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## Assessment of seat belt use in University of Cape Coast campus, Ghana

Comfort Ogunleye-Adetona<sup>a</sup>, Thomas Ojo<sup>a</sup>  and Francis Afukaar<sup>b</sup>

<sup>a</sup>Faculty of Social Sciences, Department of Geography and Regional Planning, College of Humanities and Legal Studies, University of Cape Coast, Cape Coast, Ghana; <sup>b</sup>Building and Road Research Institute, Council for Scientific and Industrial Research, Kumasi, Ghana

### ABSTRACT

The paper assesses seat belt use by vehicle occupants such as drivers, front-right passengers and two rear seat passengers in University of Cape Coast campus (UCC), Ghana. An unobstructive observational study of the seat belt wearing status, gender and age-group of motor vehicle drivers, front-right and rear seat passengers disaggregated by vehicle type and usage was carried out from 7 to 9 am and 3 to 5 pm on weekdays at the three entrances into UCC. The results revealed that 3451 drivers, 1728 front-right seated passengers, 1264 first-rear and 1176 s-rear seated passengers were successfully observed. Seat belt use by drivers, front right passengers and rear-seat passengers is 22.2, 2.4 and 1% respectively. Female drivers and female front-right passengers are more likely to wear their seat belts compared to their male counterparts ( $p < 0.001$ ). There is an association between restrained drivers and restrained front-right seat passengers ( $p < 0.001$ ). There is the need for concerted efforts to educate and create awareness on the safety benefits of seat belt usage and enforce the use of seat belt by the National Road Safety Commission and University Transport Committee authority so as to increase the compliance level.

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### KEYWORDS

Seat belt use; drivers' compliance level; passengers; observational study; UCC

## 1. Introduction

The use of buses, minibuses and trucks as means of passenger transport partly accounts for the undesirably high levels of Road Traffic Crashes (RTCs) in most Low- and Middle-Income Countries (LMICs). These vehicles are old and mostly second-hand vehicles dubbed 'Eurocacas' (Chen, 2010; Linder, 2006; Yeboah, 2000). The vehicles may not meet certain safety standards and a report by the National Road Commission (NRSC) in Ghana revealed that a significant majority of the commercial vehicles in the country are old (National Road Safety Commission [NRSC], 2016). Most of these old motor vehicles do not have seat belts provided for drivers and passengers (Peden et al., 2004).

**CONTACT** Thomas Ojo  [thomas.ojo@ucc.edu.gh](mailto:thomas.ojo@ucc.edu.gh), [ojothomas@gmail.com](mailto:ojothomas@gmail.com)

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The seat belt is known to be one of the most effective safety features in a vehicle that reduces the number and severity of injuries and deaths to vehicle occupants during RTCs (Afukaar, Damsere-Derry, & Ackaah, 2010; Briggs, Lambert, Goldzweig, Levine, & Warren, 2008; Forjough, 2003; Peden et al., 2004; Simons & Edunyah, 2014). Seat belts are specifically more effective in reducing risk and severity to the upper parts of the body (Bendak, 2005; Briggs et al., 2008). A correctly used seat belt reduces the chance of injuries and death by more than half in both high and low-speed RTCs (World Health Organization [WHO], 2015; Han, Newmyer, & Qu, 2015). The use of seatbelts prevents the vehicle occupants from hitting the interior parts of the vehicle or being ejected from the vehicle.

In recognition of the importance of seat belt use, the Government of Ghana (GoG) enacted the Road Traffic Act 683 in 2004 to make it mandatory for all vehicle occupants to wear seat belt. Despite the Act, and the relentless efforts of the NRSC in creating awareness on the safety importance of seat belt use, the compliance level by vehicle occupants is extremely low in Ghana (Afukaar et al., 2010; Simons & Edunyah, 2014). It is expected, however, that seat belt wearing would be higher in an academic environment like the University of Cape Coast (UCC) because of the higher educational level and socio-economic standing of most vehicle occupants (Clayton & Helms, 2009; Pastò & Baker, 2001). With this background, the paper seeks to assess the rate of seat belt use by drivers and passengers on the UCC campus.

As noted in Sangowawa et al. (2005, 2010) and Sam (2015), socio-demographic characteristics of vehicle occupants such as gender, age group, vehicle type and usage influence seat belts use. In addition, passengers riding with restrained drivers are more likely to be restrained compared with those riding with unrestrained drivers in towns and cities.

