

ORIGINAL ARTICLE

Experiences and Interventions by Botswana police officers in providing emergency care in road traffic collisions in the greater Gaborone region

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ABSTRACT

Background: Close to 500 people die annually from Road Traffic Collisions in Botswana. The country's Emergency Medical Service is limited in capacity and coverage and greatest in the region of the capital city, Gaborone. Botswana Police Service officers are often first responders to the incidents and provide first aid, however the extent of their interventions and their experiences has not been studied.

Methods: A questionnaire based cross-sectional survey was conducted in January 2016 on a sample of 99 officers on past pre-hospital care training, attitudes towards providing pre-hospital care for accident victims, the number of road traffic collision related deaths and injuries encountered in the last 6 months, their interventions to the victims and limitations encountered in providing care.

Results: The officers self-reported attending to a median of 10 injured victims (IQR = 5 – 20) and a median of 2 deaths (IQR = 0 – 4) in the preceding 6 months. The officers generally acknowledged their role and responsibility to provide pre-hospital care to the victims. Officers frequently secured accident scenes and transported injured victims to health facilities. They rarely performed haemorrhage control on victims, performed any airway manoeuvres or splint injured limbs. The major limitations to providing care were lack of first aid supplies and personal protective equipment, lack of knowledge and skills to provide care and interference from onlookers at accident scenes.

Conclusion: Botswana Police officers in the greater Gaborone area attend to a considerable number of traffic related injuries and fatalities. These results support many opportunities for educational interventions to add value to pre-hospital care.

Introduction

Deaths from trauma occur in the pre-hospital setting in countries of all economic levels, however Africa and the developing world have significantly higher burden [1,3]. Studies have demonstrated that lack of pre-hospital care systems contributes to death and disability in the region [4–6]. Trauma deaths occur as a result of airway compromise, respiratory failure or uncontrolled haemorrhage, all the three conditions can be readily treated using basic first aid measures [5]. Botswana has an annual average of approximately 20 000 Road Traffic Collisions (RTC) responsible for 450 – 550 deaths per year [7,8]. Statistical models by Mphela et al. indicated that increased exposure (i.e. the frequency of travel and distances travelled), and population growth are the leading causes of road fatalities in Botswana [9]. Another possible contributing factor could be the restricted Emergency Medical Services (EMS) in

Botswana. Government funded EMS was initiated in 2013 and still has limited country coverage; private EMS providers are situated mainly in urban centres [10] leaving large areas of the country still without coverage (see appendix A). Any geographic or logistical void in Botswana's EMS coverage is frequently filled by the Botswana Police Services (BPS) as they are still regarded as first responders in non-traumatic and trauma related events, even in settings where there are well established EMS [11,12]. This study sought to establish baseline data on the frequency and the pattern of the interaction of the officers and RTC trauma victims in Botswana, as well as investigate the attitudes of BPS towards their role in provision of emergency pre-hospital trauma care. Information from this study is hoped to influence support and education of possible acceptable interventions for BPS in their role as first responders.

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Methods

The study was a questionnaire-based survey on a sample of 100 officers from six policing districts around the capital city Gaborone. The sample represented 11.3% of all officers assigned to the Traffic Branch of the BPS (total of 876), while the 6 policing districts selected accounted for 64% of all RTCs in Botswana between 2006 and 2012 [13]. The selection of the officers was a convenience selection by the Head of Traffic Branch, without any formal randomization. The selected officers were sent an invitation to voluntarily participate in a two-part study where the initial part of the study was data collection (addressed in this publication) while the second part was a free basic prehospital training course offered by the researchers (to be addressed in a separate publication). The officers were free to choose to take part in any of the two exercises or choose neither. Those who wished to take part in the study were given time off their usual duties and transported to the University of Botswana where training and data collection was performed. Prior ethical clearance had been obtained from the Ethics Review Boards of the University of Botswana (UB) and Ministry of Health and Wellness (MoHW). Signed informed consent was obtained from all the participants and the head of the BPS. The study questionnaires were filled anonymously and individual responses to questionnaire were not shared with the BPS.

