of prehospital trauma care is provided by laypeople known as “first responders”. They comprise the first level of the prehospital system. They may be motivated lay people from the community or people from specific occupational groups, such as taxi drivers or truck drivers, soldiers, students, or workers, who are trained through voluntary or mandatory programs to recognize an emergency, call for help and can act as the basic first aid providers until more formally trained rescuers arrive. First aid is an assistance given to the person suffering a sudden injury or illness, with care provided to preserve life, prevent the condition from worsening and reducing severity of injuries (7). Even the most sophisticated and well-equipped prehospital trauma care system can do little if bystanders fail to recognize the seriousness of a situation, call for help and provide basic care until help arrives. In Sri Lanka, there is no well-established prehospital trauma management system (9). According to the global status report published by world health organization, there is no formal certification for prehospital providers and no National assessment of emergency care systems in Sri Lanka. In most low- and middle-income countries including Sri Lanka first responders are usually a relative, driver of a private vehicle, police officers, and other motorist (bus drivers, minibus drivers, and taxi drivers) who are usually untrained (6). Actions of the first

responders at the crash site are very much important in prehospital care and in the Sri Lankan setting, another driver is more likely to be the first responder. The number of three-wheel vehicles registered in the country has risen sharply. There are 1,184,356 three wheels within the country by 2022 and 3515 three-wheel accidents have occurred in 2022, according to the latest statistics compiled by the Department of Motor Traffic (10). Thereby the ratio of three-wheelers to people stands at 1:18 (1 three-wheeler for every 18 persons). Therefore, it is more likely for a three-wheel driver to be at a crash site and to be a first responder. There was no ample evidence previous study conducted in Sri Lanka to assess the knowledge and practice regarding prehospital care among three-wheeler drivers. This study aimed to describe the knowledge and practice of prehospital care after a road traffic injury among three-wheel drivers and associated factors in selected police areas in Colombo district.

Methods

A community-based descriptive cross-sectional study was carried out in three randomly selected police areas in the Colombo district, Sri Lanka from May to June 2019. Colombo District has the highest population density in the country. In the Colombo Municipal Council administrative area of Colombo District, there are three Deputy Inspector General of Police (DIG) areas. They are Colombo North, Colombo South and Colombo Central DIG areas.

A sampling framework of registered three-wheel drivers in above police areas were obtained from united three-wheel drivers' associations of each police area. The sample size was calculated using the formula for estimation of proportions in descriptive studies (11). A standard normal deviate for specified alpha error was set at 1.96 which corresponds to 95%, while precision was set at 0.05. The size of the sample from the above calculation was 384 and proportion of drivers to be taken from each police area were calculated according to probability proportionate to size, so that final sample of 422 was obtained with 10% non-response rate. There were 655, 426 and 384 registered three-wheel drivers in the three selected police areas respectively. Accordingly, data from 189, 123, and 110 three-wheel drivers registered in the three police areas were collected respectively. The data was collected in three-wheel parks in selected police areas according to simple random sampling method. The study population included full time three-wheel drivers above the age of 18 years who have at least one year experience as a three-wheel driver. Those drivers who work for private taxi companies and those who have less than 1 year of driving experience were excluded from the study.

An interviewer-administered questionnaire was developed under the guidance of the supervisor, based on questionnaires used in previous studies and according to the World Report on Road Traffic Prevention and the internationally accredited First Aid Manual for Sri Lanka by St John Sri Lanka (12,13). The questionnaire was pretested among 15 to 20 registered three-wheel drivers in the Wellawatta Police areas before conducting the study. The opinion of the experts in the field was also taken. Content and face validity were carried out by experts in the field of trauma. The questionnaire was developed under the socio-demographic and economic characteristics of the drivers, the knowledge regarding prehospital care and practice regarding prehospital care.

SPSS (Statistical Package for Social Sciences) version 25 was used to enter data and for analysis. Descriptive statistics was used for summarizing and presenting data. Data was presented as graphs and charts.

Knowledge was analyzed based on 11 main knowledge questions which includes 46 sub-questions. For each correct answer "1" mark was

given and "0" mark for incorrect and don't know responses so that the maximum score that one can obtain was 46 and the minimum was zero. Then depending on the mean value, overall knowledge was divided in to two categories named, "Good" and "Poor" knowledge. Practices regarding pre-hospital care of the respondents who have witnessed a Road Traffic Accident (RTA) within one year were determined using nine statements which states actions taken during an RTA. The correct action taken was given "1" mark and "0" was given if the action was not taken. Those who scored above the mean was labelled as having a good practice and those who scored below the mean was classified as having poor practice.