The implications of this paper will help address seat belt use campaign and interventions using the integrated approach by the National Road Safety Commission (NRSC), Driver and Vehicle Licensing Authority (DVLA), Motor Transport and Traffic Department (MTTD) of the Ghana Police Service and the University Transport Committee.

The paper is divided into six sections: the following is the literature review with the third section on methods. The fourth section contains the results, followed by the discussions in section five. Section six comprises conclusion and recommendations.

## 2. Literature review

### 2.1. Concept of seat belt

Seat belts are a secondary safety device primarily designed to prevent or minimize injury to vehicle occupants when a RTC occurs (FIA Foundation, 2004, 2009). The primary objectives of seat belts are:

- Preventing ejection from the vehicle in an impact;
- Reducing the risk of contact with the interior of the vehicle or reduce the severity of injuries if this occurs;
- Preventing injury to other occupants (for example in a frontal crash, unbelted rear-seated passengers can be catapulted forward and hit other occupants); and
- Providing a distributed force of a crash over the strongest parts of the wearer, to give the necessary support in an accident, restraining the vehicle occupants before guiding them back into their seat.

There are four recommended types of seat belts—three-point lap and diagonal seat belt, two-point lap seat belt, single diagonal belt and full harness (FIA Foundation 2004, 2009). Three-point lap and diagonal seat belt is commonly used in cars, vans, minibuses and trucks and in the driver's seat of buses and coaches. The two-point lap seat belt also known as 'single lap belt' is most used in buses and coaches and is inferior to three-point lap and diagonal seat belt. The single diagonal belt provides a better restraint for the upper body of the wearer than the two-point lap belt but is noted to be poorer at preventing ejection (FIA Foundation, 2004, 2009). The full harness is made of a double shoulder, lap and thigh straps with central buckle devices. Thus, the full harness gives very good protection both from ejection and from interior contact.

## **2.2. Importance of seat belt**

Seat belt use is an effective way to reduce the severity of injuries sustained by vehicle occupants in the event of Road Traffic Crashes (RTCs) (Han et al., 2015; Lipovac, Tesic, Maric, & Deric, 2015). Its use while driving reduces the severity of drivers' injuries by 67% (Salzberg, Yamada, Saibel, & Moffat, 2002). The number of fatalities in RTCs is reduced by 40% by front seat passengers while the effect of seat belt use by rear seat passengers has not been studied sufficiently (Elvik, Vaa, Erke, & Sorensen, 2004; Lipovac et al., 2015). The injuries sustained by the vehicle occupants range from traumatic brain injury, head, face and neck injury and thoracic or coccyx injury (Han et al., 2015).

The use of seat belt has social and economic importance attributed to the reduction in the severity of injuries. The victims, the victims' family and the community at large bear the cost of these preventable injuries in the event of RTCs. The medical facilities provided will be stretched. For instance, the United States saved US\$588 billion in casualty costs due to seat belt use from 1975 to 2000 (Blincoe et al., 2002). This invariably means that the use of seat belt can help LMICs make savings to aid in meeting their developmental challenges.

## **2.3. Legislation on seat belt use**

Globally, 156 countries have national or subnational laws enforcing seat belts (WHO, 2009). Many of these countries (e.g. Angola, Bolivia, Egypt) have seat belt laws that do not apply to all vehicle occupants (i.e. to front and rear-seat occupants). According to the WHO (2009) reports, only 38% of low-income (e.g. Afghanistan, Comoros, Nigeria), 54% of middle-income (e.g. Argentina, China, Ghana) and 76% of high-income countries (e.g. Canada, France, US) have mandatory seat belts laws for all vehicle occupants (WHO, 2009, 2015).

## **2.4. Gender and seat belt use**

In general, female vehicle occupants are more likely to be observed wearing safety belts than male counterparts because they are risk averse (Afukaar et al., 2010). Risk perception influences seat belt use, and vehicle occupants with higher risk perceptions are more likely to use seat belts (Cunill, Gras, Planes, Oliveras, & Sullman, 2004).

### **2.5. Age and seat belt use**

Young and older vehicle occupants use seat belt the least (Afukaar et al., 2010; Yannis et al., 2011). The reasons are forgetfulness, laziness, perceived low risk of injury, and discomfort (Begg & Langley, 2000). Besides, young drivers always exhibit this risky driving behavior in addition to speeding and running red lights (Afukaar et al., 2010). This is because, they are deficient in decision-making and are also adventurous (Begg & Langley, 2000).

