

Assessing First Aid and CPR Proficiency and Related Factors among Traffic Police Officers in Managing Road Traffic Injuries in Colombo District, Sri Lanka

T. M. H. S. Amaratunge¹, N. P. Edirisinghe^{2*} and A. A. T. D. Amarasekara¹

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

²*Department of Fundamental Nursing, Faculty of Nursing, University of Colombo, Sri Lanka*

Abstract

Road traffic injury (RTI) has become an increasingly significant public health issue and one of the leading causes of death among children and young adults. Traffic police officers can play an essential role in providing first-aid and cardiopulmonary resuscitation (CPR) for the victims promptly minimizing the consequences in RTI. This study aims to determine the knowledge, attitudes, and practices related to first aid and CPR in road traffic injuries (RTIs), and the influencing factors for these outcomes, among traffic police officers in the Colombo District, Sri Lanka. A descriptive cross-sectional study was conducted among consecutively selected police officers (n=148) with one year of experience. A pre-tested (n=10) self-administered questionnaire with 88 items was used to collect the data. Chi-square tests

*Correspondence should be addressed to **Dr. N. P. Edirisinghe**, Department of Fundamental Nursing, Faculty of Nursing, University of Colombo, Sri Lanka.

Email: niroshae@fnd.cmb.ac.lk

 <https://orcid.org/0000-0002-1546-2705>

(Received 11th March 2025, Revised 05th May 2026, Accepted 20th May 2026,
© OUSL)



This article is published under the Creative Commons Attribution-Share Alike 4.0 International License (CC-BY-SA). This license permits use, distribution and reproduction in any medium; provided it is licensed under the same terms and the original work is properly cited.

were used to determine the associated factors with the level of practice. The ethical approval was granted for this study by the Ethics Review Committee, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka. Most of the males belonged to the age group of 21-30 years with work experience of 1- 4 years. Among the participants, 38%, 54%, and 8% of the traffic police officers had an excellent, good, and poor level of knowledge, respectively. Furthermore, 96% of the traffic police officers had a poor level of practice. Level of practice was found to be associated with attitude, work experience, first-aid training, gender, and age. In conclusion, despite good theoretical knowledge, traffic police officers demonstrated poor first-aid and CPR practice, underscoring the urgent need for structured, hands-on training programs to bridge the gap between knowledge and real-world performance.

Keywords: *knowledge, practices, first-aid, CPR, associated factors, traffic police officers*

Introduction

Road traffic injuries (RTIs) represent a major global public health challenge, placing a substantial burden on health systems worldwide. According to the World Health Organization (WHO), RTIs account for approximately 1.19 million deaths each year globally (WHO, 2023). RTIs are also responsible for approximately 1.35 million combined deaths and disabilities annually, and by 2030, they are projected to become the seventh leading cause of death globally (Ahmed et al., 2023). The burden is disproportionately concentrated in low- and middle-income countries (LMICs), which account for 93% of all RTI-related deaths, representing an estimated 1.3 million fatalities in 2019 (Ahmed et al., 2023). RTIs are now the leading cause of death among children and adolescents aged 5–19 years, with 115,843 deaths recorded in 2019, accounting for 7.8% of all deaths in this age group (Liu et al., 2022). Pedestrians, cyclists, and motorcyclists are the most common victims of more than half of the deaths related to RTIs. In addition to fatalities, an estimated 20 to 50 million people sustain non-fatal injuries each year, many resulting in long-term disability. These injuries impose a significant economic burden, costing countries approximately 3% of their gross domestic product (GDP) through treatment costs, loss of productivity, and long-term care (WHO, 2023).

RTIs are among the leading causes of death in Sri Lanka, which has the worst road fatality rate among its immediate South Asian neighbours (Ministry of Health, 2021; World Health Rankings, 2021). De Silva et al. (2018) reported over 3,000 RTI-related deaths annually, while Devasurendra et al. (2017) documented 2,440 deaths in 2014. The absence of a well-established pre-hospital care system further compounds the severity of these injuries (Gunawardhana & Goonewardena, 2016). As noted by Razzak et al. (2016), the lack or poor quality of trauma care systems in LMICs contributes substantially to higher RTI fatality rates. Pre-hospital care, defined as the initial medical assistance provided before hospital arrival, aims to preserve life, prevent further injury, and promote recovery (Wilson et al., 2015). Effective pre-hospital care significantly improves survival outcomes in trauma, cardiac arrest, and RTI (Bedard et al., 2020). According to WHO (2023), inadequate post-crash care remains a key contributor to increased injury severity in RTIs.

In the absence of a structured pre-hospital care system, immediate assistance through first aid and CPR is particularly critical, especially from bystanders and first responders such as traffic police officers. First aid has been defined as the assessment and interventions that can be performed by bystanders with minimal or no medical equipment (International Federation of Red Cross and Red Crescent Societies, 2020). The American Heart Association defines CPR as an emergency lifesaving procedure performed when the heart stops beating (American Heart Association, 2024). WHO and previous research have consistently emphasized the importance of providing first aid and CPR promptly at RTI scenes, as such interventions can double or triple a person's chance of survival in life-threatening emergencies (Eisenberg et al., 2014; Peden, 2004).

Although first responders in some LMICs receive no formal training, police officers in Sri Lanka, including traffic police officers, receive basic first-aid and CPR instruction as part of their initial police training programme. However, no ongoing or role-specific refresher training is provided for traffic police officers, despite evidence that such training is essential for maintaining first-responder competence. CPR skills and knowledge begin to deteriorate within six to twelve months of formal basic life support training, with motor skills decaying more

rapidly than theoretical knowledge (Al Jadidi & Al Jufaili, 2023). Studies on first responders in workplace settings have further shown that those who had renewed their certification on more than one occasion performed significantly better than those trained only once (Anderson et al., 2011). Evidence from randomized controlled trials indicates that refresher training intervals should not exceed seven months to prevent significant skill loss (Woollard et al., 2006). The Australian Resuscitation Council similarly recommends that CPR skills be refreshed annually and first-aid qualifications renewed every three years (Australian Resuscitation Council, 2022). Despite this evidence, refresher training for traffic police officers in Sri Lanka has not been formalised as a mandatory or structured component of their role; a critical gap in national pre-hospital care preparedness.