Chi square test was used to determine significance of categorical data. Odd's Ratios and 95% confidence interval was calculated. P value of 0.05 was used to determine the significance.

Informed written consent was obtained. Confidentiality and anonymity were maintained throughout the study. After data collection, subjects were given a leaflet regarding prehospital care to enhance their knowledge. Ethical approval was obtained from the Ethics Review Committee of Faculty of Medical Sciences, University of Sri Jayewardenepura. Further approval was obtained from the three selected police stations. Investigator administered the questionnaires to the registered three-wheel drivers in their relevant three-wheel parks.

Results

A total of 384 three-wheel drivers responded to the study which resulted in the response rate of 90.1% where 151 (39.3%), 121 (31.5%), and 112 (29.2%) respondents participated to the study from the three police divisions respectively.

Basic characteristics of the study population

The mean age of the three-wheel drivers was 40.98 (SD ± 11.01) with a range of 21 to 71 years and all the participants were male. Mean years of driving experience was 11.05 (± 8.67) years ranging from 1 year to 39 years.

Table 1: Frequency distribution of Socio-demographic characteristics (N=384)

Characteristics	Number (%)
Age group	
18-32	96 (25.0%)
33-44	154 (40.1%)
≥45	134 (34.9%)
Nationality	
Sinhala	311 (81.0%)
Tamil	47 (12.2%)
Muslim	25 (6.5%)
Others	1 (0.3%)
Education	
Primary	13 (3.4%)
Grade 6-10	100 (26%)
Up to O/L	212 (55.2%)
Up to A/L	58 (15.1%)
Diploma/Degree	1 (0.3%)
Driving experience (Years)	
1-5	135 (35.2%)
6-10	88 (22.9%)
10-15	62 (16.1%)
≥16	99 (25.8%)
Number of hires per day	
1-10	51 (13.3%)
>10	333 (86.7%)
Income per day (Rupees)	
< 1000	4 (1.0%)
1000-3000	269 (70.1%)
>3000	111 (28.9%)

First aid training

Participants were asked about first aid training and only 121 (31.5%) had attended to some form of

first aid training at some stage in their lifetime and among those who obtained the training, most stated (52, 43%) that they had obtained the training 1-5 years back. These training had been given by different organizations (Red Cross), armed forces, trained by their employers, police, and some had some first aid exposure as a component of extra-curricular activities such as scouting and cadetting.

Knowledge regarding pre-hospital care

Knowledge was analyzed based on 11 main knowledge questions which includes 46 sub-questions. Definition of prehospital care was known by the majority of the respondents. Only 147 (38.8%) stated that cardiopulmonary resuscitation (CPR) should be started if the victim is not breathing and unresponsive. With regards to components of CPR, the majority (235, 61.2%) did not know about massaging the heart and giving artificial breathing (255, 66.4%) respectively. Only 112 (29.2%) knew both heart massage and artificial breathing as components of CPR, only (53, 13.8%) were aware either one as a component of CPR and the majority (219, 57%) were not aware about both heart massage and artificial breathing as component of CPR.

The majority (224, 58.3%) were aware that changes in the normal shape of the vertebral column as a sign to suspect a spinal cord injury. However, most (more than 50%) were not aware that wound or pain in the neck, external wound associated with the vertebral column, lack of control over arms or legs, change or loss of sensation, breathing difficulties are signs to suspect a spinal cord injury. The majority (323, 84.1%) were aware that patient should be kept still and 264 (68.8%) knew that head, neck, and vertebral column should be supported in a way that they are in line if a spinal cord injury is suspected. However, only 59 (15.4%) knew jaw thrust must be used to open the airway and only 72 (18.8%) knew that head tilt and chin lift method should not be used in such situations. Only 158 (41.1%) knew the emergency contact number to contact an ambulance.

