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Pre-Hospital and Trauma Care to Road Traffic Accident Victims: Experiences of Residents Living along Accident-Prone Highways in Ghana

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Abstract

Road traffic accidents (RTAs) and associated injuries are a major public health problem in developing countries. The timely emergency pre-hospital care and subsequent transportation of accident victims to the health facility may help reduce the accident and injury outcomes. Available evidence suggests that RTA victims stand a greater chance of survival if attended to and cared for in a timely manner. This exploratory qualitative study set out to explore the experiences of residents of 12 communities along the Kasoa-Mankessim highway in Ghana (an accident-prone highway) in administering emergency pre-hospital care to RTA victims. We utilised data from a purposive sample of 80 respondents (i.e., people who have ever attended to RTA victims) from the communities through structured interview schedules. We found that the majority of the respondents had little knowledge and/or professional training in first-aid and emergency pre-hospital care to RTA victims. The skills and knowledge exhibited were gained through years of rescue services to RTA victims. The “scoop and run” method of first-aid care was predominant among the respondents. We recommend regular community member (layperson first responder) sensitisation and training on emergency pre-hospital care for RTA victims.

Keywords: road traffic accident victims, emergency pre-hospital care, layperson first responders, Kasoa-Mankessim highway, Ghana

1. Introduction

Road traffic accidents (RTAs) are associated with an estimated 1.25 million deaths globally each year with about 50 million others injured in the process [1]. The Ghanaian situation follows a similar trend. An estimated 1800 people are killed in road traffic accidents yearly with almost 14,500 others injured [2].

According to the WHO Global Burden of Disease project 2002, road traffic injuries (RTIs) are the 10th leading cause of death for all age groups globally, accounting for 1,183,492 deaths. More specifically, RTIs is the second and third leading cause of death for persons aged 5–29 years and 30–44 years, respectively [3, 4].

In low- and middle-income countries, RTIs constitute the ninth leading cause of death and the tenth leading cause of disability-adjusted life years (DALYs) [4, 5]. A number of factors account for the high RTIs in these countries including poorly maintained vehicles, inadequate traffic enforcement, inefficient pre-hospital emergency medical response and overburdened healthcare infrastructure [6]. As a result, about 80% of the injury deaths in these countries are said to occur in the pre-hospital setting [7].

Many of these injury deaths could be prevented with the timely arrival of competent emergency pre-hospital medical services at the accident scene [8, 9]. Timely emergency pre-hospital care to traffic accident victims at the accident scene and subsequent transportation to the health facility may reduce the probability of injury severity and deaths. Regarding injury severity and death, trauma experts consider the first 60 minutes (termed the “golden hour”) after the injury occurred as the most important period to save lives. The risk of death or severe injury is believed to increase after this period [10].

Recently, the World Health Organisation has proposed training of layperson first responders as the first essential step in developing Emergency Medical Services systems in settings where the formal pre-hospital system is not available [6, 11]. This system has been found to be effective in reducing traffic accident-induced mortalities in most countries [5, 11–13]. A previous study revealed that about 51% of severely injured persons in Kumasi, Ghana died in a pre-hospital setting (cited in 7). This suggests that improving pre-hospital care to RTA victims is important to reduce “the mortality of critically injured roadway casualties” [7]. This stresses the urgency to establish layperson first responder care systems in Ghana (as proposed by the WHO) where formal pre-hospital care is inadequate. Pre-hospital care and post-crash intervention happen to be the focus of the fifth pillar of the UN Decade of Action of Road Safety 2011–2020 which aims to reduce the anticipated magnitude of RTAs and casualties [14].

1.1 Study objective

Given the important role of layperson first responders in the chances and quality of survival of RTA victims, this study explores the experiences of residents living along the Kasoa-Mankessim road network, an accident-prone road in Ghana, in administering emergency pre-hospital care to RTA victims. We explored their knowledge of pre-hospital first-aid and trauma care and the nature of the assistance they offer at accident scenes. The study results will expose the “pre-hospital trauma care knowledge and skill gaps” which can inform future training to facilitate safe handling and rescue of RTA victims in line with best practices. The remaining part of this paper proceeds as follows: Section 2 discusses the study methodology, while Sections 3–6 presents the study findings, discussion, study limitation and conclusion and implications for practice.

2. Methodology

We adopted a phenomenological research methodology [15] to explore and provide an in-depth description of participants’ experiences/encounters with pre-hospital care for road traffic accident victims on the Kasoa-Mankessim highway (**Figure 1**) in the central region of Ghana. This highway is a segment of the Accra-Cape Coast road network. The entire road network is classified as a national route 1 (N1) road and also forms part of the Trans-West African Highway network.