Traffic police officers play a vital role in the pre-hospital care phase of RTIs, often being among the first to arrive at crash scenes (Soori et al., 2009). Assessing their proficiency in providing first aid and CPR is therefore essential. While several studies have examined first-aid knowledge among police officers in Sri Lanka, very few have focused specifically on traffic police officers. This study aimed to determine the knowledge, attitudes, practices, and associated factors related to first aid and CPR among traffic police officers in the Colombo District, Sri Lanka, with the goal of informing targeted training interventions and national pre-hospital care policy.

Methodology

Study design and setting

A quantitative, descriptive, cross-sectional study was conducted between December 2021 and February 2022. The study was carried out in the Colombo District, which comprises six police divisions: Colombo North, Colombo South, Colombo Central, Nugegoda, Mount Lavinia, and Kelaniya. Three divisions were randomly selected for the study. From each selected division, ten police stations were randomly chosen in proportion to the number of traffic police officers stationed there.

Participants

Traffic police officers currently working in the Colombo District with at least one year of working experience were eligible for inclusion. The

minimum sample size was calculated using the population size correction factor, yielding a calculated sample size of 264. Participants who met the inclusion criteria were selected using a consecutive sampling approach.

Study instrument

In the absence of a validated standard questionnaire, a self-administered questionnaire was developed by the researchers after an extensive and intensive literature review. The content validity of the questionnaire was assessed by one senior nursing academic and one senior staff nurse working in the Accident and Emergency Unit with 03 years of experience as a first-aid and CPR trainer and a provider of a tertiary care hospital. Face validity was evaluated among 10 traffic police officers prior to conducting the main study. The questionnaire consisted of four sections, 'Socio-Demographic Data' (11 items), 'Knowledge Regarding First-Aid and CPR' (55 items), 'Attitude Regarding First-Aid and CPR' (13 items), and 'Practices Regarding First-Aid and CPR' (09 items). Knowledge was assessed using questions with the response options of 'true', 'false', or 'don't know'. Attitudes were measured using a 5-point Likert scale with options ranging from 'strongly agree' to 'strongly disagree'. Practice was evaluated using 'yes' or 'no' response options.

Data collection

Data were collected by the principal investigator using the self-administered questionnaire. The study was explained to participants using both verbal and written information through an information sheet, and written informed consent was obtained from each participant prior to questionnaire administration.

Data Analysis

Descriptive statistics were used to summarize and present data. Chi-square tests were conducted to determine the significance of categorical variables in identifying factors influencing first-aid and CPR practices.

For the knowledge questions in Part 2, each correct answer for each statement carried 1 mark. Each incorrect or 'didn't know' answer carried 0 marks. In total, there were 55 statements; total possible

knowledge score was 55. Those who scored 75% or above were considered to have excellent knowledge. Those who scored 50% - 74% were considered to have good knowledge. Those who scored 0% - 49% were considered to have poor knowledge (Reddy et al., 2021). The response “strongly agree” was amalgamated with the response “agree” and was given 2 marks. The response “Neutral” was given 1 mark. The response “strongly disagree” was amalgamated with the response “disagree” and was given 0 marks. Marks were given depending on the positivity and negativity of each statement. The total score was 26, as there were 13 statements. The mean score was calculated by using the total score. Those who scored equal or above the mean score were considered to have a positive attitude, and those who scored below the mean score were considered to have a negative attitude.

For the questions regarding the practices in total, 24 marks were given. Those who scored 75% or above were considered to have excellent practice. Those who scored 50% - 74% were considered to have good practice. Those who scored 0% - 49% were considered to have poor practice (Reddy et al., 2021).

Ethical considerations

In accordance with the Declaration of Helsinki, ethical approval was granted for this study by the Ethics Review Committee (ERC), Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka (Nur/02/21). The data was collected after obtaining informed written consent. Anonymity and confidentiality were maintained throughout the study. Identification numbers were provided to each of the study participants instead of obtaining names or contact details in the data collection forms and the master dataset. Data were only used for research purposes and were password secured, accessible only to the principal investigator and the supervisor. All participants had the full privilege to withdraw from the study at any given time.

Results

A total of 220 questionnaires were distributed to traffic police officers across ten police stations in three divisions of the Colombo District. Among the potential participants, 72 declined or withdrew, and a final sample of 148 completed questionnaires was obtained, representing a response rate of 67%.

The majority of the participants (128, 45.9%) were in the 21 - 30 years age group, while the minority of 4 (2.7%) were in the 50 - 60 years age group. Furthermore, most participants (132, 89.2%) were male Police Constables (PC)s and all female participants were Women Police Constables (WPCs). There were 82 (55.4%) participants who had received in-service refresher training in first aid and CPR; that is, training was undertaken after their initial police training programme. However, 66 (44.6%) reported no additional training during their tenure.

Knowledge of First Aid

Most participants demonstrated good knowledge of basic first-aid principles such as calling for help (131, 88.5%), moving the patient to safety (137, 92.6%), and ensuring a clear airway (130, 87.8%). However, only 53.4% (n=79) correctly identified the head-tilt and chin-lift method for opening the airway, and 45.9% (n=68) knew that chest compression is a key component of CPR. Knowledge was notably lower in specific lifesaving procedures, as shown in Table 1.

