Original Article

# Factors Influencing Company Bus Drivers' Awareness and Attitudes towards Basic Life Support in Kigali

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## Abstract

**Background**

Basic life support (BLS) refers to a package of care that first responders provide to anyone experiencing a life-threatening condition to increase the victim's chance of survival. Globally, 92% of people who had out-of-hospital cardiac arrest died due to limited provision of BLS, therefore, there is a need to assess the awareness and attitude of the general public towards BLS, such as taxi drivers.

**Methods**

A quantitative, analytical study that involved 327 drivers recruited from three different bus stations in Kigali city was undertaken and binary logistic regression was used for statistical analysis.

**Results**

The current study found that 19.5% of company bus drivers were aware of basic life support, and 29% had a positive attitude. However, none of the participants had a basic emergency kit in their buses. Having basic life support training, (AOR=7.853:95%CI: 1.326-10.413) and previous involvement in accidents (AOR=4.321:95% CI 1.163-4.628) were significantly associated with basic life support awareness.

**Conclusion**

Kigali city in collaboration with Rwanda Utilities Regulatory Authority need to devise ways bus drivers can be trained in basic life support. In addition, there is a need for every bus permitted to work in transportation sectors to get a basic life support kit.

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**Keywords:** Basic life support; awareness; attitudes and factors; and company bus drivers

## Introduction

Basic life support (BLS) refers to a package of care that first responders, healthcare providers, and public safety professionals provide to anyone experiencing a life-threatening condition to increase the victim's chance of survival.[1,2] Lifesaving action can be delivered anywhere depending on where a life-threatening event such as road traffic injuries, choking and respiratory failure accidents can occur.

The BLS intervention becomes effective when it is provided promptly after a life-threatening incident happens.[3] There is a need to know and address the awareness and attitude levels of bystanders and know their related influencing factors. Globally, 92% of people who had an out-of-hospital cardiac arrest which is mostly caused by road traffic accidents, choking, sudden respiratory failure, and angina pectoraris died due to limited provision of BLS.[4] In Africa some data suggesting that incidence of out of hospital cardiac arrest is 6.4 per 100,000 persons, yet almost 97.8% died due to limited provision of BLS respectively. [5]

Small-scale studies conducted in Oman reported that 62.0% were aware of basic life support, however, 70.9% had never had basic life support training in their life which reflects the 60% of laypeople surveyed who showed a negative attitude towards BLS provision.[6,7] Being aware of the proper location of cardiac compression may grant good practice that may lead to adequate blood pumping and ensure sufficient vital organ perfusion. However, a study done in Saudi Arabia showed that 70% of participants were not aware of the proper position of chest compression.[8] In Africa, there is a paucity of studies that have investigated BLS among different people including bus drivers.

Rwanda's health sector annual performance record for 2019-2020 indicate that most BLS interventions by Service d'Aide Medicale d'Urgence (SAMU) outside of the hospital were related to a road traffic accident (RTA) accounting for 47% of all interventions.[9] Data from SAMU further showed that trauma is the most life-threatening event that happens in Kigali and this trauma results mostly from road traffic accidents and motorcycle taxi riders are highly affected.[10] When motorcycle taxi riders collide with cars, car drivers are considered as the first bystanders at the scene to intervene by providing BLS. Following the chain of survival, early detection of life-threatening emergencies and immediate initiation of life-saving action can increase the chance of surviving.[11] Lifesaving action has to be started by bystanders while waiting for medical care personnel to reach the scene to provide advanced lifesaving support.[12] Despite the important role of bystanders, their insufficient skills could lead to a decline in the victim's condition, as they may not be able to utilise proper Basic Life Support (BLS) techniques. However, it is important to consider that the practical perspective reveals a potential limitation in the public's awareness regarding prompt and effective intervention. This limitation persists despite the scarcity of studies that delve into this particular aspect.

Moreover, there is a paucity of published research on the knowledge and perceptions of bystanders when it comes to the administration of basic life support (BLS) by non-medical individuals, as well as the various factors that may impact their attitudes. Furthermore, there is lack of published studies that explore the awareness, attitudes, and influencing factors specifically related to BLS among drivers. Furthermore, gathering data on the level of awareness and attitudes of taxi drivers towards the provision of BLS, along with identifying the factors associated with laypeople's ability to administer BLS,can help show areas that require further interventions to enhance the skills of taxi drivers in providing BLS.