The majority 248 (64.6%) had good knowledge to identify signs of air way problem and 309 (80.5%) were knowledgeable regarding fracture immobilization. However, less than 50% of the subjects had good knowledge regarding management of an unresponsive patient who is not

Table 2: Knowledge regarding important aspects of prehospital care (N=384)

Characteristics	Good knowledge (%)	Poor knowledge (%)
Signs of airway problems	248 (64.6%)	136 (35.4%)
Management of an unresponsive patient who is not breathing	167 (43.5%)	217 (56.5%)
Management of a patient who is breathing yet unresponsive	149 (38.8%)	235 (61.2%)
Bleeding	173 (45.1%)	211 (54.9%)
Spinal cord injury	192 (50%)	192 (50%)
Fracture immobilization	309 (80.5%)	79 (19.5%)
Factors to consider when transporting the patient to a hospital	149 (38.8%)	235 (61.2%)

breathing, management of a patient who is breathing yet unresponsive, bleeding, factors to consider when transporting the patient to a hospital and 50% of the subjects had good knowledge regarding spinal cord injury (Table 2).

The mean knowledge score of study participants was 28.02 (SD±8.43). When the scores were converted into percentages, the score ranged from 0% to 95.65% with a mean score of 60.91 (SD±18.34). Table 3 shows that the majority (>50%) of the respondents had good overall knowledge, with a knowledge score above average (60.91%) regarding pre-hospital care after road traffic accidents.

Practice regarding pre-hospital care

The majority (86.7%) of the participants had witnessed road traffic accident in the past one year and out of that most (74.8%) has attended to a road traffic victim.

Frequency distribution regarding actions taken during an RTA is shown in the Table 4. The minority (41, 16.5%) had taken actions to control bleeding and only 17 (6.8%) of the participants had taken actions to stabilize a fracture. Even though the majority 172 (69.1%) had taken RTA victim to a hospital, only 61 (24.5%) had ensured safe positioning while taking the patient to a hospital.

Table 5 shows the frequency distribution regarding reasons for not attending to an RTA victim. Out of many reasons for not attending to a road traffic victim, the majority (50, 59.5%) had not attended to an RTA victim due to lack of confidence to provide first aid. For more than 50% of the subjects, legal complications that follows later had been a reason for not attending to an RTA victim. Out of the study participants only five (1.3%) three-wheel drivers had first aid box in their vehicle.

Table 6 shows the overall distribution of practice regarding pre-hospital care. Practices regarding pre-hospital care of the respondents who have witnessed an RTA within one year were determined using nine statements that state actions taken during an RTA. The mean practice score of study participants was 2.64 (SD±1.33). When the scores were converted into percentages, the scores ranged from 0% to 88.89% with a mean score of 29.33 (SD±14.77). The majority (217, 65.2%) had poor practice while only 116 (34.8%) had good practice towards pre-hospital care after RTA.

Associated factors on knowledge and practices regarding pre-hospital care after an RTA

Table 7 shows the association between socio-demographic characteristics and knowledge regarding pre-hospital care. Accordingly, the majority of the respondents who were more than 45 years of age, (107, 60.8%) had better knowledge than the respondents who were ≤45 years of age (96, 46.2%). This observed difference was statistically significant (p=0.004). The majority of the respondents who had first aid training (105, 86.1%) had better knowledge than who did not have a first aid training (98, 37.4%). This observed difference was highly significant (p<0.001). Most of the respondents (34, 57.6%)

Table 3: Knowledge regarding pre-hospital care after a road traffic accident (N=384)

Characteristics	Number (%)
Good knowledge	203 (52.9%)
Poor knowledge	181 (47.1%)

with higher education level had better knowledge than their counterparts (169 ,52%), but that was not statistically significant (p=0.426). Marital status, Ethnicity, years since last training, and hires per day had no association with the knowledge regarding pre-hospital care (p>0.05).

Table 8 shows the association between socio-demographic characteristics and practice regarding pre-hospital care. Accordingly, the age, ethnicity, education level, marital status had no significant association with the practice of pre-hospital care after an RTA (p>0.05). Respondents who had driving experience more than 10 years had better practice (57, 40.1%) than who had driving experience less than 10 years (57,29.8%). However, this observed difference was not statistically significant (p=0.05). The majority of the respondents who had first aid training (45, (42.5%) had better practice than who did not have a first aid training (69, 30.4%). This observed difference was statistically significant (p=0.031). Also, those who had the training within last ten years had a better first aid practice (35, 52.2%) than those who had the training before 10 years (10, 27.0%). This observed difference was statistically significant (p=0.013). Those who have more hires per day (86, 29.7%) were less likely to provide prehospital care for an RTA victim than who drive less hires per day (28, 65.1%). This observed difference was highly significant (p<0.001).