The Kasoa-Mankessim section is a single two-lane carriageway (31.1 km in length; 7.3 m wide with 2.5 m shoulders on both sides). The road’s posted speed

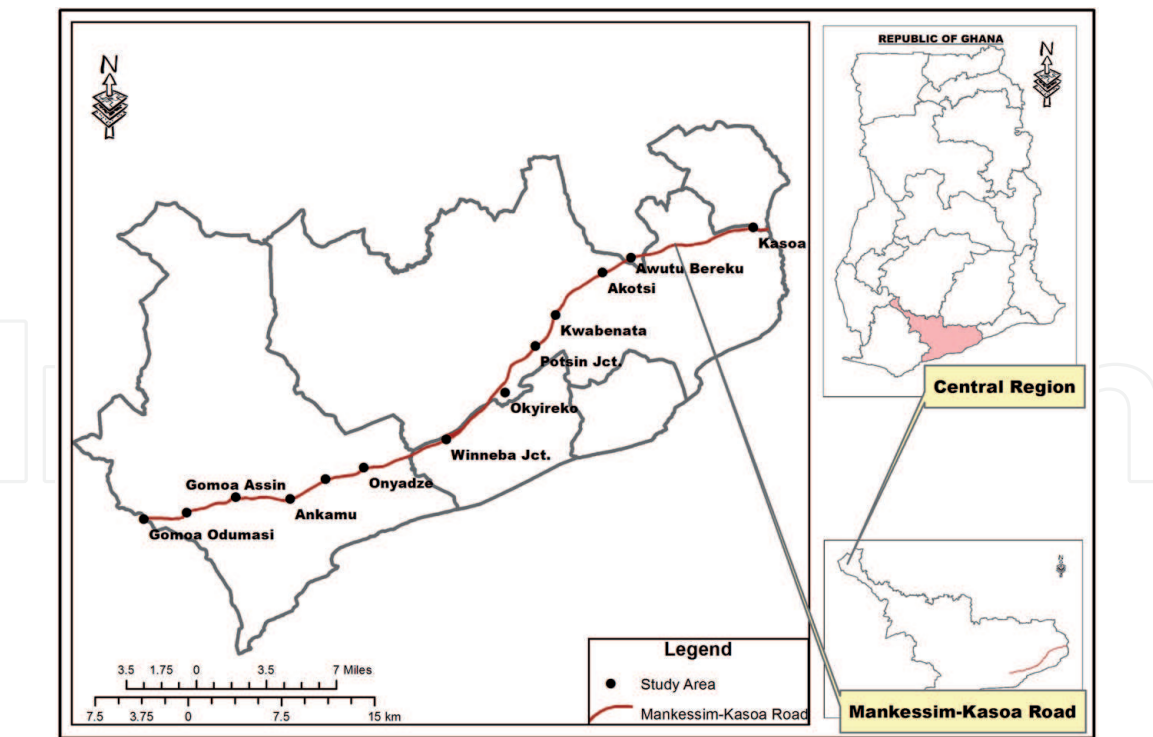


Figure 1.
Map of the study areas and road network.

is between 50 and 100 kph with a weighted average annual daily traffic volume of 9661 vehicles per day. The road links many settlements in the region to Accra, the national capital [16]. There are 11 ‘police-identified blackspots’ on the road network namely Brigade, Galilea, Amanfrom, Potsin Junction, Budumburam, Okyereko Junction, Adawuku, Bible College Area, Tipper Junction, Awutu Beraku and Gomoa Buduatta Junction. These black spots are characterised by dangerous curves, slippery steeps, narrow bridges and undulating surfaces. For the year 2014 alone, 631 RTAs (i.e., 90 fatal, 137 serious, 158 slight and 246 property-damage-only accidents)¹ were recorded on the entire Accra-Cape Coast road network associated with 696 casualties (119 killed, 241 serious and 336 slight injuries). These figures translate into 4.5 accidents per kilometre and 4.9 casualties per kilometre [17].

2.1 Procedure

Prior to data collection (interviews), we carried out a reconnaissance visit to the selected communities. Our aim was to introduce the study to the community stakeholders, familiarise ourselves with the terrain, and pre-select and schedule interview appointments with potential respondents. At the data collection stage, we employed a mix of non-probability sampling techniques (i.e., purposive, convenient and snowball sampling techniques) in selecting the study participants and communities. Our study comprised of 80 purposive samples from 12 conveniently sampled communities/settlements (mostly blackspots) along the Kasoa-Mankessim road network (the communities are indicated in **Figure 1**). To be eligible to participate in the study, a person ought to have first-hand-on-the-spot experience assisting RTA victims on this road segment. At some stages of the data collection, we employed

¹ Fatal accident is here defined as an accident where at least one casualty dies of injuries sustained within 30 days of occurrence; serious injury accidents involve at least one casualty detained in hospital as an in-patient for more than 24 hours; slight injury accident is minor requiring at most first-aid attention for the casualties.

the snowball sampling technique to sample other eligible participants from our initial contacts. On average, we interviewed six persons in each community lasting nearly 15 minutes from March to April 2017.