Hence, the present study aimed at answering these research questions:

- What is the level of awareness of company bus drivers in Kigali regarding the provision of basic life support to the victims of a road traffic accident?
- What are company bus drivers' attitudes to applying basic life support skills in saving the lives of the victims of a road traffic accident?
- What are the factors that are likely to influence or affect company bus drivers' awareness and attitudes towards basic life support?

## Methods

### Study design

This study was of quantitative design because it was purposed to describe the characteristics of company bus drivers regarding their awareness, attitudes regarding BLS and factors affecting their level or awareness and factors affecting their level of awareness and attitudes

### Study setting

There were seven main bus station in Kigali city, which are Nyabugogo, Remera, Kimironko, Kabuga, Kacyiru, Downtown and Nyanza bus stations. Data were collected in different three bus stations in Kigali city which are Downtown bus station, Nyabugogo bus station, and Nyanza bus station. The three bus stations were chosen randomly using lottery whereby every bus station was written on a piece of paper and folded; and bus stations written on three papers picked were considered as the research setting.

### Study population

Participants were bus drivers who operated in chosen bus stations in Kigali city, meeting the eligibility criteria which were: bus drivers who were at work during data collection period, drivers who had at least three months of driving experience, working in a public transport, operating in a chosen bus station in Kigali, and agreeing to participate voluntarily in this study by signing a consent form.

### Sampling approach

To select the drivers, non-probability convenience sampling method was used. Convenient sampling was chosen because of the nature of the work of these drivers so as to maximize their presence before they could drive away.

### Sample size

To determine the sample size in this study, Yamane formula was used.[13]

$$n = \frac{N}{1 + N(e)^2}$$

Where;

n: sample size
N: Total population
e: P value (0.05)

Based on RURA's report of 2020, there were almost 1800 bus drivers who operated buses in Kigali.[14]

$$n = \frac{1800}{1 + 1800(0.05)^2}$$

n= 327

Sample size for this study was 327 bus drivers who operated in selected bus park station.

### Participant recruitment

We first identified eligible participants through approaching public transport agencies operating in chosen bus station and ask the list of drivers on duty. Thereafter we physically approached each driver individually with a help of their respective supervisors, explained the study objectives adequately to the approached participants, give them a time to ask for any needed clarification and after obtaining informed consent and maintaining ethical standards, the participants who were retained were recruited into this study and given questionnaire to complete.

### Data collection procedure

Questionnaire that used to collect data in this study was adopted and slightly modified to meet the study objective.The questionnaire had 4 different sections (social demographic characteristics, awareness of BLS, attitude towards BLS, and influencing factors).

Before distributing questionnaires for data collection, every participant got information about research purpose and instructions to consider when responding to the questions about the study. The research tool was given to all company bus drivers who met the inclusive criteria and who accepted voluntarily to participate in the study and signed a consent form. Data were collected using self-administered questionnaire in English or Kinyarwanda for those who did not understand English language. Furthermore, full explanation was given for more clarification and more understanding of the questions, and the filled questionnaires were collected back on the same day of distribution.

**Data analysis**

Collected data were analyzed using a computer program, IBM SPSS Statistics for Windows version 21.0 (IBM Corp, Armonk, NY, USA) to obtain descriptive statistics such as frequency of drivers' attitudes; and to find any associations between the independent and dependent variables. Reverse scoring (that is, the numerical scoring scale runs in the opposite direction where the responses was listed from Negative to positive or vice versa) was used to determine the nature of the attitude of the participants. To determine the factors associated with BLS awareness and attitudes, binary logistic regression analysis was used to determine the extent of that association, and then later multinomial logistic regression analysis to find the factors that are more likely to influence drivers' awareness and attitudes towards BLS.

**Ethical considerations**

The institutional review board (IRB) of the University of Rwanda, College of Medicine and Health Sciences granted approval letter CMHS/IRB/576/2022 of December 2022 for the commencement of this research. Additionally, permission letter number 068 R&D/DG/RURA/2023 of January 2023 was obtained from the Rwanda Utilities Regulatory Authorities (RURA) to initiate data collection.