### **2.6. Vehicle type and seat belt use**

Vehicle occupants in vehicle of higher value are more likely to use seat belt. In Afukaar et al. (2010) vehicle occupants in private cars and SUV were observed to use seat belts more and they suggested that these occupants may be educated and as such see the use of seat belt as a status symbol (Iribhogbe & Osime, 2008). Most private cars are relatively new and hence they are fitted with well functioning seat belts, coupled with enhanced seat belt alarm system. Seat belt enhanced alarm system greatly increases seat belt use of both drivers and passengers (Freedman, Lerner, Zador, Singer, & Levis, 2009; Lie, Krafft, Kullgren, & Tinvall, 2008). Additionally, some of these private cars are fitted with intelligent seat belts, which automatically strap in any person who gets on board.

Meanwhile, the associated challenges of the work of taxi drivers require them to make frequent stops, pick and drop passengers making the use of seat belts difficult. Passengers on the other hand are on a short distance trip and therefore may not see the need to use seat belt (Popoola, Oluwadiya, Kortor, Denen-Akaa, & Onyemaechi, 2013).

### **2.7. Vehicle use and seat belt use**

Vehicle use really influences the use of seat belts. Simons and Edunyah (2014) revealed that the high incidence of seat belt in their study was as a result of the high number of the observed being company drivers. Besides, these company drivers have been educated on the usefulness of seat belts and are mandated to wear seat belt before entering the companies' premises. The use of private cars attracts some social respect and as such vehicle occupants especially drivers see the use of seat belts as a social status (Afukaar et al., 2010). Commercial drivers use seat belt the least because of the nature of their work involving frequent stops to hail and alight passengers and assist passengers in off-loading or loading their luggage (Afukaar et al., 2010; Popoola et al., 2013).

### **2.8. Seating position and seat belt use**

Of all vehicle occupants, drivers use seat belts the most followed by the front-right passengers with rear passengers wearing seat belts the least (Afukaar et al., 2010; Sangowawa et al., 2005, 2010; Yannis et al., 2011). The differences in seat belt use in relation to different seating positions were primarily governed by risk perceptions. Front right seat passengers feel exposed, vulnerable and insecure because of the perception that in the event of a RTCs they are likely to be affected if unbelted. That is, they may sustain varying degrees of injuries or death through ejection. These high risk perceptions motivate front seat passengers to use belt. On the other hand, rear seat passengers feel safe and secure because of the perception

that they are not likely to be involved in frontal RTCs (head-on collisions) by virtue of their separation from the point of collision (Broughton, 2003).

### **2.9. Relationship between driver's use of seat belt and front-right passengers' use of seat belt**

Drivers that use seats are more likely to have front-right passengers who use seat belts (Afukaar et al., 2010). This reveals that the driver has an influence on the seat belt wearing rates of the passengers on board his or her vehicle.

### **2.10. Geographical setting and seat belt use**

Few Studies on seat belt use have been conducted on academic campuses (Clayton & Helms, 2009; Rudd & Geller, 1985; Clark, 1993; Sangowawa et al., 2005) which are on their own small towns or cities. On the other hand, literature abounds on conventional towns and cities (Afukaar et al., 2010; Han et al., 2015; Popoola et al., 2013; Simons & Edunyah, 2014). The rate of seat belt use in the academic institutions is expected to be higher than that of conventional towns and cities because of higher socio-economic characteristics (such as educational status and income level) (Briggs et al., 2008; Clayton & Helms, 2009; Han et al., 2015; Pastò & Baker, 2001; Popoola et al., 2013). Rate of seat belts use also differs on national, urban and rural/feeder road network (Popoola et al., 2013; Yannis et al., 2011).

## **3. Methods**

### **3.1. Study design**

The study was exploratory as it was a naturalistic unobstructive observational design. The unobstructive observational study was conducted at the three entrances/exits of UCC-West Gate (main gate), East gate and Farm gate. All vehicles entering or exiting the campus were potential participants. The security personnel at the various gates made vehicles to stop for checks or slow down considerably, allowing sufficient time for detailed information to be recorded on drivers, front-right and two rear-seat passengers for randomly sampled vehicles.