2.2 Analysis

Data coding and analysis were done in stages. At the first stage, we produced a transcript of each interview in English (participants gave consent to the audio recording of the interviews) and loaded into the Atlas.ti 7.0 software. At the second stage, we conducted inductive data coding and analysis using open and *In Vivo* coding (to 'honour' participant's voice and to ground the analysis from their unique experiences and perspectives) [18]. Lastly, we conducted a thematic analysis of the data, resulting in two main themes namely, knowledge of pre-hospital care for road traffic accident victims and the nature of assistance offered to the accident victims.

3. Findings

Our sample was mainly males (83.7%) over 30 years old (53.8%) and mostly Junior High school graduates (43.7%) **Table 1**. Study sample characteristics ($n = 80$).

From our interviews, we gathered that at least an accident occurs every month on this road as evidenced by the quotes below. Interestingly, 2 days to the interviews, an accident occurred around Okyereko (one of the selected communities) as recounted by this respondent:

A sprinter bus had an accident just in front of our house 2 days ago (Male, 42 years, Okyereko).

Yes, I have witnessed a number of road accidents on this highway. I can count about six of them and the last one I witnessed, 14 people died. This happened 2 weeks ago (Male, 29 years, Apam junction).

On this road, almost every month we hear of road accidents. The last one I witnessed was about 3 weeks ago where everyone on board the vehicle died. I personally have witnessed more than seven accidents on this road and heard of uncountable others (Male, 33 years, Gomoa Mprumem).

The accident-prone nature of this highway is depicted by the number of cautionary billboards planted close to previous accident spots. On each billboard, the number of people killed in a particular accident at a spot is indicated as shown in **Figure 2**.

Below, we present the study findings based on the themes and supported by relevant quotes from the transcript.

3.1 Knowledge of pre-hospital care for RTA victims

As it is customary for residents along the highway to attend to RTA victims in the event of accidents, we sought to explore their knowledge of some basic pre-hospital emergency care for RTA victims. Generally, we assessed respondents' knowledge of care for victims bleeding, recovery position for victims with fracture (broken bones) and basic airway control in unconscious persons.

Generally, we noted that the majority of the participants have no practical training in pre-hospital care for RTA victims. For those who have received some

Variable		N	%
Sex	Male	67	83.7
	Female	13	16.3
Age	18–25 years	17	21.2
	26–30 years	20	25.0
	Above 30 years	43	53.8
Education (attained)	Non-formal	7	8.7
	Junior High	35	43.7
	Senior High	27	33.7
	Tertiary	11	13.7
Total		80	100

Table 1.
 Study sample (n = 80).



Figure 2.
 Billboard indicating previous accidents on some spots on the highway.

training (n = 16 or 20%), they claimed it was just talk-based with a little demon-
 stration. The rest acquired appreciable knowledge through years of rescue care for
 RTA victims.

*Yes. I remember one day, a group of people came here to talk to us about how we
 should handle accident victims. They said whenever we hear of a road accident,
 we should rush to the accident scene to help and try our best to call the Ambulance
 service and the Police. But it was mainly a talk show with little demonstration
 (Male, 32 years, Apam-junction).*

Regarding victim recovery position(s) in the event of suspected fracture (bro-
 ken bone), 20% of the participants (those with some training) rightly revealed
 that victim recovery position(s) depends on the nature of the injury sustained.
 They emphasised placing the victim on the ground as it is difficult to determine the
 nature of the injury sustained.

*Not all victims who are involved in road accidents sustain serious or severe injuries.
 So those victims who are not hurt or injured, some of them could stand and others*

sit on the ground. But the severely injured victims should be placed on the floor with their backs to the ground (Male, 34 years, Apam-junction).

If the victim has a broken leg or hand, let the victim lie with the back to the ground. Usually, the position of the victim depends on the form of injury I suspect might have occurred (Male, 32 years, Apam-junction).

I think the casualty should be made to lie down at the back to get enough air because the casualty may be suffering from a spinal problem or a dislocated waist or leg and so allowing such a victim to sit or squat may result in other injuries (Male, 30 years, Potsin).

