

Knowledge and practice of pre-hospital care after a road traffic injury among three-wheel drivers and associated factors in selected police areas in Colombo district.

Nawarathna SNAM^{1#}, Goonewardena CSE²

*1Department of Nursing and Midwifery, Faculty of Allied Health Sciences, University of Sri Jayewardenepura,
Gangodawila, Nugegoda, Sri Lanka*

*2Consultant Community Physician/ Professor in Community Medicine, Faculty of Medical Sciences,
University of Sri Jayewardenepura, Gangodawila, Nugegoda, Sri Lanka*

#<amalimaduwanthi7550@gmail.com>

Abstract- Globally, the number of road traffic deaths remains unacceptably high. However, effective pre-hospital services can minimize many crash consequences. Usually, basic pre-hospital care is delivered by a lay first responder, mostly another driver. The aim of this study is to describe the knowledge and practice of pre-hospital care after a road traffic injury among three-wheel drivers and associated factors in selected police areas in Colombo district, Sri Lanka. A community based descriptive cross-sectional study was carried out in Kollupitiya, Bambalapitiya, and Kirulapona police areas. A sample of 384 three-wheel drivers registered in above police areas were recruited using simple random sampling method. Structured pre-tested interviewer administered questionnaire was used for data collection. Descriptive analysis was used to determine level of knowledge and practices regarding pre-hospital care. To identify the associated factors for knowledge and practice chi-square test was used. SPSS version 25 was used for data entry and analysis. Ethical approval was obtained from Ethics Review Committee, Faculty of Medical Sciences, University of Sri Jayewardenepura. Only 31.5% of the drivers had first aid training. Even though majority (52.9%) of the drivers had good knowledge, 65.2% had poor practice towards pre-hospital care. Advanced age and having a first aid training

were significantly associated with the good knowledge ($p < 0.05$). Drivers with a previous first aid training within last ten years, having less hires per day and having good knowledge were significantly associated with better first aid practice. Although knowledge regarding pre-hospital care was adequate, practice of pre-hospital care was inadequate.

Key words: Pre hospital care, Knowledge, Practice, Road traffic accidents

Extended Abstract

Introduction

Injury, an increasingly significant public health issue worldwide, accounts for up to 16% of the global burden of disease. Approximately 1.35 million people die each year as a result of road traffic crashes. Between 20 and 50 million more people suffer non-fatal injuries, with many incurring a disability as a result of their injury (WHO, 2018). 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 Crashes (Wimalaratne et al., 2017). Prevention and control of RTIs require multi-sectoral integrated actions aiming at limiting the occurrence of crashes, providing best possible care in the event of a crash and

suitable rehabilitation services for the injured person. However, it is often possible to minimize crash consequences by providing effective pre-hospital services promptly. Prehospital services are a continuum of activities at the crash site and till the injured person is adequately managed by hospital staff (Mpombo and Mwanakasale, 2018). There are ample medical evidences 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. In many communities, the most basic level of prehospital trauma care is provided by laypeople known as “first responders” (Teshale and Alemu, 2017). 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 and taxi drivers) who are usually untrained (Mpombo and Mwanakasale, 2018). Frequently the first person on the scene is more likely to be another driver and have more chance to be the first responder. So, by encouraging local people including drivers to learn and practice the elements of pre hospital care system, we can create a group of first responders. Thus, we can develop an effective pre hospital care system which can save many lives and reduce many disabilities. So, this study was conducted aiming to describe the knowledge and practice of pre hospital care after a road traffic injury among three-wheel drivers and associated factors in selected police areas in Colombo district, Sri Lanka.

Methodology

A community based descriptive cross-sectional study was carried out in Kollupitiya, Bambalapitiya, and Kirulapona police areas in Sri Lanka. In the Colombo Municipal Council administrative area, Colombo district, there are three DIG areas (Deputy Inspector General of Police). They