Table 1. *Knowledge of First Aid (n=148)*

First aid after an RTA	Correct answer		Incorrect answer	
	N	%	N	%
Is the first and immediate assistance given to a person at the site of an accident?	125	84.5%	23	15.5%
Lifesaving interventions should be given within the 1 st hour	33	22.3%	115	77.7%
Should be given in the hospital	110	74.3%	38	25.7%
Should initiate immediately	141	95.3%	7	4.7%
Components of First-aid				
Calling for help	131	88.5%	17	11.5%
Calling an ambulance	135	91.2%	13	8.8%
Moving the patient from the accident site to a safer place	137	92.6%	11	7.4%
Making sure that the patient's airway is clear	130	87.8%	18	12.2%

Making sure that the patient is breathing properly	122	82.4%	26	17.6%
Stop bleeding	126	85.1%	22	14.9%
Splinting fractures	107	72.3%	41	27.7%
Safe positioning of the patient	138	93.2%	10	6.8%

What should be done if the victim is not responding and not breathing

Open the airway by head tilt and chin lift method	79	53.4%	69	46.6%
Check whether the patient is breathing (look, listen, and feel)	115	77.7%	33	22.3%
Offering him/her some water/other beverage to drink	93	62.8%	55	37.2%
If not breathing, start CPR (cardiopulmonary resuscitation)	104	70.3%	44	29.7%
Components of CPR: Chest compression	68	45.9%	80	54.1%
Components of CPR: Artificial breathing	88	59.5%	60	40.5%
Artificial breathing should be given: Mouth-to-mouth	138	93.2%	10	6.8%
Artificial breathing should be given: Mouth to nose	96	64.9%	52	35.1%

What should be done when the patient is breathing normally and not responding

Look for other life-threatening wounds or conditions	37	24.8%	111	75.2%
keep the patient's face and body downwards and slightly to the sides	36	24.3%	112	75.7%
Start CPR immediately	105	70.9%	43	29.1%
Offering water/other beverages to drink	98	66.2%	50	33.8%

Knowledge of bleeding and stopping bleeding

According to Table 2, most participants correctly identified pale, cool, clammy skin as a sign of bleeding (n=137, 92.6%). However, none recognized a weak and fast pulse with increased breathing as another key sign (0%). Knowledge of correct bleeding control methods was moderate, with only 57.4% (n=85) knowing how to apply pressure and clean the wound, and 54.1% (n=80) aware of proper nosebleed management steps.

Table 2- *knowledge of bleeding and stopping bleeding (n=148)*

Signs of bleeding	Correct answer		Incorrect answer	
	N	%	N	%
Pale, cool, clammy skin	137	92.6%	11	7.4%
Weak and fast pulse and increased speed of breathing	0	0.0%	148	100.0%
Apply tourniquet				
Apply pressure and clean the dressing	85	57.4%	63	42.6%
Keep the injured limb below the heart level	52	35.1%	96	64.9%
Initial management of a nosebleed includes: Have the victim lean forward, apply gentle pressure on nostrils, and apply a cold towel	80	54.1%	68	45.9%

Knowledge of spinal code injuries

Most participants correctly identified visible or external signs of spinal cord injury such as external wounds (n=124, 83.8%), change in spinal shape (n= 115, 77.7%), and loss of sensation (n= 116, 78.4%), but critically failed to recognize neurological signs — only 10.8% (n= 16) knew that loss of control over arms or legs indicates spinal injury. In terms of management, three-quarters knew the importance of keeping

the patient still (n= 111, 75%) and correctly opening the airway using the jaw thrust method (n= 114, 77%), which is appropriate when spinal injury is suspected. However, over 40% (n=62) failed to support the head, neck, and spine in alignment, revealing a key knowledge gap in safe immobilisation techniques, as shown in Table 3.

Table 3. *Knowledge of spinal cord injuries (n=148)*

Identification of spinal cord injury	Correct answer		Incorrect answer	
	N	%	N	%
Spinal cord injury can be suspected if there are,				
Wound or pain in the neck/back	101	68.2%	47	31.8%
change of normal shape of the vertebral column	115	77.7%	33	22.3%
External wound associated with the vertebral column	124	83.8%	24	16.2%
Lack of control over arms or legs	16	10.8%	132	89.2%
Change or loss of sensation	116	78.4%	32	21.6%
Breathing difficulties	103	69.6%	45	30.4%
Managing a victim with suspected spinal cord injury				
A victim with a suspected spinal cord injury should be managed by,				
Keeping the patient still	111	75.0%	37	25.0%
Supporting the head so that the head, neck, and vertebral column are in line	86	58.1%	62	41.9%
Open the airway by keeping the fingertips at the two ends of the jaw and open the airway by raising the jaw without tilting the head (jaw thrust)	114	77.0%	34	23.0%
Use head tilt and chin lift method to open the airway	97	65.5%	51	34.5%

Lifting/moving the patient alone, without assistance.	111	75.0%	37	25.0%
Keeping the patient still	111	75.0%	37	25.0%

Knowledge of performing CPR

Most participants correctly identified basic vital sign parameters such as pulse rate (n=125, 84.5%) and pulse detection sites (n=131, 88.5%), indicating good fundamental knowledge. However, knowledge regarding CPR specifics, such as chest compression landmarks (n=27, 18.2%) and breathing rate (n= 62, 41.9%), was notably poor, revealing significant gaps in CPR knowledge as shown in Table 4.