A pilot test was carried out at traffic lights intersections where vehicles come to a stop on the red lights within the campus, in order to fine-tune the observational checklists. Twelve research assistants were trained for one day prior to the start of the surveys. To ensure inter-reliability, two research assistants focused on vehicles on one lane with the other two observing the other lane (Clayton & Helms, 2009). Eventually, the two research assistants compared notes to reconcile the number of vehicles, type of vehicles, vehicle usage, gender of drivers and passengers.

This design provides more credible information compared to self-reported surveys and police reported seat belt use on crash reports (Afukaar et al., 2010; Kostyniuk & Vivoda, 2001). The latter two approaches are likely to over-estimate actual seat belt use. Besides, police reported data on seat belt use is rarely available in Ghana (NRSC, 2016).

### **3.2. Study area**

The study was conducted on UCC campus. UCC is located in Cape Coast Metropolis along the coastal highway, designated N1, in the Central Region of Ghana. Central

Region is known to be one of the three regions with the highest rate of fatal RTCs in Ghana (NRSC, 2016). The study was conducted in November when the academic work was at its peak.

### **3.3. Sampling procedure**

Lack of secondary data is an immense challenge confronting studies like this in Ghana (Afukaar et al., 2010; Sam, 2015; Simons & Edunyah, 2014). Hence, no sample frame was used in this study. Therefore, all vehicles entering and leaving the university campus during the period of observation were eligible. Invariably a census of all eligible vehicles was conducted. Eligible vehicles in the survey were taxis, minibuses, trucks, large buses, sports utility vehicles (SUVs) and private sedan cars. For all eligible vehicles, seat belt use by drivers and front right and two rear seat passengers and their demographic information (gender and age-group) were recorded. Again, observations were only carried out on the designated lane of traffic while vehicles were entering or leaving the university campus. Safety belt use was determined by examining whether or not the drivers or passengers were wearing their seat belts. The two rear-seat passengers, the one behind the driver and the other one closest to the door/window were observed if any. It was difficult to observe clearly rear-seat passengers in large buses and heavy trucks. However, the ones observed was recorded. No information was gathered to identify the personal details of the drivers or passengers and vehicle registration numbers.

The drivers' and passengers age groups were product of guesswork. The driver's age-group was grouped into <26 (young adult), 26–50 (intermediate adult) and >50 (older adult) years in consonance with the statutory age of acquiring a license C category (i.e. for commercial or corporate drivers in Ghana) (Afukaar et al., 2010). The passengers age groups were <18 (young), 18–50 (intermediate) and >50 (adult) years in accordance with the Road Traffic Act and Road Traffic Regulation (Li 2180) that enjoin all vehicle occupants to use the seatbelt with the exception of <18 years old passengers who are to be supervised by the driver or an adult passenger as the case may be. Ages of all vehicle occupants were estimated by the research assistants and placed in the designated groups (Afukaar et al., 2010; Pastò & Baker, 2001).

### **3.4. Data collection and analysis**

An observational checklist was used in observing the vehicle and occupants' characteristics: gender of drivers and passengers; drivers' and passengers' age; type and use of the vehicle; and drivers' and passengers' use of seat belts. All data collection was done during the day time and in fine weather condition. As an institution of higher learning, the crucial traffic periods for the university are during the rush hours, mostly from 7 to 9 am and 3 to 5 pm. The data collection was carried out within these periods for five working days.

A database was created for the results of the observational survey in Microsoft Excel spreadsheet. The database was then imported into SPSS for cleaning. The data cleaning is very important as it helps to identify inconsistencies and outliers. Then, SPSS v 21 was used in running the analysis, which culminated, in the use of frequencies, percentages, and cross tabulations. The testing of the hypotheses was carried out using Pearson Chi-square.

## 4. Results

This section presents the general overview of the results, the relationship between drivers' and passengers' seat belt use against gender, seat belt use by of age of vehicle occupant, seat belt use as a function of vehicle type and usage, relationship between restrained driver and restrained first-right passenger.