The research objectives were clearly communicated to the target population, and individuals who expressed interest and willingly agreed to participate in the study were provided with consent forms. Upon signing the consent forms, participants were given a specifically designed questionnaire. It is important to note that participation in the study was entirely voluntary, and participants had the freedom to withdraw at any point if they felt uncomfortable. To ensure the confidentiality of all provided information, the questionnaire did not include any personal identifiers such as names, phone numbers, or identity card numbers.

## Results

A total of 327 drivers were included in this study and were selected randomly based on their availability at their work place. Most of the participants (48%, n=157) were between 36 to 50 years of age. The predominant participants (99.4%, n=325) were men. Other demographic information is illustrated in Table 1.

**Table 1. Social demographic characteristics of participants n=327**

| Variables | | Frequency | % |
|---|---|---|---|
| Age Group | 18-35 | 71 | 21.7 |
| | 36-50 | 157 | 48.0 |
| | 51 and above | 99 | 30.3 |
| Gender | Male | 325 | 99.4 |
| | Female | 2 | 0.6 |
| Marital status | Single | 260 | 79.5 |
| | Married | 44 | 13.5 |
| | Divorced | 23 | 7.0 |
| | Widow | 0 | 0 |
| Education level | No formal schooling | 7 | 2.1 |
| | Primary school | 37 | 11.3 |
| | Secondary School | 253 | 77.4 |
| | University study | 30 | 9.2 |
| Experience in driving | Less than 1 year | 0 | 0 |
| | 1 to 5 years | 32 | 9.8 |
| | 6 to 10 years | 113 | 34.6 |
| | 11 years and above | 182 | 55.7 |
| Experience in driving bus | Less than 1 year | 0 | 0 |
| | 1 to 5 years | 137 | 41.9 |
| | 6 to 10 years | 40 | 15.3 |
| | 11 years and above | 140 | 42.8 |
| Involved in RTA | Yes | 103 | 31.5 |
| | No | 224 | 68.5 |
| Trained about BLS | Yes | 65 | 19.9 |
| | No | 262 | 80.1 |
| Having first aid kit in bus | Yes | 0 | 0 |
| | No | 327 | 100 |

Key: RTA, road traffic accident; BLS, basic life support

**Awareness of drivers who participated in this study towards BLS**

Regarding awareness of bus drivers towards BLS, 74.9% (n=245) of participants heard about BLS, and 81.0% (n=265) of all participants think that BLS is based on Early recognition of sudden life-threatening conditions and immediate activation of the emergency response system. However, 93.6% (n=306) of all participants believe that BLS has to be provided to the victim only when the victim reaches the hospital.

To determine level of awareness of the company bus drivers who participated in this study, we considered the 15 questions asked in this section, of which 10 only were graded. Each question was graded out of 2 marks, whereby those who responded most correctly scored 2 marks and those who gave an alternative applicable response received 1 mark. The total score was 20 marks which was then converted back to out of 10. Referring to.[15] Those who had total marks between 7 and 10 were considered to be have adequate awareness regarding BLS provision, between 5 and 6, to have fair awareness, and those below 5 out of 10 as having poor awareness for BLS provision.

Table 2. Shows more about participants' awareness. The majority of participants who participated in this study (41.28%, n=135) had a fair level of awareness, 39.14% (n=128) had a poor level of awareness regarding BLS provision, and only 19.57% (n=64) of participants who participated in this study are the only one who has adequate awareness regarding BLS provision