are Colombo North, Colombo south and Colombo Central DIG areas. 22 police areas are included in these 3 DIG areas and there are 7 police areas in the Colombo south DIG area. From that, 3 police areas namely Kirulapone, Bambalapitiya, Kollupitiya in Colombo South DIG areas were selected to this study. A sample of 384 three-wheel drivers registered in above police areas were recruited using simple random sampling method after obtaining a sample framework of registered three-wheel drivers from united three-wheel drivers’ associations in each police area. Proportion of drivers to be taken from each police area were calculated according to probability proportionate to size, so that final sample of 422 is obtained with 10% non-response rate. A structured pre-tested interviewer administered questionnaire was used for data collection. The questionnaire was pre tested among 15 three-wheel drivers in Wellawatta police area. Content and face validity done by an expert in the field of trauma. Descriptive analysis was used to determine level of knowledge and practices regarding pre hospital care. Chi-square test was used to identify the associated factors for knowledge and practice of pre hospital care. SPSS version 25 was used for data entry and analysis. Ethical approval was obtained from Ethics Review Committee, Faculty of Medical Sciences, University of Sri Jayewardenepura. All the relevant information about the study was explained and the approval was obtained from the police stations in Kirulapone, Bambalapitiya, Kollupitiya.

Results and Discussions

A total of 384 three-wheel drivers responded to the study which resulted in a response rate of 90.1% where 151 (39.3%), 121 (31.5%), and 112 (29.2%) respondents participated to the study from Kollupitiya, Kirulapona and Bambalapitiya police divisions respectively. 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 males. Mean years of driving experience was 11.05 (± 8.67) years ranging from 1 year to 39 years. All the respondents in the study were full

time three-wheel drivers. Majority had education level up to ordinary level (O/L) (n=212, 55.2%).

Table 1: Frequency distribution of the first aid training status of the participants

Characteristics	Number (%)
First aid training	
Yes	121 (31.5%)
No	263 (68.5%)
Years since last training (N=121)	
1-5	52 (43%)
6-10	27 (22.3%)
11-15	12 (9.9%)
16-20	12 (9.9%)
>20	18 (14.9%)

Table 2: Overall distribution of knowledge regarding pre-hospital care after a road traffic accident

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

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. The mean knowledge score of study participants was 28.02 (SD \pm 8.43). Those who scored above mean was categorized as having good knowledge and those who scored below mean was categorized as having poor knowledge. Above table 2 shows that the majority (>50%) of the respondents had good overall knowledge regarding pre-hospital care after road traffic accidents.

Majority 248 (64.6%) had good knowledge to identify signs of air way problem. The similar results were observed in the Olubenga-Bello, et al (2012) and around 70% of the participants identified noisy breathing and fast breathing as respiratory problems in

both studies. On the contrary, a study conducted in India with 252 commercial drivers stated that only 16.3% were aware of signs of airway problems (Awasthi et al., 2019).

Table 3: Overall distribution of knowledge regarding important aspects of pre hospital care.

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	73 (45.1%)	211 (54.9%)
Spinal cord injury	92 (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%)

This observed difference in result might be due to only few of the drivers (1.2%) in the Indian study have obtained first aid training.

Less than 50% of the subjects had good knowledge regarding management of an unresponsive patient who is not breathing and management of a patient who is breathing yet unresponsive. Only one third of the respondents (n=149, 38.8%) knew that cardio-pulmonary resuscitation (CPR) should be given when the patient is unconscious and not breathing. Less than 50% of the subjects had good knowledge regarding management of a patient with bleeding, factors to consider when transporting the patient to a hospital. Emergency telephone number was known by only 41.1% of the subjects in present study and this was observed even lesser among children care givers in the study of Gunawardhana and Goonewardena (2017), which was 21.5%. This might be due to the three-wheel drivers being spending more

time in the roads and often see emergency ambulance.

In current study, 333 (86.7%) has a witnessed road traffic accident within the past one year, out of that majority (n=249, 74.8%) has attended to a road traffic victim. Practices regarding pre-hospital was determined using 9 statements which states actions taken during a 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 labeled as having a good practice and those who scored below that was classified as having poor practice. Majority 217 (65.2%) had poor practice while only 116 (34.8%) had good practice towards pre- hospital care after RTA.

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

Charact eristics	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%)

In the present study, only 26.9% had called an ambulance. On the contrary, 41.5% of the respondents of the study Pallavisarji, Gururaj and Girish (2013) had called an ambulance in a RTA. In Sri Lanka, 1990 Suwaseriya ambulance service covers the entire country to expand the country's pre-hospital emergency care service (LBO, 2019). 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. Majority 132 (53%) had moved patients from accident site to a safer place but only 25 (10%) had made sure that patients' airway is clear and only 31 (12.4%) has checked whether patient is breathing properly. Even though first aid knowledge about the fracture immobilization was the highest (80.5%), only 17 (6.8%) of the participants had been concerned regarding stabilizing a fracture. Even though majority (n=172, 69.1%) has taken RTA victim to a hospital, only 61 (24.5%) had ensured safe positioning while taking the patient to a hospital. Regarding the type of first aid provided, in this study, only 16.5% took actions to control bleeding which was much less than Gunawardhana and Goonewardena (2017) study in Sri Lanka and this might be due to it is being conducted among care givers of children where they are more considerate towards their own child's situation.