Table 4. *Knowledge on performing CPR (n=148)*

Knowledge on performing CPR	Correct answer		Incorrect answer	
	N	%	N	%
The easiest sites for the detection of the pulse are the neck and wrist	131	88.5%	17	11.5%
The pulse rate is 60-100 in an adult in one minute	125	84.5%	23	15.5%
Normal breathing rate is 12-20 for an adult in one minute	62	41.9%	86	58.1%
The best position for the victim to be in when you are performing CPR is laying the victim supine on a relatively hard surface	105	70.9%	43	29.1%
The landmark for chest compressions for an adult is the left side of the chest	27	18.2%	121	81.8%
While performing chest compressions, you should keep your shoulders directly over your hands and your elbows should be locked	112	75.7%	36	24.3%

The depth of compression in adults during CPR is 2 to 2.5 inches	90	60.8%	58	39.2%
The ratio of chest compressions: to breathing in adults is 30:2	75	50.7%	73	49.3%
It's compulsory to give mouth-to-mouth breathing when providing CPR	69	46.6%	79	53.4%
Cessation of CPR is done only when assistance has arrived	69	46.6%	79	53.4%

Level of knowledge by demographic characteristics

Table 5 shows that most participants with first-aid training, positive attitudes, and A/L education demonstrated higher knowledge levels. Male and younger participants (21–30 years) showed better knowledge compared to females and older age groups. Poor knowledge was mainly observed among those without training and with negative attitudes.

Table 5. *Level of knowledge by demographic characteristics (n=148)*

Characteristic		Excellent		Good		Poor	
		N	%	N	%	N	%
Gender	Male	44	31.2%	78	55.3%	19	13.5%
	Female	0	00.0%	2	28.6%	5	71.4%
Rank	PC	44	33.3%	73	55.3%	15	11.4%
	PS	0	0.0%	5	55.6%	4	44.4%
	WPC	0	00.0%	2	28.6%	5	71.4%
Education	O/L	8	15.4%	31	59.6%	13	25.0%
	AL	38	41.8%	47	51.6%	6	6.6%
	Di-ploma/ Degree	0	0.0%	0	0.0%	5	100.0%
	Yes	50	61.0%	21	25.6%	11	13.4%

First-aid training	No	13	19.7%	25	37.9%	28	42.4%
Attitude	Negative	17	28.3%	13	21.7%	30	50.0%
	Positive	65	73.9%	16	18.2%	7	8.0%
Work Experience	1 - 4 Years	41	35.0%	56	47.9%	20	17.1%
	5 - 8 Years	1	14.3%	6	85.7%	0	0.0%
	9 - 12 Years	4	18.2%	14	63.6%	4	18.2%
	> 12 years	0	0.0%	2	100.0%	0	0.0%
Age Group	21-30 years	42	34.4%	61	50.0%	19	15.6%
	31-40 years	4	23.5%	12	70.6%	1	5.9%
	41-50 years	0	0.0%	5	100.0%	0	0.0%
	51-60 years	0	0.0%	0	0.0%	4	100.0%

Practice of First-aid and CPR

Almost all the participants (98.5%) had witnessed RTIS during their tenure. Among them, 72.4% of the participants (134) have claimed they had provided some form of first-aid or CPR assistance to a victim of an RTI. Only 02 participants who witnessed an RTI claimed that they did not assist. From the participants who claimed to have assisted a victim in an RTI (n= 134), the majority (48, 35.8%) claimed that they have assisted a victim of an RTI once a month, while the minority (11, 8.2%) have mentioned their frequency of assistance as few times a week. For the level of practice, based on the scoring criteria described in the Methods section (0–49% = poor; 50–74% = good; ≥75% = excellent), no one had been able to have a score of more than

75%. Thus, no one had an excellent level of practice. More than 90% of the participants (134) had poor practice, whilst only 9.5% (14) of the participants had a good level of practice.

Tasks performed in RTIS were assessed among participants who reported having assisted a victim of an RTI ($n = 134$). According to Table 6, more than 90% ($n=121$) of the participants who had assisted a victim of an RTIS have called for help and splinted fractures. In contrast, only 5 participants (3.7%) claimed they moved the victim from the accident site to a safer place. In addition, there were only 5 respondents who claimed that they took action to stop bleeding.

Table 6. Tasks performed in an RTI ($n=134$)

Tasks	Yes		No	
	N	%	N	%
Called for help	121	90.3%	13	9.7%
Called an ambulance	84	62.7%	50	37.3%
Moved patient from accident site to a safer place	5	3.7%	129	96.3%
Made sure that the patient's airway was clear.	28	20.9%	106	79.1%
Performed CPR	83	61.9%	51	38.1%
Made sure that the patient is breathing properly	74	55.2%	60	44.8%
Took action to stop bleeding	5	3.7%	129	96.3%
Splinted fractures	94	70.1%	40	29.9%
Performed safe positioning	80	59.7%	54	40.3%

Attitudes towards performing first-aid and CPR

Based on the scoring method described in the Methods section, participants who scored equal to or above the mean (≥ 21.84 out of 26)

were classified as having a positive attitude. The majority of participants (88; 59.5%) had a positive attitude, while 60 (40.5%) had a negative attitude. According to Table 7, a total of 131 participants (88.5%) had a positive attitude towards calling an ambulance and providing first aid to a victim of RTI. Most of the respondents (94, 63.5%) had a positive attitude towards checking the presence of injuries and providing CPR. There were no respondents who were not willing to provide first-aid or CPR due to legal complications and fear of blood. Most respondents had a neutral opinion regarding not willing to provide first-aid or CPR due to the fear that germs would enter their bodies. Further, most of the participants (84, 56.8%) had a neutral opinion regarding having sufficient knowledge of first aid and CPR.