Discussion

Road traffic accidents have become a major killer causing a national tragedy in Sri Lanka. Delivering proper prehospital care to a road traffic accident victim can reduce the morbidity and mortality of those victims. In many communities, basic pre-hospital care is delivered by a first responder who is usually a lay person. According to the reports

Table 4: Frequency distribution regarding actions taken during an RTA (N=249)

Characteristics	Action taken (%)	Action not taken (%)
Called for help	124 (49.8%)	125 (50.2%)
Called an ambulance	67 (26.9%)	182 (73.1%)
Moved patient from accident site to a safer place	132 (53%)	117 (47%)
Making sure that patients' airway is clear	25 (10%)	224 (90%)
Making sure that patient is breathing properly	31 (12.4%)	218 (87.6%)
Stop bleeding	41 (16.5%)	208 (83.5%)
Splinting fractures	17 (6.8%)	232 (93.2%)
Safe positioning while shifting patient to the hospital	61 (24.5%)	188 (75.5%)
Transport patient to the hospital	172 (69.1%)	77 (30.9%)

Table 5: Frequency distribution regarding reasons for not attending to an RTA victim (N=84)

Characteristics	Reason for not attending to an RTA victim (%)	Not a reason for not attending to an RTA victim (%)
Don't see giving first aid is important	1 (1.2%)	83 (98.8%)
Not confident enough to provide first aid	50 (59.5%)	34 (40.5%)
Due to fear that germs will enter to the body	7 (8.3%)	77 (91.7%)
Due to fear of blood	10 (11.9%)	74 (88.1%)
Due to legal complications that follows later	45 (53.6%)	39 (46.4%)
As I was driving a client to a destination	28 (33.3%)	56 (66.7%)
No material to provide first aid	12 (14.3%)	72 (85.7%)
Already first aid given by someone	25 (29.8%)	59 (70.2%)

from International Federation of Red Cross and Red Crescent societies (IFRC) tens of millions of lives are saved each year by first aid techniques applied by bystanders to the victims (7). So, this study was conducted to describe the knowledge, attitude, practice and associated factors regarding prehospital care after a road traffic accident among 384 three-wheel drivers in selected police areas in the Colombo District, Sri Lanka. Only 31.5% of the drivers in this study had first aid training. The majority (52.9%) of the drivers had good knowledge and 65.2% had poor practice towards prehospital care. Advanced age (>45 years) and having first aid training were significantly associated with good knowledge ($p<0.05$). Drivers with previous training within last ten years ($p=0.031$) and having less hires per day (<10) were significantly associated with better first aid practice ($p=0.001$).

The mean years of driving experience in the current study was 11.05± 8.67 and it was much less than the study finding of Nigeria which was 26.1 years (14). In the current study, less than one third of the respondents (121, 31.5%) had attended some form of first aid training at some stage in their lifetime. Similar findings were seen in studies conducted in Ethiopia among taxi drivers' division where 210 (26.8%) of the respondents had prior first aid training (7). The respondents with a prior

Table 6: Overall frequency distribution of practice regarding pre-hospital care (N=333)

Characteristics	Number (%)
Good practice	116 (34.8%)
Poor practice	217 (65.2%)

Table 7: Association between socio-demographic characteristics and knowledge regarding pre-hospital care