Officers were given a questionnaire to explore their perceptions, frequency, and experiences in providing pre-hospital trauma care to RTC victims over the past 6 months. This questionnaire was based on the questionnaire used in a study by Jayawaran et al. [14] Modifications required by the author for the local context included exploring if individuals were squeamish at the sight of blood or hesitant to provide first aid to injured victims. These issues were included amongst the options as possible limitations to providing pre-hospital care. The questionnaire covered basic demographics of the officers, past first aid training (or any pre-hospital care training) and duration since training, past experiences, and limitations in providing pre-hospital care. It was administered in English as proficiency in English is a prerequisite for joining the BPS.

The questionnaire had five-point agree/disagree and six-point frequency Likert scale questions, structured numerical response questions and single word or short answer questions (app. B). The questionnaire was administered in January 2016 in a classroom setting by the researchers. The officers had unlimited time to complete the questionnaire and generally completed the questionnaire in less than 30 min. The data from the questionnaire was then transcribed into Microsoft Excel™ 2016. Statistical data analysis was performed using Stata™ 14 software. Numerical data was tested for normality using the Shapiro-Wilk test and median used for non-normally distributed data and mean calculated for normally distributed data. Manual thematic grouping was done for qualitative data from the single word and short answer question, and all data tabulated using Microsoft Excel™ 2016.

Results

Of the 100 invited officers, 99 (99%) opted to participate in the survey. 79.8% ($n = 79$) of the participants were male and 20.2% ($n = 20$) were females. The single officer opted out as participation was not compulsory. The median age of the officers was 35 years (IQR = 32 – 42). The officers reported that they attended to a median of 10 (IQR = 5 – 20) injured victims of RTCs in the last six months and a median of two deaths (IQR = 0 – 4). Seventy-eight (75.8%) of the officers had experienced first aid training, and the mean number of years since training was 9.2 years (SD +/- 6.4). Of the 78 participants who had previous training only 18.4% ($N = 14$) was within the last 3 years.

Experience and attitudes towards provision of pre-hospital care

Eighty-eight percent (88%) of officers 'strongly agreed/agreed' they have a responsibility to provide pre-hospital care to injured victims of

RTC (Fig. 2). The most performed interventions were securing crash sites and transporting of victims to health sites. Fifty-five percent (55%) of the officers 'very frequently' or 'frequently' secured crash sites compared to 26% who 'occasionally or rarely' and 18% 'very rarely' or 'never', while for transportation of victims to hospital the responses were 48%, 38% and 13% respectively (Fig. 1). The least performed interventions were airway manoeuvres, haemorrhage control and splinting where the responses were 9%, 36%, 54% and 7%, 18%, 75% and 5%, 12%, 83% respectively when clustered as 'very frequently/frequently', 'occasionally/rarely' and 'very rarely/never' (Fig. 1).

Limitations to providing care

The most frequently reported limitations to providing care were lack of equipment and PPE and lack of knowledge, where 89% and 63% respectively of officers 'strongly agreed/agreed' these were limiting factors. The officers indicated that they were less likely to be impeded by scene safety or by being squeamish at the sight of blood and injuries, or feeling that it was not their responsibility; 60%, 75% and 78% respectively 'disagree/strongly disagree'. The un-structured responses for limitations to providing care are tabulated on Table 1. The most significant limitation (or reasons for not providing care) recorded was interference from spectators at the accident scene, shortage of manpower or that other first responders were providing medical care.

Discussion

Deaths and injuries encountered

This survey indicates that the BPS self-report a considerable number of injuries and deaths from RTCs and provide pre-hospital care. A median of 2 deaths and 10 injuries per officer in 6 months is comparable to the findings in Uganda (1 – 5 deaths) although that study included non-RTC deaths [14]. Botswana is one of the most sparsely inhabited countries in Africa [15] and yet these RTC death and injury figures are higher than a similar Tanzanian self-reported police survey [16]. Since this study only reports injuries and deaths related to RTCs, it likely gave only a partial picture of all potential BPS encounters with deaths and injuries.