Table 7. *Attitudes toward performing first-aid and CPR (N=148)*

Statements	Disagree		Neutral		Agree	
	N	%	N	%	N	%
If I witness an RTI, I am willing to call an ambulance and provide first-aid for the victims	0	0.0%	17	11.5%	131	88.5%
If I witness an RTI, I am willing to call an ambulance but I'm not willing to provide first-aid for the victims	121	81.8%	15	10.1%	12	8.1%
In an RTI, I am willing to check the presence of injuries and provide CPR if necessary	24	16.2%	30	20.3%	94	63.5%
In an RTI, I am willing to shift the patient to a safer place to prevent further injuries	22	14.9%	20	13.5%	106	71.6%

I'm not willing to provide help due to legal complications that follows later	131	88.5%	17	11.5%	0	0.0%
I am not willing to provide first-aid because I'm afraid that I may cause harm than helping the victim	49	33.1%	80	54.1%	19	12.8%
I am not willing to provide CPR as I'm afraid I may cause harm than helping the victim	95	64.2%	49	33.1%	4	2.7%
I am not willing to provide First aid or CPR because I am scared that germs will enter to my body	63	42.6%	76	51.4%	9	6.1%
I am not willing to provide first aid or CPR because I'm afraid of blood	121	81.8%	27	18.2%	0	0.0%
I think providing first-aid CPR should only be done by a healthcare professional	126	85.1%	17	11.5%	5	3.4%
I'm not willing to provide help due to legal complications that follow later	136	91.9%	7	4.7%	5	3.4%
I think my knowledge of first aid and CPR is sufficient.	31	21.0%	84	56.8%	33	22.3%
I think traffic police officers must be trained to provide first aid and CPR	5	3.4%	17	11.5%	126	85.1%

Factors associated with the practice of first-aid and CPR

According to Pearson Chi-Square test results as shown in Table 8, gender ($p=0.04$), rank ($p=0.01$), education level ($p=0.01$), first-aid and CPR training ($p=0.04$), work experience ($p=0.04$), and age ($p=0.01$) were significantly associated with good CPR and first-aid practice ($p < 0.05$). Participants who had received formal CPR training had longer work experience (9–12 years) and were in mid-age groups (41–50 years) demonstrated better practical performance. Although knowledge did not show a significant association, a positive attitude toward first aid and CPR was significantly linked to good practice ($p = 0.01$), highlighting the importance of motivation and mindset in improving real-life performance.

Table 8. *Factors associated with the level of first-aid and CPR practice (N=148)*

Factor	Category	df	χ^2	p-value
Gender	Male / Female	1	4.218	0.040
Rank	PC / PS / WPC	2	9.210	0.010
Education level	O/L / A/L / Diploma	2	9.211	0.010
Ongoing First-aid and CPR training	Yes / No	1	4.217	0.040
Work experience	1–4 / 5–8 / 9–12 / >12 yrs	3	8.311	0.040
Age group	21–30 / 31–40 / 41–50 / 51–60	3	11.345	0.010
Attitude	Positive / Negative	1	6.635	0.010
Knowledge level	Excellent / Good / Poor	2	-	>0.05

Note. $p < 0.05$ (statistically significant)

Discussion

This study examined the knowledge, attitudes, practices, and influencing factors related to first aid and CPR among traffic police officers in the Colombo District. The findings revealed a notable discrepancy between the officers' theoretical knowledge and their practical skills, with practice levels substantially lower despite adequate knowledge. Several demographic and professional factors were associated with practice performance, indicating that practical competence can be shaped by a combination of training exposure, experience, and individual attitudes. These key findings will guide the subsequent interpretation and comparison with existing literature.

Knowledge

In the present study, just over half of the participants (55.4%) had previously received in-service refresher training in first aid and CPR, that is, training undertaken in addition to the basic first-aid instruction provided during the initial police training programme. This coverage was notably lower than the 85.8% reported among Sri Lankan traffic police officers in the Colombo and Gampaha Districts (James et al., 2017) and the 65.3% among Tanzanian traffic police officers with post-crash first-aid training (Lukumay et al., 2018). These variations likely reflect differences in training accessibility, institutional prioritisation, and policy enforcement across different settings and time periods.

Overall, the majority of participants demonstrated a good level of knowledge (54%), with 38% achieving excellent knowledge and only 08% performing poorly. These results are broadly consistent with findings from India, where Nekar et al. (2020) reported that 60.2% of traffic police had adequate knowledge of first aid and 71.3% were aware of first-aid kit contents and application. Participants with prior in-service training showed a higher proportion of excellent knowledge compared to untrained peers, reinforcing the established relationship between training and knowledge acquisition in emergency response.

In terms of specific knowledge strengths, calling for help, airway management, and patient positioning were well understood. This aligns with Ndile et al. (2020), who identified these as the most consistently retained skills among Tanzanian traffic police following a structured post-crash training programme. Visible external signs of spinal cord

injury, including wounds associated with the vertebral column, changes in spinal shape, and loss of sensation, were also well recognized, which is clinically significant given the WHO's (2013) emphasis on timely pre-hospital recognition of spinal injury to prevent secondary disability. Pulse detection and normal pulse rate were similarly well-known (88.5% and 84.5%, respectively), consistent with findings among Korean police officers.

However, several critical knowledge gaps were identified. Only 22.3% of participants correctly identified that lifesaving interventions should be initiated within the first hour of injury: the "golden hour" concept. This finding is consistent with reports from India and Ethiopia, where awareness of the golden hour was similarly poor among transport workers despite its well-established clinical relevance (Nekar et al., 2020; Yigzaw et al., 2025). Recognition of neurological signs of spinal cord injury was critically low, with only 10.8% identifying loss of control over the arms or legs as an indicator of a near-complete knowledge gap that the WHO (2013) identifies as a key component of safe pre-hospital management. None of the participants (0%) recognized a weak and fast pulse with increased breathing rate as a sign of significant bleeding, mirroring findings from Tanzania where traffic police reported managing bleeding victims largely through guesswork (Ndile et al., 2020). The chest compression landmark was correctly identified by only 18.2%, consistent with evidence that correct hand placement is among the most difficult CPR skills to retain without regular hands-on practice. The compression-to-ventilation ratio of 30:2 was known by only 50.7%, despite its status as a standard guideline reaffirmed by the American Red Cross (2021). The normal adult breathing rate was correctly identified by only 41.9%, a gap similarly documented among Tanzanian traffic police prior to training (Ndile et al., 2020). Lower knowledge levels were generally observed among officers aged 41–50 years, consistent with findings by James et al. (2017) and attributable in part to age-related decline in memory retention (Andersen et al., 2016).