Characteristics	Knowledge		Significance (p value)	OR
	Poor N (%)	Good N (%)		
Age				
≤ 45	112 (53.8%)	96 (46.2%)	X^2 =8.202	**1.81 (1.20-2.72)**
> 45	69 (39.2%)	107 (60.8%)	Df =1	
			p= 0.004	
Ethnicity				
Sinhala	142 (45.7%)	169 (54.3%)	X^2 =1.431	
Others	39 (53.4%)	34 (46.6%)	Df =1	0.73 (0.44-1.22)
			p= 0.232	
Driving experience				
≤ 10	112 (50.2%)	111 (49.8%)	X^2 =2.036	
> 10	69 (42.9%)	92 (57.1%)	Df =1	1.35 (0.89-2.02)
			p= 0.154	
Education				
Primary to O/L	156 (48%)	169 (52%)	X^2 =0.635	
A/L to degree	25 (42.4%)	34 (57.6%)	Df =1	1.26 (0.72-2.20)
			p= 0.426	
Marital status				
Married	160 (46%)	188 (54%)	X^2 =1.999	
Unmarried	21 (58.3)	12 (41.7%)	Df =1	0.61 (0.30-1.22)
			p= 0.157	
Training status				
Trained	17 (13.9%)	105 (86.1%)	X^2 =79.101	
Untrained	164 (62.6%)	98 (37.4%)	Df =1	**10.34 (5.84 -18.28)**
			P<0.001	
Years since last training				
≤ 10	11 (13.9%)	68 (86.1%)	X^2 =0.097	0.86 (0.27-2.59)
> 10	5 (11.9%)	37 (88.1%)	Df =1	
			p= 0.755	
Hires per day				
≤ 10	24 (47.1%)	27 (52.9%)	X^2 =0.000	0.99 (0.55- 1.79)
> 10	157 (47.1%)	176 (52.9%)	Df =1	
			p= 0.991	

caregivers of children less than five years in Sri Lanka which showed 63 (15.7%) had prior training (9).

In the current study only 167 (43.5%) had adequate knowledge regarding management of unconscious patients who is not breathing and only 149 (38.8%) had adequate knowledge regarding management of unconscious patients who is breathing, which indicates poor knowledge

Table 8: Association between socio-demographic characteristics and practice regarding pre-hospital care

Characteristics	Practice		Significance (P value)	OR
	Poor N (%)	Good N (%)		
Age				
≤ 45	117(65.7 %)	61 (34.3%)	X^2 =0.000	0.99 (0.63-1.57)
>45	102 (65.8%)	53(34.2%)	Df =1	
			p= 0.988	
Ethnicity				
Sinhala	175 (64.8%)	95 (35.2%)	X^2 =0.573	0.79(0.44-1.44)
Others	44 (69.8%)	19 (30.2%)	Df =1	
			p= 0.449	
Driving experience				
≤ 10	134(70.2%)	57 (29.8%)	X^2 =3.836	1.58 (0.99-2.49)
>10	85 (59.9%)	57 (40.1%)	Df =1	
			p= 0.050	
Education				
Primary to O/L	183 (66.1%)	94 (33.9%)	X^2 =0.066	1.08 (0.59-1.97)
A/L to degree	36 (64.3%)	20 (35.7%)	Df =1	
			p= 0.798	
Marital status				
Married	198 (65.1%)	106 (34.9%)	X^2 =0.624	0.71 (0.31-1.66)
Unmarried	21 (72.4%)	8 (27.6 %)	Df =1	
			p= 0.430	
Training status				
Trained	61 (57.5%)	45 (42.5%)	X^2 =4.665	**1.69 (1.05-2.72)**
Untrained	158 (69.6%)	69 (30.4%)	Df =1	
			p= 0.031	
Years since last training				
≤ 10	32 (47.8%)	35 (52.2%)	X^2 =6.172	**2.95 (1.24-7.05)**
>10	27 (73.0%)	10 (27.0%)	Df =1	
			p= 0.013	
Hires per day				
>10	204 (70.3%)	86 (29.7%)	X^2=20.915	**4.43 (2.25-8.70)**
≤ 10	15 (34.9%)	28 (65.1%)	Df =1	
			p< 0.001	

in managing an unconscious patient. Only one third of the respondents (149, 38.8%) knew that CPR should be given when the patient is unconscious and not breathing. The study conducted among 80 professional and non-professional drivers from Staszów country in Poland stated that only 22.5% of the drivers knew when to start performing CPR which is less than our study. This difference in results might be due to the study conducted in Poland being using a questionnaire having closed questions which has many available options as answers where only one answer is correct making it harder to think of the correct answer. However, in our study the subjects had to state only whether the given statement in the questionnaire is "correct", "incorrect" or "don't know" (18).

The current study observed that only 163 (42.4%) knew the correct recovery position for a semiconscious or unconscious person whereas in Karyś's research, it was even lesser (31.7%), and it was seen much higher (137, 62.3%) in the study by Mpombo and Mwanakasale in Zambia (6,18). Even though Gunawardhana and Goonewardena states that majority of children (57%) in their study were transported to the Lady Ridgeway Hospital, Colombo using Three-wheelers, about two third of the three-wheeler drivers in current study did not have adequate knowledge regarding factors to be considered when transporting an RTA victim to a hospital (9).