Yet, others, like this respondent, revealed:

I usually do not know the affected part of the victims, so my aim is to remove the victims from the car to be transported to the hospital (Male, 35 years, Gomoa Mprumem).

In case the victim is bleeding, most respondents (86%) demonstrated adequate knowledge of pre-hospital care including applying pressure to the affected area by pressing hard with the hands and subsequently applying local herbs or leaves and bandage to the bleeding part in order to stop or reduce bleeding (external compression for haemorrhage control).

I tear the victim's shirt and use it to bandage the affected part. This helps to reduce the bleeding to prevent loss of blood, even if there is a delay in transporting them to the hospital (Male, 34 years, Apam-junction).

I am a driver, so I usually use dusters from my car or the shirts of (male) victims to tie the bleeding part before I transport them to the hospital (Male, 37 years, Apam-junction).

It is evident from the interviews that bandaging or tying the bleeding area (haemorrhage control) is the common first aid most residents know of. However, others revealed different indigenous methods to stop bleeding.

For me, what I normally do is to look for leaves like "Acheampong" (a local herb) and I grind it on the road and apply it on the bleeding part to reduce the bleeding, or even at times I use plantain leaves, grind it and after that, I squeeze the water content on the bleeding part. Even though it hurts when the leaves are applied to injuries, but they help to reduce bleeding as soon as possible (Male, 35 years, Gomoa Mprumem).

Lastly, we also quizzed respondents on their knowledge on how to assist unresponsive RTA victims. About 27% of the respondents rightly suggested checking the victim's pulse and body movements to determine the chances of survival and shouting into the victim's ear to determine if the victim responds or not. Other participants also think because most unresponsive victims become short of breath, the best way to assist them is by placing them on the ground with the head tilted backwards to open the airway in the throat to enable the victim to take in more air (basic airway control in unconscious persons).

If the victim still breaths or the heart still beats, I put the victims in an open space to get more air. But if I cannot feel the heartbeat, I conclude that the victim is dead yet still we transport them to the hospital (Male, 35 years, Gomoa Mprumem).

In sum, we realised that the study respondents were more adequate in their knowledge of pre-hospital care for bleeding accident victim(s) than in the case of the recovery position for the victim(s) who suffer fracture (broken bones) or are unresponsive.

3.2 Nature of assistance offered to accident victims

Varied methods, mainly indigenous, are employed in saving RTA victims. **Figures 3–5** depict the kind of assistance community residents provide at accident scenes. We observed that the “scoop and run” method of pre-hospital care (which involves providing basic care at the trauma site and rushing the victim to a hospital) was the common practice among the respondents. Some respondents also call on the National Fire Service and the Ambulance Service to help. The quotes below illustrate the kind of assistance provided at accident scenes.

We have not been trained on how to administer first aid and also do not have what it takes to treat the accident victims, and so we usually arrange with an oncoming vehicle to transport them to the nearest hospital (Female, 34 years, Kwabenata).

A taxi had an accident here 2 weeks ago and it caught fire. We all had to run to our homes to fetch water to quench the fire before we were able to remove the victims from the car (Male, 28 years, Kwabenata).

However, the situation was different for those who had ever received some first-aid training:

I have received some training in first aid. As a taxi driver, I usually carry a first aid box in my car with the basic supplies. Anytime I witness an accident and the victims bleed, I wash the bleeding part with water and apply methylated spirit to the affected part(s) and subsequently put cotton wool and plaster to stop the bleeding. Shortly after, I transport the victims in my taxi to the hospital (Male, 38 years, Okyereko).

Notwithstanding, we noted that the rescue efforts were often saddled with challenges. The major challenge we noted was the lack of proper tools to cut open vehicles in order to bring out trapped victims. There was also the difficulty of rescuing victims in burning vehicles. Some respondents revealed sustaining burns and deep cuts by the broken glasses of the crashed vehicles in the process of rescuing victims.



Figure 3.
Residents trying to rescue victims stacked in a vehicle.



Figure 4.
RTA victims put at recovery position.



Figure 5.
Some community residents assisting RTA victims.

Our ability to rescue victims from crashed vehicles depend on the extent of damage to the vehicle. We lack the necessary equipment to cut open accident vehicles. Mostly, we use cutlass, axes and any available tool to cut the vehicle in order to get the victims out. We end up injuring ourselves in the process (Male, 35 years, Gomoa Mprumem).

Whenever an accident occurs here and the vehicle catches fire, removing the victims becomes very difficult but because we want to help, we persist and end up sustaining injuries in the process (Male, 29 years, Kwabenata).