Previous pre-hospital training and attitudes towards providing care

A proportion of participants had previous training in pre-hospital care or first aid (75.8%) at varying times. The lack of standardisation and refresher courses for first aid training is not uncommon in low resource settings, and is unhelpful [17,18] as trainees are unlikely to retain skills if there are no refresher trainings. First aid skills that are not up to date and appropriate to their setting are unlikely to be used in practice and can easily be lost.

The acceptance by the BPS that they have a role in provision of emergency pre-hospital care is encouraging. The acceptance by lay responders that they have a role in providing emergency care is not unique to BPS; In Tanzania, Lukumay et al. found 96% of the traffic police officers had a positive attitude towards providing post-crash first aid [16]. These findings were also echoed by Malawian community focus groups as described by Chokoto et al. [19]. The acceptance by lay responders that they have a role in providing prehospital care in emergencies will assist in achieving the WHO resolution WHA72.16, recommending strengthening both informal and formal prehospital care systems to promote timely care of acutely ill and injured persons [2].

Frequency and patterns of interventions in RTC trauma

This cross-sectional survey also investigated the frequency and types of interventions in pre-hospital care of RTC trauma victims. The BPS secured accident scenes and transported the injured to healthcare

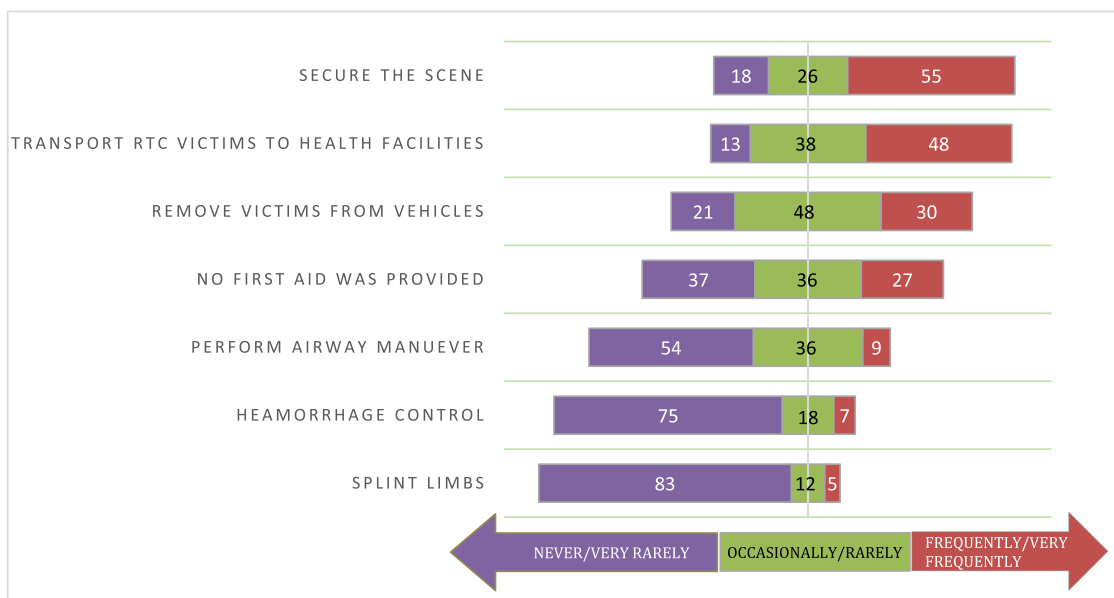


Fig. 1. Experiences and Patterns of Providing Care by BPS.