### 4.1. General overview

A total of 3451 vehicles comprising 1235 (35.8%) private sedan cars, 1504 (43.6%) taxis, 354 (10.3%) minibuses, 248 (7.2%) sports utility vehicles (SUVs), 85 (2.5%) large buses and 25 (0.7%) heavy trucks were completely observed. In all, 3451 drivers, 1728 front-right passengers, 1264 first rear-seat and 1176 s rear-seat passengers were also observed. No female was observed as a second rear-seat passenger and males were the most dominant vehicle occupants observed; as drivers (87%), as front-right passengers (76.6%) and first rear-seat passengers (92.4%). Overall, 11.7% of all the vehicle occupants wore seat belt; comprising 22.2% seat belt use by drivers, 2.4% by front-right passengers and only 1.0% by first rear-seat passengers. None (0%) of the second rear-seat passengers was belted. The highest rate of seat belt use (88.9%) was among large bus drivers with the least compliance rate being among taxi drivers (10%). For the front-right and first rear-seat passengers, seat belt use was most likely to be in SUVs (42.1%; 1.8%), followed by passengers in Private cars (13.6%; 1.3%). Apart from the occupants of private sedan cars and SUVs, none of the rear-seat passengers in the other vehicles wore seat belt.

### 4.2. Drivers versus passengers' seat belt use and gender

The rate of seat belt among drivers, front-right seat, first rear-seat and second rear-seat passengers was 22.2, 6.3, 0.2, 0% respectively as shown in Table 1. The Table further shows that females have higher seat belt wearing rates of 51.9, 19.1 and 1.0% as drivers, front right passengers and first rear-seat passengers respectively compared to 17.9, 2.4 and 0.2% by their respective male counterparts. Statistical analysis, further shows that there is a relationship between the gender of the vehicle occupants and the use of seat belt at  $p < 0.001$ .

### 4.3. Seat belt use by of age of vehicle occupant

As shown in Table 1, 63.3% of the drivers below 26 years old and 46.3% of older drivers >50 years old used the seat belt. In contrast, the highest seat belt use for the front-right passengers was among 18–50 years old registering 6.5% compliance level with those below 18 years registering only 1.7% seat belt wearing rate. Further analysis reveals that there is a relationship between seat belt use and the age group of the vehicle occupants at  $p < 0.005$ .

### 4.4. Seat belt use as a function of vehicle type and usage

Table 1 shows that the highest driver seat belt wearing rate was among large bus drivers (88.9%) and the lowest rate being associated with taxi drivers (10%). Front-right passengers in SUV are more likely to use the seat belt (42.1%) than those in private cars (13.6%), with



**Table 1.** Observed seat belt use by drivers, front-right passengers and two rear-seat passengers.

Variables	Drivers		Front-right passenger		First rear-passenger		Second rear-passenger	
	% Belted	No. Observed	% Belted	No. Observed	% Belted	No. Observed	% Belted	No. Observed
<i>Vehicles</i>	22.2	3451	6.3	1728	0.2	1264	0	1176
<i>Gender</i>								
Male	17.9	3010	2.4	1324	0.2	1168	0	1176
Female	51.9	441	19.1	404	1.0	96	0	0
<i>Age-group, driver</i>								
<26 years old	63.3	60	–	–	–	–	–	–
26–50 years old	21.1	3350	–	–	–	–	–	–
>50 years old	46.3	41	–	–	–	–	–	–
<i>Age-group, passenger</i>								
<18 years old	–	–	1.7	73	0	0	0	1176
18–50 years old	–	–	6.5	1655	0.2	1264	0	0
>50 years old	–	–	0	0	0	0	0	0
<i>Vehicle type</i>								
Private sedan car	30.8	1235	13.6	360	1.3	154	0	141
SUV	57.3	248	42.1	95	1.8	56	0	52
Taxi	10	1504	1.3	913	0	749	0	723
Minibus	15.3	354	1.8	276	0	242	0	227
Large bus	88.9	45	5.3	57	0	63	0	33
Heavy truck	4	25	0	19	0	0	0	0
<i>Vehicle usage</i>								
Private	33.7	1374	20.6	408	1.7	174	0	159
Commercial	10.3	1863	1	1194	0	988	0	952
Company	84.8	46	28.1	32	0	29	0	25
Government/ institutional	58.1	129	4.7	85	0	73	0	40

Source: Authors' Field Survey, 2016.

the least being among front-right passengers in Taxi (1.3%). As indicated in Table 1, the highest rate of seat belt use was among Company drivers (84.8%) followed by Government/Institutional drivers (58.1%) with the least from taxi drivers (10.3%). Front-right passengers in company vehicles tend to wear their seat belt (28.1%) more than those from government institutions (4.7%) and in commercial vehicles (1%). Only 1.7% of first rear-seat passengers in private vehicles were observed to use the seat belt. None of the rear-seat passengers in the other vehicles wore seat belt. In all, only three (3) rear-seat passengers out of 2440 observed used their seat belt representing a mere 0.1% compliance level.