4. Discussion

In this study, we sought to explore the experiences of residents of communities along the Kasoa-Mankessim highway in providing pre-hospital care to RTA victims. This knowledge is important to provide the basis for future training to ensure safe victim handling in line with international best practices. Recently, WHO has encouraged layperson first responder programmes as a basic step in the development of a functioning pre-hospital system [13]. Given that communities along accident-prone highways are normally the first people to come into contact with the RTA victims (first responders), the need to train them adequately cannot be overemphasised.

The current study found that there is a natural inclination to help RTA victims among the study respondents, yet only a handful of them have received proper pre-hospital training to facilitate safe victim handling and pre-hospital care in line with best practices. Of the 80 participants, only 20% had received some form of pre-hospital first-aid training, howbeit inadequate. In view of this, most participants had little knowledge in first aid care processes. As a consequence of the lack of training, participants had devised various strategies to assist RTA victims, which is likely to result in further injuries or even the death of victims.

It was also apparent that even though most of the respondents have not been trained in pre-hospital care to RTA victims, through continuous victim rescue efforts, they have gained some valuable experiences. However, respondents with some training exhibited appropriate knowledge of the pre-hospital procedures in the areas of our knowledge assessment consistent with previous findings [7, 12, 13].

Another important finding was that the scoop and run method of pre-hospital care [19] was common among the study participants. This could be explained by their little or no clinical (pre-hospital) know-how and appropriate tools and supplies to cater for RTA victims. This notwithstanding, available evidence suggests that the scoop and run method is effective in increasing the chance of victim survival in the event of serious injuries [19, 20]. Any delay to transport victims for definitive care decrease the chance of victim survival (which is time-critical) [20].

The study results further support the establishment of layperson first responder systems in pre-hospital deficient settings. Generally, the natural inclination to help RTA victims and the success of the programme in other countries, mostly in Africa makes this workable in our study areas [5, 11–13]. These studies demonstrate that trained layperson first responders retain and appropriately use their newly acquired knowledge and skills for societal good [7, 12].

5. Study limitation

It is noteworthy that similar studies were either quantitative in design or at best evaluation of the impact of a pre-hospital care or first-aid training course or a systematic review of the literature. Unlike these studies, our study was mainly qualitative and exploratory in nature and unique in its approach to exploring the knowledge of pre-hospital care for RTA victims. As a qualitative, exploratory study, it suffers from concerns with generalisability of the study findings to the population, a supposed problem associated with qualitative studies in general. However, the study findings are significant in their own right and provide a valuable first view of the processes residents of the named highway goes through to assist RTA victims which is important for further studies and intervention programmes.

6. Conclusion

Based on the study findings, we conclude that there is a general enthusiasm to assist RTA victims among the respondents and the communities, yet there are gaps in their knowledge of, and skills in pre-hospital care for RTA victims. The study findings thus suggest several courses of action in line with best practices.

To take advantage of community members' eagerness to assist RTA victims, the relevant stakeholders and policy-makers (Ghana Red Cross Society, National Ambulance, Ghana National Fire Service, and Ministry of Health) could undertake a couple of policy and practical actions toward ensuring efficient pre-hospital care for RTA victims.

The most obvious and immediate action involves implementing a functioning layperson first responder systems in the communities along the road network. As suggested in a previous study [7], persons (e.g., taxi drivers, community leaders) who are likely to chance upon and transport RTA victims could be the target of this layperson first responder training programmes. These persons should be equipped with the needed skills and first-aid kits/supplies to provide basic life support services pending definitive care as well as transport RTA victims to the nearest health facility. Periodic refresher training and incentives for the laypersons will ensure the sustainability of the system [6, 7]. As indicated earlier, this is an important and cost-effective step to developing formal emergency pre-hospital care systems [12]. Related to this is the urgent need to establish effective communication and transportation channels between the communities, the relevant stakeholders and health facilities.

It is also possible to utilise modern information and communication technology to send out messages to the relevant stakeholders in the event of RTAs. By the use of a global positioning system (GPS)-enabled devices, exact coordinates of accident locations could be sent to the national ambulance and other stakeholders for immediate deployment and assistance. For instance, the request for emergency service feature of the recently launched “*GhanaPost GPS App*” could be a useful system in this regard. This, however, implies that both community members and the relevant stakeholders should be trained to use it.

Last but not least, given that the driving population (motorists) are probably more likely to chance upon accident scenes, first-aid training/course could be made mandatory for motorists when obtaining a driving licence. This will ensure a well-equipped driving population who could promptly assist RTA victims should they chance upon an accident scene in the course of their journeys [20].

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Conflict of interest

The authors declare no conflict of interest.


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