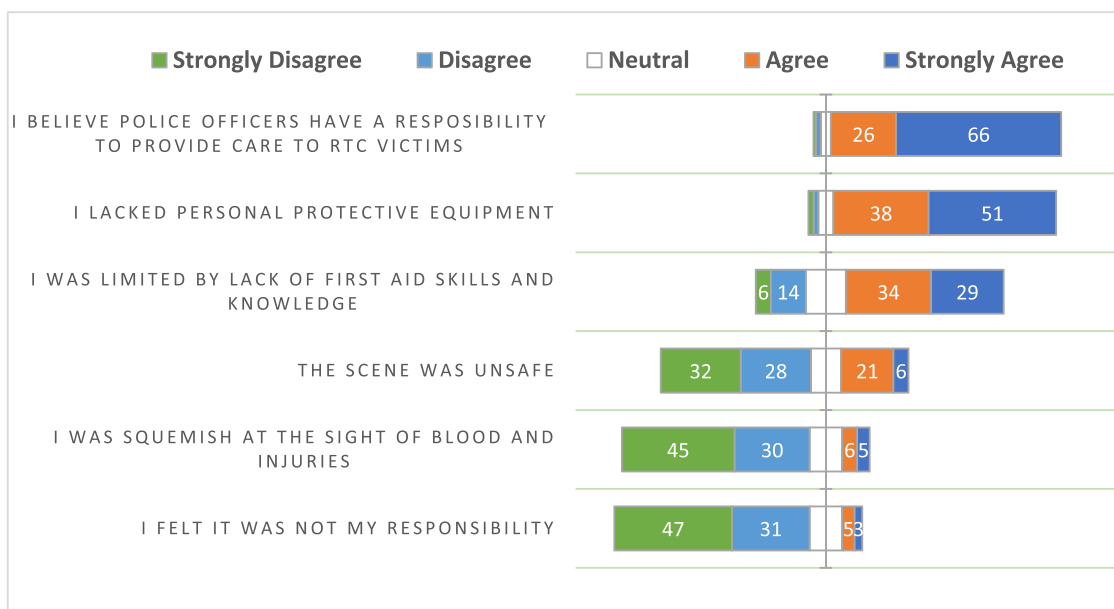


Fig. 2. Attitudes and Limitations to Providing Care.

Table 1
Limitations/Reasons for not Providing Care.

Limitations/Reasons for not Providing Care (Unstructured Responses)	Number of Responses ^a
Interference from Spectators	33
Other First Responders Already Providing Care	18
Manpower Shortage	18
Lack of self-Confidence in Providing Care	6
Concerns about Litigation	4
Inadequate Counselling Services	3
Fear of Causing Further Harm	2
Unsuitable of Police Vehicles for Patient Transport	1

^a Some officers gave more than one limitation, while others gave no responses, therefore the total number of responses does not equate to sample size.

facilities (55% and 48% “very frequently/frequently” respectively); The former is part of their training and main responsibility in the setting of a well-established EMS, however transporting injured victims requires safe extrication, safe lifting, and positioning during transportation. An additional challenge for the BPS is the unsuitability of their patrol vehicles to transport an injured victims as indicated in their unstructured responses to the limitations to providing care (Table 1). A study of Thailand Royal Police uncovered poor knowledge amongst officers on handling and transportation of injured victims to the hospitals [20], while in another Tanzanian study, transportation to hospital by police officers was associated with poor outcome [21]. While it is unrealistic to expect the BPS to convert their patrol vehicles into ambulances, upskilling them in safe handling and transportation of injured victims could ensure that this process is safer.

The study also found that the BPS infrequently performed any airway manoeuvres (jaw thrusts, chin-lift or placement in recovery position).

This is consistent with the findings of Lukumay et al. and Shrestha et al. on Tanzanian and Thai police respectively; the former found both poor knowledge and self-reported practice while the latter found poor knowledge of simple airway manoeuvres [16,20]. Recognising the need and then performing a low input intervention such as placing a victim in a recovery position may have a significant bearing on their outcomes. More research is recommended to explore the reasons for this low level of intervention in these instances.

Haemorrhage control interventions by officers were infrequently reported in this study, which contrasts with other comparative studies in Tanzania, Thailand, and Uganda [14,16,20]. Haemorrhage and its related complications have negative impacts on patient outcomes but simple interventions such as pressure dressing can prevent haemorrhagic shock and its complications [5]. It is encouraging that Jayaraman et al. found a statistically significant improvement in the frequency of performing haemorrhage control amongst lay responders after a basic first aid training [22].