#### 4.5. Relationship between restrained driver and restrained first-right passenger

As indicated in Table 2, 16.7% of the front-right passengers were belted because the drivers were also belted compared to just 3.4% of front-right passengers wearing their seat belt

**Table 2.** Front-right passenger seat belt use in relation to Driver belt use.

Driver wearing a seat belt?	Front-right passenger in seat belt?		Total	p-value
	Yes n(%)	No n(%)		
Yes	63 (16.7)	314 (83.3)	377 (21.8)	0.000
No	46 (3.4)	1307 (96.6)	1353 (93.7)	
Weighted total	109 (6.3)	1621 (93.7)	1730 (100.0)	

Source: Author's Field Survey, 2016.

when the drivers were not restrained. Generally, front-right passengers were roughly 5 times likely to use the seat belt if the driver was belted ( $p < 0.001$ ). A further analysis as shown in Table 2 using Pearson chi-square shows that there is a relationship between restrained drivers and restrained first-right passengers at  $p < 0.001$ .

## 5. Discussions

This study sought to assess seat belt use on the University of Cape Coast campus, Ghana. It was revealed in the study that seat belt use by vehicle occupants such as drivers, front-right passengers, first and second rear-seat passengers was low in that order. Female drivers and passengers tend to use seat belt more than their male counterparts. Restrained drivers are more likely to have restrained front-right passengers.

Ghana is one of the middle-income countries with compulsory seat belts use for all vehicle occupants. This indicates that irrespective of the geographical setting (national, urban or rural road network; university environment or outside university environment), vehicle occupants are to use seat belts. However, the observed seat belt use by vehicle occupants was low as in a similar study conducted at the University College Hospital (UCH), Nigeria, a low-income country (Sangowawa et al., 2005). Generally, some of the reasons for low use of seat belt in Ghana like other LMICs are the non-availability of the seat belt in the vehicle, faulty seat belts, perceived risk, discomfort and tidiness of seat belt, inadequate knowledge of the use of seat belt and low enforcement of traffic regulations (Driver & Vehicle Licensing Authority, 2010; Sam, 2015).

The current study reveals a better rate of seat belt use as compared to Afukaar et al.'s (2010) study in Kumasi, Ghana. This confirms the assertion that university environment with higher socio-economic characteristics (such as higher educational level and income) will have a better rate of seat belt use. Vehicle occupants in university campuses are supposed to know the benefits of seat belts use because of their educational status (Clark, 1993; Clark et al., 1999; Clayton & Helms, 2009)).

Gender, age, type of vehicle, use of vehicle and seating positions affect the use of seat belt irrespective of geographical setting in both the developing and developed countries (Sam, 2015; Sangowawa et al., 2010; Simons & Edunyah, 2014; Simsekoglu & Lajunen, 2008; Yannis et al., 2011). Out of which, gender, age and the seating positions play a significant role in the use of seat belt (Sam, 2015; Yannis et al., 2011). Female vehicle occupants irrespective of the seating position use seat belts more because they have a higher risk perception (Crandon et al., 2006; Sam, 2015; Sangowawa et al., 2010; Şimşekoğlu et al., 2013). The low seat belt use by male vehicle occupants in the current study predisposes them to the vicissitudes of RTCs as in big towns and cities in LMICs (Afukaar et al., 2010; Sam, 2015; Simons & Edunyah, 2014; Simsekoglu & Lajunen, 2008; Yannis et al., 2011).

Seat belt use is also related to the age of the vehicle occupants (Afukaar et al., 2010; Han et al., 2015; McCartt & Shabanova Northrup, 2004; Yannis et al., 2011). Generally, young vehicle drivers tend to use seat belt the least in addition to showing other risky behavior such as speeding and running red lights (Afukaar et al., 2010; Yannis et al., 2011). But in the current study, young adult drivers used seat belts most and this is consistent with the findings in Popoola et al. (2013). Besides, they are aware of the risk posed without the seat belts in the event of RTCs. On the other hand, passengers aged 18–50 years old (intermediate) used the

seat belts the most. The low rate of seat belt by passengers aged <18(young) indicates lack of supervision by other older passengers (>18) as stipulated in the Road Traffic Act 2004.