With regards to managing a patient with suspected spinal cord injury, half of the respondents in present study had adequate knowledge. On the contrary, 89% of the learner drivers of the study conducted in Denmark, knew how to handle a person with a suspected spinal cord of injury. This significant difference in result is due to the study conducted in Denmark has assessed this knowledge upon completion of a mandatory first aid and basic life support course (19).

In the present study 71.1% and 65.4% were aware that bleeding can be controlled by applying pressure and dressing and elevating the affected limb respectively. This result was supported by the study of Adelborg, where 75% were aware about this (19).

With regards to fracture stabilization, the majority (309 (80.9%) of current study were aware about the correct practice and it was supported by numerous studies where 88.5% and 73.4% knew that splints could be used to immobilize a fracture respectively (14,20).

An emergency telephone number was known by 1.1% of the subjects and this was observed even lesser among children caregivers in the study of Gunawardhana and Goonewardena, (21.5%) (9). This might be due to the three-wheel drivers being spending more time in the roads and often see emergency ambulance. In contrast majority 98.4% of the respondents in the Solanki's study were aware about the emergency number (20).

The present study showed that the majority (52.9%) of the drivers had good first aid knowledge. First aid knowledge about the fracture immobilization was the highest (80.5%) and lowest knowledge was seen in managing an unresponsive patient and in transporting a patient to a hospital (38.8%).

The majority of the respondents (86.7%) in the present study have witnessed an RTA within past one year and two third of them had given some sort of an aid to the RTA victim. This finding was supported by studies in India and in Nigeria where more than 80% of the subjects have given some aid to the victim (14,20). Regarding the type of first aid provided, in this study, only 16.5% took actions to control bleeding which was much less than the study Gunawardhana and Goonewardena in Sri Lanka among care givers of children, where 81.6% of the respondents took actions to control bleeding. The significant high bleeding control

seen in that study might be due to it being conducted among caregivers of children where they were more considerate towards their own child's situation (9).

The least number of respondents in our study immobilized a fracture (6.8%), whereas much higher practice was seen (18.8% and 23%) in studies conducted by Gunawardhana and Goonewardena in Sri Lanka among caregivers of children and Teshale and Alemu in Ethiopia among drivers respectively (7,9).

In the present study only 26.9% had called an ambulance. On the contrary, 41.5% and 51.1% of the respondents in two Indian studies had called an ambulance in an RTA (16,20). In Sri Lanka, Suwaseriya ambulance service (1990) now covers the entire country to expand the country's pre-hospital emergency care service under the supervision of the Ministry of economic reforms and public distribution (21). Nonetheless, in the present study, it is observed that only a small percentage of three-wheel drivers had called an ambulance as mentioned above. This might be due to 58.9% of the subjects not knowing the ambulance number. It is also observed that the majority of the respondents in the present study (69.1%) tended to transport RTA victims to the nearest hospital and it was the action taken by the majority of the participants in our study. However, only 24.5% of the subjects have been cautious about the correct positioning while transporting an RTA victim to a hospital. So, there is a risk of causing secondary injuries to the RTA victim while transporting to the hospital. In the study conducted by Teshale and Alemu, 55.7% of the respondents were transported an RTA victim to a hospital and even lesser percentage (11%) has considered about the correct positioning while transporting to a hospital (7).

The majority (59.5% and 53.6%) in the present study has stated that lack of confidence due to inadequate knowledge and legal complications were the major reasons for not attending to an RTA victim respectively. Lack of first aid box was stated by only 14.3% of the drivers as a reason. In contrast, Pallavisarji, Gururaj and Girish stated that lack of confidence due to inadequate knowledge and legal complications have been a reason for only 29.8% first responders in that study (16). However, lack of a first aid box has been the main reason for most drivers (74.3%) in the study conducted in Ethiopia (7). So, it was observed that legal complications that follows later has been a significant obstacle for the delivery of prehospital care in current study and in the study conducted in India. In the data collection period, many three-wheel drivers expressed their past experiences where they have faced many difficulties after helping an RTA victim. Some had spent hours in hospitals or police to give statements and some even had to appear in front of courts. So as a result, they might have been discouraged to help again in a similar situation. So, this might be the reason for the above obtained finding in our study with regards to legal complication.