**Table 2. Awareness of taxi driver for basic life support (N=327)**

| Variables | | Frequency | Percentage % |
|---|---|---|---|
| Have you ever heard about basic life support? | Yes | 245 | 74.9 |
| | No | 82 | 25.1 |
| What do you think is involved in providing BLS | Giving medication | 14 | 4.3 |
| | Airway opening | 7 | 2.1 |
| | Stopping bleeding | 41 | 12.5 |
| | Early recognition of sudden life-threatening condition followed by activation of the emergency response system | 265 | 81.0 |
| Where does basic life support have to be provided | Immediately at the scene of the incident | 11 | 3.4 |
| | Upon reaching the hospital | 306 | 93.6 |
| | After reaching home | 7 | 2.1 |
| | I don't know | 3 | 0.9 |
| In the case of RTA, whom do you call first to intervene at the scene? | Police | 123 | 37.6 |
| | Known medical personnel | 37 | 11.3 |
| | Ambulance | 167 | 51.1 |
| If you notice RTA, what can you do first? | Call police | 136 | 41.6 |
| | Call the ambulance helpline | 107 | 32.7 |
| | Initiate BLS | 84 | 25.7 |
| When should BLS be initiated in case of RTA? | Immediately after the accident | 21 | 6.4 |
| | When the police arrive at the scene | 5 | 1.5 |
| | When healthcare personnel arrive at the scene | 296 | 90.5 |
| | As soon as the victim reaches the hospital | 5 | 1.5 |
| Who should initiate BLS in case of RTA | Attending Police officer | 76 | 23.2 |
| | Drivers who witness RTA | 23 | 7.0 |
| | Family members | 10 | 3.1 |
| | Healthcare personnel on arrival | 218 | 66.7 |
| What can be prioritized when offering Basic Life Support to a victim of RTA? | ABC check and maintenance | 100 | 31.6 |
| | Take the victim to the hospital | 222 | 67.9 |
| | Leave him/her alone | 5 | 1.5 |
| What case do you think bystanders can give BLS in case of RTA without Healthcare personnel | Victim with active bleeding | 101 | 30.9 |
| | Victims with airway compromise | 5 | 1.5 |
| | Every victim can receive BLS from a bystander, but intervention may be different depending on the victim's condition | 26 | 8.0 |
| | None | 195 | 59.6 |

**Key:** RTA, road traffic accidents; BLS, basic life support; ABC, airway, breathing and circulation

**Attitude of drivers in Kigali towards BLS**

The majority of the participants (97.6%, n=319) agreed that providing BLS to someone who is facing life threatening condition is important to save his/her lives. Most of the respondents, 60.85% (n=199) had a negative attitude towards BLS provision, and only 29.05% (n=95) of the bus drivers had a positive attitude towards BLS provision, while 10.09% (n=33) were undecided. Other aspects of attitude of bus drivers in this study are shown in Table 3.

**Table 3. Attitude of bus driver towards BLS provision**

| Attitudes | Agree | Neutral | Disagree |
|---|---|---|---|
| It is important to provide BLS for a victim after RTA | 319 (97.6%) | 5 (1.5%) | 3 (0.9%) |
| I am not willing to provide BLS to accident victims because I can apply the wrong treatment and cause harm to the victim. | 214 (65.4%) | 58 (17.7%) | 55 (16.8%) |
| I am not will willing to provide BLS to accident victims because I fear acquiring infections from the victim. | 41 (12.5%) | 218 (66.7%) | 68 (20.8%) |
| I am not willing to provide BLS because I don't know how to provide BLS. | 241 (73.7%) | 42 (12.8%) | 44 (13.5%) |
| I am not willing to provide BLS because I fear that I can be held accountable legally if things go wrong. | 218 (66.7%) | 42 (12.8%) | 67 (20.5%) |
| Any bystander can provide BLS anytime s/he witnesses RTA even when he may not be having BLS training. | 38 (11.6%) | 64 (19.6%) | 225 (68.8%) |
| Any bystander can provide BLS to RTA victims alone without necessarily waiting for healthcare personnel's intervention. | 14 (4.3%) | 57 (17.4%) | 256 (78.3%) |
| BLS should be provided by attending police officers only. | 24 (7.3%) | 69 (21.1%) | 234 (71.6%) |