The use of seat belt by rear passengers is observed to be low as in other low (e.g. Nigeria), medium (e.g. Egypt) and high income countries (e.g. Greece) having national laws for all vehicles occupants (Koushki, Bustan, & Kartam, 2003; McIlvenny et al., 2004; Sangowawa et al., 2010; Yannis et al., 2011). The reason for very low usage of the seatbelt by rear-seat passengers in low and medium income countries is not far-fetched; certain vehicles such as buses and trucks were almost never fitted with seat belts. In vehicles, where seat belts were more uniformly distributed between the front and rear seat passengers, usage will be significantly higher among front-right passengers than the rear-seated passengers. Moreover, there is a belief that current seat belt law in Ghana is enforced for only drivers and front seat passengers (Popoola et al., 2013). The drivers hurriedly wear seat belts and inform the front right passengers to do same on approaching a police checkpoint.

Not being restrained increases the chance of severity of injuries or fatality. This poses threats to the other vehicle occupants who may use the seat belt (Koushki et al., 2003; McIlvenny et al., 2004). Vehicle occupants in commercial vehicles have been observed to use seat belts the least (Afukaar et al., 2010; Colgan et al., 2004; Popoola et al., 2013; Routley et al., 2008; Sangowawa et al., 2010). This is attributed to the nature of the work of commercial drivers as passengers come onboard and disembark rather more frequently thereby requiring their attention. Therefore, commercial drivers make frequent stops to attend to passengers' need, which makes it rather inconvenient for the drivers to use seat belts. On the part of passengers, the comfort ability, tidiness and unavailability of seat belt is a cause of non-use of seat belts in commercial vehicles.

There is high incidence of seat belt wearing among drivers of large buses in the current study. These buses are likely to be institutional buses owned by UCC and the university periodically organizes road safety training courses for all those drivers. This is consistent with the findings in Simons and Edunyah (2014) that road safety education influences the rate of seat belt use by company and institutional/government drivers.

## 6. Conclusions and recommendation

The current study has revealed seat belt use in a university campus to be low and comparable to other studies conducted in Kumasi and Tarkwa Nsuaem, Ghana. Seat belt wearing rate in UCC is similar to what was found in big towns and cities in Ghana in spite of the higher educational and socioeconomic status associated with university campuses. This is also not different from the generally low seat belt use in LMICs.

The low rate of seat belt use among vehicle occupants in UCC is a road safety concern. There is, therefore, the need to intensify road safety campaign and interventions in the university environment. The University Transport Management should authorize the security personnel manning the entrances/exits of the university to ensure that all vehicle occupants entering or leaving the university campus wear seat belts as a precursor to reducing severity or fatality of RTCs. Defaulter should be denied entry into the university. UCC as a citadel of learning hosts students, workers and members of the academia who are very important sets of people in nation building. Any life lost on the university campus involving any of these categories have multiplier effects on the university environment, the victims' families and the Ghanaian economy.

As elicited in the paper, front-right passengers are more likely to use seat belts when the drivers use theirs. In general, however, seat belt use among motor vehicle passengers is unacceptably low and compliance is virtually non-existent with rear-seat passengers. Hence, enforcements of seat belt use by the law enforcement agencies such as MTTD of the Ghana Police Service should be intensified. The law enforcement agencies are to intensify efforts to improve upon seat belt use by commercial vehicles in coloration with the security section of the university.

A targeted road safety initiative for male and commercial drivers can be designed by the University Transport Committee in collaboration with the NRSC and the Commercial Transport Operators Union. Bill boards indicating the benefits of seat belt can be mounted at the entrances/exits of the university emphasizing the benefits of seat belts to these class of vehicle occupants because of their low compliance level.

The limitation to the study is the geographical restriction to the University campus. Therefore, the results may not represent the seat belt rate in the Cape Coast Metropolis. A comparative study can be conducted to assess the rate of seat belt use in the Metropolis-University environment and outside the university environment. Additionally, the study will reveal the rate of seat belt use in the Metropolis.

Another limitation is that the study was to assess the use of seat belt but did not check for the availability of seat belts in the observed vehicles. A study can be conducted to assess the availability and type of seat belts in the vehicles and its corresponding usage. Furthermore, the age group of the observed vehicle occupants was a product of guess work. This may not represent the actual age group of the observed. However, this does not affect the result of the study in anyway. A similar study can be conducted to assess the self reported use of seat belt which can address this limitation in the study.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## ORCID

Thomas Ojo  <http://orcid.org/0000-0001-9737-9827>

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