Attitudes

The majority of participants held a positive attitude towards providing first aid and CPR. Most expressed willingness to call an ambulance and assist RTI victims, and 63.5% were willing to check for injuries

and provide CPR. Importantly, no participant cited fear of legal consequences or fear of blood as reasons for unwillingness to act, barriers that have been prominently reported in other studies. Most participants held neutral views regarding whether germs might enter their body during CPR (51.4% neutral) and about the sufficiency of their own knowledge (56.8% neutral), suggesting a degree of uncertainty that may inhibit confident action in practice. The majority agreed that traffic police officers should receive formal first-aid and CPR training, reflecting an awareness of the need for capacity building. These positive attitudinal findings are consistent with reports from Nepal (Smart et al., 2022), India (Nekar et al., 2020), and Tanzania (Lukumay et al., 2018), where willingness to help was generally high among police officers despite practical skill deficiencies.

Practice

In this study, "practice" refers to assessed practical competence, measured through a scored questionnaire, and is conceptually distinct from the frequency with which participants reported performing first-aid tasks at RTI scenes. Despite 90.5% of the participants having witnessed an RTI and 72.4% reporting that they had assisted a victim, over 90% were classified as having poor practice competence based on the scoring criteria. No participant achieved an excellent level of practice. This substantial knowledge-practice gap is a critical finding.

Similar patterns have been reported internationally. Reddy et al. (2021) assessed practice competence among police officers in southern India and similarly reported poor performance despite adequate theoretical knowledge. In Nigeria, Ogunyemi et al. (2021) documented significantly lower rates of first-aid task performance among police officers compared to those in high-income countries, a related but conceptually distinct measure of practical engagement. Locally, James et al. (2017) observed that nearly half of Sri Lankan police officers under 30 years of age did not perform first aid during RTIs, though this represents practice frequency rather than skill competence.

The gap between knowledge and practice may be attributed to several factors: inadequate hands-on training, lack of self-confidence, fear of causing harm, misconceptions about first-aid responsibilities, and

limited access to equipment. Notably, only 13.4% of participants reported carrying a first-aid kit while on duty, and even those who did found essential items such as clean cloths and scissors to be absent. Similar equipment shortages were identified as key barriers to effective practice by Ndile et al. (2020) in Tanzania. These findings collectively highlight the urgent need for both practical training and improved logistical support.

Factors associated with practice

Gender, rank, education level, in-service first-aid and CPR training, work experience, age group, and positive attitude were all significantly associated with the level of practice ($p < 0.05$). Knowledge level, however, was not significantly associated with practice ($p > 0.05$), contrasting with findings from India, where Nekar et al. (2020) reported a significant knowledge-practice relationship. This divergence suggests that in the present study context, practical competence is shaped more strongly by attitudinal, experiential, and structural factors than by knowledge alone.

The significant role of in-service training in predicting practice is well-supported in the literature. Ndile et al. (2020) identified training exposure as the primary facilitator of first-aid skill use among Tanzanian traffic police, and a post-crash first-aid educational programme was found to significantly improve both knowledge and skills confidence. Positive attitude was also a significant predictor of practice in this study, consistent with findings from multiple studies (Nekar et al., 2020; Lukumay et al., 2018; Widodo et al., 2017) that identify attitude as a major determinant of first-aid and CPR performance. Work experience, age, gender, rank, and education level may influence practice through differential exposure to training opportunities, seniority-based access to decision-making at crash scenes, and accumulated practical exposure over time. Smart et al. (2022) similarly highlighted external factors such as competing duties and bystander interference as barriers to first-aid practice among police in Nepal.

Limitations

Several limitations should be considered when interpreting these findings. Data collection was affected by officers' limited availability, delays in questionnaire completion, and some incomplete responses.

The COVID-19 pandemic and a period of political instability in Sri Lanka disrupted fieldwork and contributed to a reduced final sample relative to the calculated sample size, though a response rate of 67% was achieved. The consecutive sampling approach, while pragmatic, may introduce selection bias. The study used a researcher-developed questionnaire; although content and face validity were assessed, these were limited to two expert reviewers — a small number that constrains the depth of the validation process. Generalizability beyond the Colombo District should therefore be approached with caution. Finally, the cross-sectional design precludes causal inference.

Implications and recommendations

These findings highlight the urgent need to strengthen first-aid and CPR preparedness among Sri Lankan traffic police officers. Practical skill deficiencies persist despite prior training, suggesting that initial training alone is insufficient and that regular, structured refresher programmes are essential. Consistent with evidence from randomized controlled trials (Woollard et al., 2006) and expert guidelines (Australian Resuscitation Council, 2022), refresher training should occur at least annually and ideally at intervals, not exceeding seven months. Training programmes should be simulation-based, hands-on, and tailored to the specific RTI scenarios that traffic police encounter regularly. Officers should also be routinely equipped with adequately stocked first-aid kits. At the policy level, ongoing first-aid and CPR refresher training should be formalized as a mandatory, role-specific requirement for traffic police officers in Sri Lanka. Addressing the knowledge gaps identified particularly in relation to the golden hour, chest compression technique, and recognition of haemodynamic signs of bleeding, should be prioritized in curriculum design. Fostering positive attitudes and building officer-confidence through supportive training environments will further translate knowledge into effective field performance.