Key: RTA, road traffic accident; BLS, basic life support

**Factors influencing awareness and attitude of bus driver in Kigali towards bls provision**

**Table 4. Factors that influence awareness level of bus drivers towards basic life support**

| Factors | | Awareness level for BLS | | COR (95%CI) | AOR (95%CI) | |
|---|---|---|---|---|---|---|
| | | Adequate Awareness | Inadequate Awareness | | | P value |
| Age | 18-35 | 20(33.9%) | 39(66.1%) | 1 | | |
| | 36 – 50 | 65(52.0%) | 60(48.0%) | 2.112(1.110-4.019) | 1.117(0.334-3.739) | 0.213 |
| | 50 and above | 72(66.1%) | 37(33.9%) | 3.795(1.943-7.409 | 2.022(1.41-3.49) | 0.08 |
| Driving Experience | 1-5 | 46(43.0%) | 61(57.0%) | 1 | | |
| | 6-10 | 50(49.5%) | 51(50.5%) | 1.300(.753-2.245) | 0.463(0.177-1.212) | 0.068 |
| | 11 and above | 75(64.7%) | 41(35.3%) | 2.425(1.414-4.162) | 2.45(1.26-4.473) | **0.008** |
| Marital status | Single | 17(30.4%) | 39(69.6%) | 1 | | |
| | Married | 154(57.5%) | 114(42.5%) | 3.099(1.669-5.755) | 2.093(.626-6.993) | 0.441 |
| Trained regarding BLS | Yes | 117(75.5%) | 38(24.5%) | 6.557(4.024-10.685) | 7.853(1.326-10.413) | **0.002** |
| | No | 54(32.0%) | 115(68.0%) | 1 | | |
| Bus driving experience | 1-5 | 46(57.5%) | 34(42.5%) | 5.412(.579-50.616) | 0.836(0.156-4.473) | **0.05** |
| | 6-10 | 30(48.4%) | 32(51.6%) | 3.750(.396-35.480) | 0.442(0.087-2.241) | 0.156 |
| | 11 and above | 1(20.0%) | 4(80.0%) | 1 | | |
| Education level | No formal school | 57(68.7%) | 26(31.3%) | 2.790(1.117-6.972) | 1.907(.617-5.900) | 0.338 |
| | Primary school | 50(57.5%) | 37(42.5%) | 1.720(.701-4.217) | 1.042(0.352-3.086 | 0.0635 |
| | Secondary school | 11(44.0%) | 14(56.0%) | 1 | | |
| Involved in RTA before | Yes | 90(6 8.2%) | 42(31.8%) | 2.431(1.442-4.100) | 4.321(1.163-4.628) | **0.001** |
| | No | 52(46.8%) | 59(53.2%) | 1 | | |

**Key:** RTA, road traffic accident; BLS, basic life support

In binary logistic regression with P-value set at 0.05, it was shown that age, driving experience, basic life support training and previously exposure to road traffic accident were associated with basic life support awareness level of the bus drivers who participated in this study. Those who had 11 years and above driving experience were almost three times as aware as those who had driven less than 10 years (AoR=2.45, 95% CI: 1.26, 4.73). Further factors are shown in Table 4.

In the factors that influence bus drivers' attitude towards BLS, binary logistic regression shows that level of awareness, BLS training and previously involvement in RTA were associated with BLS attitude (AOR=5.29, 95% CI: 1.431, 19.589). In multivariable regression analysis, the participants who had adequate awareness regarding BLS were four times more positive attitude more that participated driver who had inadequate awareness level (AOR=4.051, 95% CI: 1.117,14.687). Bus drivers who had been trained about BLS were six times as likely to have a positive attitude as those who had not been trained (AOR=6.008, 95% CI: 2.807, 11.757).

## Discussion

This study aimed to find out the level of awareness and the attitude of company bus drivers operating in Kigali regarding basic life support interventions, along with influencing factors. 99.4% of participant in this study were men, only 19.9% were trained about basic life support provision while 61% had negative attitude towards basic life support provision.

Most of the participants in this study were men (99.4%). Which is almost similarly to the findings of the study done in Nigeria and Ethiopia where all participants in those study were men respectively.[16,17] This may be due to that mostly women are not involved in transport sector as drivers due to society taboos that public transportation or big cars driving is only for men.[18] In this study most participants were aged between 36 to 50 years old (48.0%). Even though sample size and research settings were different, this rate of driving experience is similar to the finding of the study done in India.[19]

This study showed that only 19.9% of the drivers had been trained about BLS provision out of whom only 7.6% had been trained on the job. Conversely, those who were trained about BLS in Ethiopia comprised 51.2%, of whom 81.2% were trained on the job.[16,17] Compared to 98.7% lay people trained about BLS in Slovenia, the result of this study is even much lower.[20] This may be due to that in Slovenia BLS training is mandatory to all taxi drivers before being awarded a driving permit, and in Ethiopia it's mandatory for all drivers to attend BLS training at least once in two years, the rate of training are still low due to that this protocol were still in introduction.[21] However, in Rwanda, BLS training is not mandatory, neither in driving school nor in the respective work place.