The survey also indicated that officers infrequently immobilized injured or broken limbs. While splinting a limb usually has less bearing on survival compared with a compromised airway, early repositioning and splinting is necessary to reduce pain, prevent haemorrhage and can reduce risk of fat embolism in some fractures [23].

Limitations/reasons for not providing care

The survey determined that the most important limitations for providing pre-hospital by the BPS were lack of first aid supplies, equipment, as well as lack of skills and knowledge of pre-hospital trauma care. This was comparable to the findings in Uganda, where the most common reported reasons for not aiding were lack of knowledge and equipment [14]. In a follow up study in Uganda, the lack of skill and knowledge was addressed by the context-appropriate skills and knowledge training as well as the use of improvised supplies and equipment to assist in addressing the shortage of first aid supplies and equipment [22]. A similar approach could be used for the BPS, including supplementing the improvised equipment with a small first aid kit.

The matter of interference from spectators has been described as a barrier to provision of pre-hospital care in Iran [24] and is likely a problem in other settings with developing EMS. The solution to this is possibly to turn these crowds into allies. This could be based on the work done by Sun et al. in Cape Town where lay members of the public were trained in a context-appropriate training in pre-hospital care skills and integrated into the EMS system [25].

Study limitations

The small convenience sample from urban specific areas will not be representative of the whole BPS, leading to findings that cannot be generalized for the whole of Botswana. The sample was from mainly urban areas with the highest concentration of RTC in Botswana, so the experiences of sampled officers may not necessarily reflect those of the officers from more rural areas. Conversely, the greater Gaborone area has the highest concentration of EMS providers in the country [10], therefore an argument can be made that because of this, officers are less likely to administer pre-hospital medical care than their counterparts in outlying areas of Botswana. The questionnaire administered in this study is not a validated tool and had modifications by the researchers to suit local setting. Despite these limitations, the findings gave a much-needed baseline information and areas for further research on the nature of the interaction between the officers and injured RTC victims.

Conclusions

The BPS in greater Gaborone attend to a considerable number of RTC related trauma and deaths, reflecting the country's still limited EMS and burden of RTC trauma. Intervention by officers has the potential to save

lives but has challenges related to limited resources as well as knowledge and skills to provide pre-hospital care. There are opportunities to add value to the interventions by addressing these limitations.

Dissemination of results

This study was designed as a Master of Medicine (Emergency Medicine) Dissertation at the University of Botswana (UB). The study was therefore submitted and published in the University of Botswana library in accordance with the UB policies. The results were also shared with the main stakeholder, the Botswana Police Services.

Authors' contribution

Authors contributed as follow to the conception or design of the work; the acquisition, analysis, or interpretation of data for the work; and drafting the work or revising it critically for important intellectual content: MS contributed 75% and MC 25%. All authors approved the version to be published and agreed to be accountable for all aspects of the work.

Declaration of Competing Interest

The authors declared no conflicts of interest.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.afjem.2023.08.004](https://doi.org/10.1016/j.afjem.2023.08.004).