Conclusions

This study demonstrated that while the majority of Sri Lankan traffic police officers possessed a generally good level of theoretical knowledge about first aid and CPR, significant gaps remained in critical life-saving areas, notably recognition of the golden hour concept, haemodynamic signs of bleeding, neurological indicators of spinal

cord injury, and the correct chest compression landmark. More concerning was the substantially poor level of practical competence, with 90.5% of participants classified as having poor practice and very few officers carrying a first-aid kit while on duty, highlighting a pronounced discrepancy between knowledge and real-world readiness.

Positive attitude was significantly associated with better practice, indicating that motivation and willingness to act are as important as theoretical knowledge in determining effective first-aid response. Demographic and professional factors, including work experience, in-service first-aid training, gender, rank, and age, were also significantly associated with practice levels, suggesting that both individual attributes and institutional factors shape readiness to intervene at RTI scenes.

These findings underscore the urgent need for structured, recurrent, and simulation-based training programmes, coupled with the provision of adequate first-aid equipment and the development of clear institutional policies mandating ongoing refresher training for traffic police officers. Addressing these gaps is essential to improving the capacity of traffic police officers to deliver timely and effective pre-hospital care, and to ultimately reduce RTI-related morbidity and mortality in Sri Lanka.

Acknowledgments

The authors, with great respect, appreciate the cooperation extended by the administrative officials of the respective police divisions and all the study participants.

Competing interests

The authors declare that they have no financial or other substantive competing interests that may be construed to influence the results or interpretation of their research. This research did not receive any specific grant from funding agencies in the public, commercial, or non-profit sectors.

References

Ahmed, S. K., Mohammed, M. G., Abdulqadir, S. O., El-Kader, R. G. A., El-Shall, N. A., Chandran, D., Rehman, M. E. U., & Dhama,

- K. (2023). Road traffic accidental injuries and deaths: A neglected global health issue. *Health science reports*, 6(5), e1240. <https://doi.org/10.1002/hsr2.1240>
- Al Jadidi, H., & Al Jufaili, M. (2023). Effectiveness of a Short Refresher Course on the Retention of Cardiopulmonary Resuscitation-Related Psychomotor Skills (REF-CPR). *Oman medical journal*, 38(3), e509. <https://doi.org/10.5001/omj.2023.80>
- American Heart Association. CPR & First Aid Emergency Cardiovascular Care. (2024). <https://cpr.heart.org/en/>
- American Red Cross Scientific Advisory Council. (2021). Focused Updates and Guidelines 2021: Healthcare Provider. American Red Cross. <https://www.redcross.org>
- Andersen, J.P., Pitel, M., Weerasinghe, A., & Papazoglou, K. (2016). Highly realistic scenario based training simulates the psychophysiology of real world use of force encounters: Implications for improved police officer performance. *Journal of Law Enforcement*, 5(4). <http://www.jghcs.info/index.php/1/article/view/461>
- Anderson, G. S., Gaetz, M., & Masse, J. (2011). First aid skill retention of first responders within the workplace. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 19(1), 11. <https://doi.org/10.1186/1757-7241-19-11>
- Australian Resuscitation Council. (2022). Guidelines on CPR and First Aid Refresher Training. <https://resus.org.au/guidelines/anzcor-guideline-updates-2021/>
- Bedard, A. F., Mata, L. V., Dymond, C., Moreira, F., Dixon, J., Schauer, S. G., Ginde, A. A., Bebarta, V., Moore, E. E., & Mould-Millman, N. K. (2020). A scoping review of worldwide studies evaluating the effects of prehospital time on trauma outcomes. *International journal of emergency medicine*, 13(1), 64. <https://doi.org/10.1186/s12245-020-00324-7>
- Cherkos, A. (2014). *Assessment of knowledge, Attitude and practice Toward First aid related to Road Traffic Accidents Among Traffic Police in Lideta, Kirkos and Arada Sub City of Addis Ababa, Ethiopia*. (Doctoral dissertation, Addis Ababa University).
- Devasurendra, K., Perera, L., & Bandara, S. (2017). An insight to motorized two and three wheel crashes in developing countries: A

- case study in Sri Lanka. *Journal of Transportation Safety & Security*, 9(sup1), 204–215.
<https://doi.org/10.1080/19439962.2016.1236052>
- Mpombo, D. A. K., & Mwanakasale, V. (2017). Assessment of knowledge, attitude and practice of first aid amongst minibus drivers, conductors and road traffic police officers in Ndola, Zambia. *Asian Pac J Health Sci*, 4, 121-8.
<https://doi.org/10.21276/apjhs.2017.4.3.20>
- Eisenberg, M. S., Bobrow, B. J., & Rea, T. (2014). Fulfilling the Promise of “Anyone, Anywhere” to Perform CPR. *JAMA*, 311(12), 1197–1198. <https://doi.org/10.1001/jama.2014.1485>
- Gunawardhana, G. and Goonewardena, S. (2016) ‘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*, 21(1), 49-60.
<https://doi.org/10.4038/jccpsl.v21i1.8076>
- International Federation of Red Cross and Red Crescent Societies (2020). *International First Aid, Resuscitation, and Education Guidelines 2020*. Geneva: IFRC, 2020. <https://www.ifrc.org>
- James, K. A. R., Nazeer, A. A. A., Perera, M. P. H., Tissera, S. R., & Silva, S. N. (2017). A study on knowledge and practices of first aid and CPR among police officers in Colombo and Gampaha. *Berichte der Bundesanstalt fuer Strassenwesen. Unterreihe Fahrzeugtechnik*, (117).
- Liu, L., Villavicencio, F., Yeung, D., Perin, J., Lopez, G., Strong, K. L., & Black, R. E. (2022). National, regional, and global causes of mortality in 5-19-year-olds from 2000 to 2019: a systematic analysis. *The Lancet. Global health*, 10(3), e337–e347.
[https://doi.org/10.1016/S2214-109X\(21\)00566-0](https://doi.org/10.1016/S2214-109X(21)00566-0) 1]
- Lopez, A. D., Mathers, C. D., Ezzati, M., Jamison, D. T., & Murray, C. J. (2006). Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. *Lancet (London, England)*, 367(9524), 1747–1757.
[https://doi.org/10.1016/S0140-6736\(06\)68770-9](https://doi.org/10.1016/S0140-6736(06)68770-9)
- Lukumay, G. G., Ndile, M. L., Outwater, A. H., Mkoka, D. A., Padyab, M., Saveman, B. I., & Backteman-Erlanson, S. (2018). Provision of post-crash first aid by traffic police in Dar es Salaam, Tanzania: a cross-sectional survey. *BMC emergency medicine*, 18(1), 45. <https://doi.org/10.1186/s12873-018-0199-9>