This study showed that the majority (61%) of the participants had negative attitude towards BLS provision while only 29% had positive attitude, which is much lower than what the study done in Ghana found of 82.9% having a positive attitude towards BLS provision.[22] Likewise, in the study done in Addis Ababa, Ethiopia, 80.6% of the drivers had positive attitude,[17] and in Kampala, Uganda, 60% had a positive attitude.[23] This may be due to large difference in BLS training provision policy among bus drivers in those countries whereby in Ghana, and Ethiopia, BLS training is mandatory to bus drivers, which had a good impact to their level of attitude towards BLS provision.[22]

Concerning attitude towards BLS, this study showed a significant association with level of awareness, BLS training and previous involvement in RTA. Many of those who had adequate BLS awareness tended to have positive attitude than those with inadequate level of awareness. This corroborated the findings of the studies done in Uganda and Zambia which showed that adequate awareness influenced positively attitude towards BLS.[23,24]

However, the finding of a study done in Poland showed that BLS training and using BLS kit had more influence on drivers attitude.[25]

This study shows that BLS training is key factor that influences positive BLS driver's attitude whereby, those who were trained on BLS were six times more likely than those who were not trained to have positive attitude. These findings are slightly similarly to the study done in Ethiopia where those who were trained were five times more than those who were not trained regarding BLS provision.[17] The study done in Egypt showed a statistically significant association between BLS training and driver's attitude towards BLS provision.[26] This can be a key supporting factor that training bystanders including bus drivers is useful for provision of BLS to the victims who have life threatening emergencies including road traffic accidents particularly before professional medical personnel reach the scene or when emergency medical services are not adequately developed.

**Strength and limitations of the study**

Generally, the study was conducted in the different bus stations including those with high numbers of bus drivers, which helped to meet the needed sample size. The study tried to assess the awareness and attitude of the bus driver and the factors that influenced it. Which may be a key to set strategies that aims to reduce the sudden death caused by road-related incidents such as RTA.

Despite the mentioned strengths, this study also had some limitations that might have introduced some bias to the study. First, the study was conducted only in Kigali, hence caution has to be taken when attempting to generalize the results.However, considering that Kigali commands the largest share of buses and drivers in Rwanda, the results can give a broad picture BLS among drivers. Second, the number of women participating in the study was very few. Although this may be taken as a limitation, it is attributed to the fact that female drivers in Rwanda are still very few due to the gendered implications of this profession. A limited budget to conduct this study was a barrier to completing this study as it required more budget, for travelling and other expenses.

## Conclusion

This study found that 61.86% of the drivers were aware about BLS provision including 19.57% who had adequate awareness about BLS provision. Only 19.9% had been trained, and 29% of participants had positive attitude towards BLS provision. Age, driving experiences, basic life support training and accident exposure were significantly associated with basic life support awareness of bus drivers who participated in this study. However, basic life support training was shown to be a factor that most influences basic life support awareness among bus drivers in Kigali. This study shows that basic life support training is the key factor that mostly influences drivers' attitude. None among all taxi drivers' who participated in this study had basic life support kit in the buses they drove.

Based on the findings of this study, there should be a regular plan to train drivers about basic life support provision, basic life support module has to be included in driving school and each and every bus has to have basic life support kit to be used in case of emergency.

**Author's Contribution**

Study Design/Conception: TJD and Dr. UTC

Data Collection: TJD

Analysis and Interpretation: TJD and Dr. UTC

Manuscript writing: TJD and Dr. UTC

**Conflict of Interest**

There are no financial, personal, or professional conflicts of interest that could influence or bias the outcomes, interpretations, or conclusions presented in the manuscript.

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