In the present study, only 1.3% of the respondents had a first aid box in their vehicle and significantly high availability of first aid kits (84.3%, 84.9%) were seen in the studies by Gunawardhana and Goonewardena in Sri Lanka among caregivers of children and Solanki et al. in India among commercial drivers (9,20).

In the current study, only 34.8% had good practice towards prehospital care after an RTA. So, it is observed that practice towards prehospital care was generally poor in this study.

Results of the current study revealed that age and training status of the three-wheel drivers were associated with the knowledge regarding pre-hospital care after an RTA. It was observed that drivers who are above 45 years old having a higher

knowledge regarding pre-hospital care. Interestingly, drivers who had a previous training in first aid were ten times more knowledgeable than those who did not have a training. Even though drivers who had a higher educational level (A/L to Degree) had a better knowledge (57.6%) than the drivers with lower educational level (Primary to O/L), there was no significant association between educational status and the knowledge. In contrast, study of Gunawardhana and Goonewardena which was conducted in Sri Lanka among caregivers of children stated that first aid knowledge was significantly associated with the education level (9).

The results of the present study revealed that the drivers who had a previous training were more likely to provide prehospital care to an RTA victim than who didn't have a previous training and there was a significant association between them. This finding was supported by the study conducted by Teshale and Alemu in Ethiopia, where delivering first aid was five times more likely among trained drivers than those who were not (7). Astonishingly, however, drivers who had a training within last 10 years were two times more likely to provide prehospital care to an RTA victim than drivers who had a training before last ten years. It seems like, even though they had a training, with time they had lower confidence in performing pre- hospital care. Furthermore, those who take less trips per day (<10) were 4 times more likely to provide first aid to an RTA victim than those who take more trips per day. This might be due to drivers who are much more concerned with the number of hires not tending to help someone than those who are not much concerned with number of hires per day. In the present study, the level of education and driving experience was not associated with the practice of prehospital care. In contrast, those two factors were associated with the practice of pre-hospital care in the study by Teshale and Alemu in Ethiopia (7). There were few limitations in our study. We used mean split to classify individuals as having adequate knowledge (or not) and adequate practice (or not). The study participants were recruited from a single city; therefore, it may have limited generalizability.

Conclusion

Even though, the knowledge regarding prehospital care after an RTA was adequate, overall practice of pre-hospital care was inadequate among the study participants. Less than one third of the respondents in the study, had attended to some form of first aid training at some stage in their lifetime. The knowledge has been less in the areas such as managing an unconscious patient, controlling a bleeding and regarding the factors to be considered while transporting a patient to a hospital safely. Inadequate knowledge which will cause more harm than help and legal complications that follows later were the major potential obstacles that would prevent drivers from providing first aid. After witnessing an RTA, transporting the RTA victim was the main action taken by the majority of the participants in this study. Only a small percentage of respondents had a first aid kit in their vehicle. Three-wheel drivers having a first aid training had good knowledge and drivers having that training within the last 10 years had good practices regarding prehospital care. Therefore, it is recommended that prehospital care first aid training should be given to all the three-wheel drivers on a regular basis and Department of Motor Traffic should contemplate making first aid training mandatory before issuing a driving license to three-wheel drivers. As only few of the subjects knew the emergency number, it is recommended to increase the publicity of existing prehospital care number and other important emergency numbers within the population. So, a sticker with emergency ambulance number should be issued to every three-wheel. First aid kit should be made available in every vehicle. Clear regulations and legislation addressing the issues of a first aid providers taking actions at the scene is recommended as the fear of impending legal

actions can deter the drivers from attempting to help those in need of care.

Acknowledgements

We will to acknowledge all the Three wheel drivers who participated in our research.