- Markeson, D., Ferguson, J. D., Chameides, L., Cassan, P., Chung, K. L., Epstein, J., Gonzales, L., Herrington, R. A., Pellegrino, J. L., Ratcliff, N., & Singer, A. (2010). Part 17: first aid: 2010 American Heart Association and American Red Cross Guidelines for First Aid. *Circulation*, 122(18 Suppl 3), S934–S946.
<https://doi.org/10.1161/CIRCULATIONAHA.110.971150>
- Ministry of Health. RTAs Part I. (2021) *Weekly Epidemiology Report*. 48(7):1-2.
- Ndile, M. L., Lukumay, G. G., Bolenius, K., Outwater, A. H., Saveman, B. I., & Backteman-Erlanson, S. (2020). Impact of a postcrash first aid educational program on knowledge, perceived skills confidence, and skills utilization among traffic police officers: a single-arm before-after intervention study. *BMC emergency medicine*, 20(1), 21. <https://doi.org/10.1186/s12873-020-00317-y>
- Ndile, M. L., Saveman, B. I., Lukumay, G. G., Mkoka, D. A., Outwater, A. H., & Backteman-Erlanson, S. (2020). Traffic police officers' use of first aid skills at work: a qualitative content analysis of focus group discussions in Dar Es Salaam, Tanzania. *BMC emergency medicine*, 20(1), 72.
<https://doi.org/10.1186/s12873-020-00368-1>
- Nekar, M.S., Bant, D.D., & Kumar, S.B. (2020). Knowledge, Attitude, and Practice Regarding First Aid among Traffic Police of Hubballi-Dharwad. *Annals of Community Health*, 8, 41-46.
- Ogunyemi, K.O., Venkatraman, C., Malolan, C., Olaomi, O.O., & Nwariaku, F. (2021). Police experiences of bystander assistance in pre-hospital care of road traffic accident victims in Abuja, Nigeria: a cross-sectional study. *The Lancet Global Health*, 9.
- Peden, M., Weltgesundheits organization, & Welt bank (Eds.). (2004). World report on road traffic injury prevention. World Health Organization.
- Razzak, J. (2016). 31 Developing and evaluating trauma care systems in low- and middle-income countries (LMICs): experiences in africa. Injury Prevention.
<https://doi.org/10.1136/INJURYPREV-2016-042156.30>
- Reddy, G., Kothakulangara, G., Thapar, R., Holla, R., & Kumar, N. (2021). Assessment of the Level of Knowledge of First Aid and Basic Life Support among the Police Workforce in a Coastal Area in Southern India. *Journal of Natural Science, Biology and Medicine*, 12(1), 47.
https://doi.org/10.4103/jnsbm.JNSBM_122_20

- Silva, A. D., Tennakoon, A., Hanas, A., & Jayatilleke, A. U. (2018). PW 2511 Road traffic fatalities in sri lanka: An analysis of autopsy reports. *Injury Prevention*, 24(2), A193.
<https://doi.org/10.1136/injuryprevention-2018-safety.532>
- Smart, G., Banstola, A., Raut, R., Ghimire, K., Mytton, J., Joshi, E., & Joshi, S. (2022). Post-Crash First Response by Traffic Police in Nepal: A Feasibility Study. *International journal of environmental research and public health*, 19(14), 8481.
<https://doi.org/10.3390/ijerph19148481>
- Soori, H., Royanian, M., Zali, A. R., & Movahedinejad, A. (2009). Road traffic injuries in Iran: the role of interventions implemented by traffic police. *Traffic injury prevention*, 10(4), 375–378.
<https://doi.org/10.1080/15389580902972579>
- Widodo, W., Sumardino, S., & Rifai, A. (2017). Competence of the Civil Service Police Unit (CSPU) in providing Emergency First Aid Assistance. *Jurnal Ners*, 12(2), 296.
- Wilson, M. H., Habig, K., Wright, C., Hughes, A., Davies, G., & Imray, C. H. (2015). Pre-hospital emergency medicine. *Lancet (London, England)*, 386(10012), 2526–2534.
[https://doi.org/10.1016/S0140-6736\(15\)00985-X](https://doi.org/10.1016/S0140-6736(15)00985-X)
- Woollard, M., Whitfield, R., Newcombe, R. G., Colquhoun, M., Vetter, N., & Chamberlain, D. (2006). Optimal refresher training intervals for AED and CPR skills: a randomized controlled trial. *Resuscitation*, 71(2), 237–247.
<https://doi.org/10.1016/j.resuscitation.2006.04.005>
- World Health Organization. (2013). Spinal cord injury: International perspectives. WHO Press. <https://www.who.int/news/item/02-12-2013-spinal-cord-injury-as-many-as-500-000-people-suffer-each-year>
- World Health Organization. *Road Traffic injuries*. (2023).
<https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries>
- World Health Rankings. *HEALTH PROFILE: SRI LANKA*. (2021).
<https://www.worldlifeexpectancy.com/country-health-profile/sri-lanka>