References

- [1] Delaney PG, Eisner ZJ, Bustos A, Hancock CJ, Thullah AH, Jayaraman S, et al. Cost-Effectiveness of Lay First Responders Addressing Road Traffic Injury in Sub-Saharan Africa. *J Surg Res* 2022;270:104–12.
- [2] WHA72 R. Resolution WHA72. 16. Emergency care systems for universal health coverage: ensuring timely care for the acutely ill and injured Seventysecond World Health Assem Geneva. 2019;28.
- [3] Mock CN, Jurkovich GJ, nii-Amon-Kotei D, Arreola-Risa C, Maier RV. Trauma mortality patterns in three nations at different economic levels: implications for global trauma system development. *J Trauma* 1998;44(5): 804-12; discussion 12-4.
- [4] Mould-Millman NK, Sasser SM, Wallis LA. Prehospital research in sub-saharan Africa: establishing research tenets. *Acad Emerg Med* 2013;20(12):1304–9.
- [5] Varghese M, Sasser S, Kellermann A, Lormand J-D. World Health Organization. Dept. of Injuries and Violence Prevention. Prehospital trauma care systems /editors: Scott Sasser ... [et al.]. Geneva: World Health Organization; 2005. viii, 67 p. p.
- [6] Henry JA, Reingold AL. Prehospital trauma systems reduce mortality in developing countries: a systematic review and meta-analysis. *J Trauma Acute Care Surg* 2012; 73(1):261–8.
- [7] Organization WH. Global status report on road safety 2018. Geneva: Reference Source; 2019. 2018.
- [8] MVA. Motor Vehicle Accident Fund Annual Road Crash and Claims Report 2017. 2017.
- [9] Mphela T. Causes of road accidents in Botswana: an econometric model. 2020. 2020;14.
- [10] Ntaire Caruso AC, Kesler Andrew. Development of Emergency Medicine in Botswana. *Afr J Emerg Med* 2011;1(3):108–12.
- [11] Heightman AJ. Impact of early care: first responder care often makes the difference 2011;36(4):14.
- [12] Ramirez M, Pfeffer AN, Lee G, Slovis CM. Partners in crime. EMS provides a training program for local law enforcement. *JEMS: J Emerg Med Serv* 2012;37(5): 52–5.
- [13] Fund M. Annual Road Crash & Claims Report 2012. 2012.
- [14] Jayaraman S, Mabweijano JR, Lipnick MS, Caldwell N, Miyamoto J, Wangoda R, et al. Current patterns of prehospital trauma care in Kampala, Uganda and the feasibility of a lay-first-responder training program. *World J Surg* 2009;33(12): 2512–21.
- [15] Bank W. Population density (people per sq. km of land area). Botswana: World Bank; 2023 [Available from: <https://data.worldbank.org/indicator/EN.POP.DN.ST?locations=BW>].
- [16] Lukumay GG, Ndile ML, Outwater AH, Mkoka DA, Padyab M, Saveman BI, et al. Provision of post-crash first aid by traffic police in Dar es Salaam, Tanzania: a cross-sectional survey. *BMC Emerg Med* 2018;18(1):45.
- [17] Tiska MA, Adu-Ampofo M, Boakye G, Tuuli L, Mock CN. A model of prehospital trauma training for lay persons devised in Africa 2004;21(2):237–9.

- [18] Geduld H, Wallis L. Taxi driver training in Madagascar: the first step in developing a functioning prehospital emergency care system. *Emerg Med J: EMJ* 2011;28(9): 794–6.
- [19] Chokotho L, Mulwafu W, Singini I, Njalale Y, Maliwichi-Senganimalunje L, Jacobsen KH. First Responders and Prehospital Care for Road Traffic Injuries in Malawi. *Prehosp Disaster Med* 2017;32(1):14–9.
- [20] Shrestha BPO, Boonshuyar C, Shrestha M. Response to road traffic injuries: a survey of Royal Thai Traffic Police in a Northeastern Province of Thailand. *J Public Health Dev* 2017;15(1):101–12.
- [21] Boniface R, Museru L, Kiloloma O, Munthali V. Factors associated with road traffic injuries in Tanzania. *Pan Afr Med J* 2016;23:46.
- [22] Jayaraman S, Mabwejjano JR, Lipnick MS, Caldwell N, Miyamoto J, Wangoda R, et al. First things first: effectiveness and scalability of a basic prehospital trauma care program for lay first-responders in Kampala, Uganda. *PLoS One* 2009;4(9): e6955.
- [23] Collopy KT, Kivlehan SM, Snyder SR. Managing unstable musculoskeletal injuries. *EMS World* 2012;41(2):36–43.
- [24] Alinia S, Khankeh H, Maddah SS, Negarandeh R. Barriers of Pre-Hospital Services in Road Traffic Injuries in Tehran: the Viewpoint of Service Providers. *Int J Community Based Nurs Midwifery* 2015;3(4):272–82.
- [25] Sun JH, Wallis LA. The emergency first aid responder system model: using community members to assist life-threatening emergencies in violent, developing areas of need. *Emerg Med J: EMJ* 2012;29(8):673–8.