Majority (59.5% and 53.6%) in the present study has stated that lack of confidence due to inadequate knowledge and legal complications that follow later were the major reasons for not attending to a 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 (2013) 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. However, lack of first aid box has been the main reason for the majority of drivers (74.3%) in the study conducted by Teshale and Alemu (2017) in Ethiopia. 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%,) was seen in the study by Gunawardhana and Goonewardena (2017). In the current study,

only 34.8% had good practice towards pre hospital care after a RTA. So, it is observed that practice towards pre hospital care was generally poor in this study.

Majority of the respondents who were above 45 years of age, 107 (60.8%) had better knowledge than who were below 45 years of age and it was statistically significant ($X^2 = 8.202$, $p = 0.004$ and $OR = 1.809$, $CI = 1.204 - 2.719$). The majority of the respondents who had first aid training had better knowledge ($n = 105$, 86.1%) than who did not have a first aid training 98 (37.4%). This observed difference was highly significant ($X^2 = 79.101$, $P < 0.001$, $OR = 10.336$, $CI = 5.844 - 18.281$). 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 (2017) which was conducted in Sri Lanka among care givers of children stated that first aid knowledge was significantly associated with the education level.

The majority of the respondents who had first aid training ($n = 45$, 42.5%) had better practice than who did not have a first aid training 69 (30.4%). This observed difference was statistically significant ($X^2 = 4.665$, $p = 0.03$, $OR = 1.689$, $CI = 1.048 - 2.724$). This finding was supported by the study conducted by Teshale and Alemu (2017) in Ethiopia where delivering first aid was five times more likely among trained drivers than those who were not. Those who had the training within last ten years had a better first aid practice ($n = 35$, 52.2%) than those who had the training before 10 years ($n = 10$, 27.0%). This observed difference was statistically significant ($X^2 = 6.172$, $p = 0.013$, $OR = 2.953$, $CI = 1.238 - 7.046$). It seems like, even though they had a training, with time, they reduce their confidence in performing

pre- hospital care. Those who have more hires per day ($n = 86$, 29.7%) were less likely to provide pre hospital care for a RTA victim than who drive less hires per day ($n = 28$, 65.1%). This observed difference was highly significant ($X^2 = 20.915$, $p = 0.000$, $OR = 4.428$, $CI = 2.253 - 8.704$). Furthermore, respondents who had good knowledge ($n = 77$, 43.0%) showed to have a better practice than those who had poor knowledge ($n = 37$, 24.0%). This observed difference was statistically significant ($X^2 = 13.260$, $p < 0.001$, $OR = 2.387$, $CI = 1.487 - 3.833$).

Conclusions

Less than one third of the respondents in the study, had attended to some form of first aid training. More than half of the respondents in the study had good knowledge regarding pre hospital care after a RTA. 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. The study identified inadequate knowledge and legal complications that follows later as factors that would prevent three-wheel drivers from providing first aid to an RTA victim. Even though knowledge regarding pre-hospital care among three-wheel drivers was adequate, overall practice of pre-hospital care was inadequate. After witnessing a RTA, transporting the RTA victim was the main action taken by majority of the participants. Three-wheel drivers' knowledge regarding pre hospital care was significantly associated with being at an age of more than 45 years and having a training ($p < 0.05$) while factors such as ethnicity, driving experience, level of education, marital status, and number of trips per day had no significant association with it ($p > 0.05$). Having a previous first aid training, training within last ten years, having less hires per day (< 10) and good knowledge regarding pre hospital care had significant association with good practice of pre hospital

care after a RTA ($p < 0.05$). Factors such as Age, ethnicity, marital status, driving experience, level of education had no significant association with it ($p > 0.05$). Hence it is recommended that first aid training should be given on a regular basis and be made mandatory before issuing a driving license to all three-wheel drivers. Also, increasing the publicity of existing pre hospital care number and other important emergency numbers within the population, establishing clear regulations and legislation addressing the issues of a first aid providers taking actions at the scene are recommended.

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