References

1. World Health Organization. Injuries and violence. 2021. Available at: https://www.who.int/newsroom/fact-sheets/detail/injuries-and-violence [Accessed: 18 April 2024].
2. World Health Organization. SDG Target 3.6 Road traffic injuries. 2024. Available at: Road traffic mortality (who.int) [Accessed: 18 April 2024].
3. Worldometer. Sri Lanka Population. 2024. Available at: https://www.worldometers.info/world-population/sri-lanka-population/ [Accessed: 18 April 2024].
4. Wimalaratne, K., Lee, J.I., Lee, K.H., Lee, H.Y., Lee, J.H., Kang, I.H. Emergency medical service systems in Sri Lanka: problems of the past, challenges of the future. *International Journal of Emergency Medicine*. 2017 Feb 21;10(1). DOI: https://doi.org/10.1186/s12245-017-0127-x
5. Ministry of Transport and Highways. National Council for Road Safety. 2024. Available at: National Council for Road Safety (transport.gov.lk) [Accessed: 18 April 2024].
6. Mpombo, D.A.K., Mwanakasale, V. Assessment of knowledge, attitude and practice of first aid amongst minibus drivers, conductors and road traffic police officers in Ndola, Zambia. *Asian Pacific Journal of Health Sciences*. 2017 Sep 30;4(3):121–8. DOI: https://doi.org/10.21276/apjhs.2017.4.3.20
7. Teshale, A. A., and Alemu, Z. A. Knowledge, Attitude and Practice of first aid and factors associated with practice among taxi drivers in Addis Ababa, Ethiopia. *Ethiopian Journal of Health Development*. 2017; 31(3).
8. World Health Organization. Prehospital trauma care systems. 2005. Available at: https://www.who.int/publications/i/item/prehospital-trauma-care-systems [Accessed: 19 April 2024].
9. Gunawardhana, G., Goonewardena, S. Pre-hospital care received by injured children less than five years admitted to the Lady Ridgeway Hospital for Children, Colombo. *Journal of the College of Community Physicians of Sri Lanka*. 2016 Jul 18; 21(1). DOI: 10.4038/jccpsl.v21i1.8076
10. Department of Motor Traffic. Statistics. 2024. Available at: https://dmt.gov.lk/index.php?option=com_content&view=article&id=16&Itemid=132&lang=en [Accessed: 19 April 2024].
11. Lwanga, S.K., Lemeshow, S. Sample size determination in health studies : a practical manual.2017. Available at: https://apps.who.int/iris/handle/10665/40062 [Accessed: 19 April 2024].
12. World Health Organization. World report on road traffic injury prevention. 2004. Available at: https://www.who.int/publications/i/item/world-report-on-road-traffic-injury-prevention [Accessed: 19 April 2024].
13. St Johns Ambulance. First aid manual. 1st ed. Colombo 12, D.M. Gunasena,2018.
14. Olugbenga-Bello, A.I., Sunday, O.K., Nicks, B.A., Olawale, O.A., Adefisoye, A.O. First aid knowledge and application among commercial inter-city drivers in Nigeria. *African Journal of Emergency Medicine*. 2012; 2(3). DOI: 10.1016/j.afjem.2012.06.003
15. UNICEF. Education for every child. 2020. Available at: https://www.unicef.org/nigeria/education [Accessed: 19 April 2024].
16. Pallavisarji, U., Gururaj, G., Nagaraja, G. R. Practice and Perception of First Aid Among Lay First Responders in a Southern District of

India. *Archives of Trauma Research*. 2013;1(4):155–60. DOI: 10.5812/atr.7972.

17. Priyangika, K. G. G., Hettiarachchi, M. Knowledge, Attitudes and Practices on First Aid Measures among Senior School Prefects in Galle Education Division, Sri Lanka. *Proceedings72 of 8th International Research Conference KDU* 2015:36–41. Available at: http://www.kdu.ac.lk/proceedings/irc2015/2015/ahs-008.pdf
18. Karyś, J., Rębak, D., Karyś, T., Kowalczyk-Sroka, B., Maćkowski, M. Knowledge of first aid in road traffic accidents among drivers from the Staszów County. *Archives of Physiotherapy and Global Researches*. 2014;18(1):29–33. DOI: 10.15442/apgr.19.2.4.
19. Adelborg, K., Thim, T., Secher, N., Grove, E.L., Løfgren, B. Benefits and shortcomings of mandatory first aid and basic life support courses for learner drivers. *Resuscitation*. 2011; 82(5):614–7. DOI: 10.1016/j.resuscitation.2010.12.018.
20. Solanki, H., Awasthi, S., Pamei, G., Kaur, A., Bhatt, M. Knowledge, attitude, and practice of first aid among the commercial drivers in the Kumaon region of India. *Journal of Family Medicine and Primary Care*. 2019; 8(6):1994-1998. DOI: 10.4103/jfmpc.jfmpc_295_19.
21. LBO, 1990 Suwaseriya ambulance service now covers entire nation. 2019. Available at:https://www.lankabusinessonline.com [Accessed 07 November 2019].