

Mobile phone use among commercial drivers in Ghana: An important threat to road safety

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SUMMARY

Background: Ghana passed a law in 2012 banning the use of mobile phones while driving. However, data on compliance to the law has been lacking.

Objective: To examine factors associated with mobile phone use while driving among Ghanaian commercial drivers.

Methods: A survey was conducted among 627 commercial drivers (98.0% response rate). Bivariate and multivariate logistic regressions were performed to determine how *a priori* covariates influenced commercial drivers' use of phones while driving. The covariates included driver age, education, driving route distance, driving under the influence (DUI), and knowledge that phone use during driving causes distraction.

Results: Respondents were aware of the law (94.7%) but compliance was low (38%). Drivers who did not believe that cell phone use contributed to crash risk were more likely to report distracted driving (AOR 2.02,95%CI 1.05-3.9). Drivers who had completed primary (AOR 4.49,95%CI 1.14-17.78) or at least senior high school (AOR 6.89,95%CI 1.5-31.59) had increased odds of using the phone while driving, compared to those having no formal education. Drivers with 6-10 years (AOR 2.00,95%CI 1.00-3.98) or >10 years driving experience (AOR 2.87,95%CI 1.24-6.62) were more likely to report distracted driving compared to those with ≤5 years' experience. Drivers who travelled longer distances were more likely to report distracted driving (AOR 2.41,95%CI 1.23-4.71). Those who had never engaged in DUI were less likely to use the phone while driving (AOR 0.06,95%CI 0.01-0.43).

Conclusion: Future prevention efforts for distracted driving in Ghana will require targeted distracted driving enforcement and education for commercial drivers and their passengers.

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Keywords: Mobile phone, commercial drivers, Ghana, road safety, distracted driving

INTRODUCTION

Road traffic injuries contribute to 1.25 million deaths worldwide annually, with 90% occurring in low- and middle-income countries (LMICs).^{1,3} In Ghana, road traffic crashes cause an average of 6 deaths daily.^{4,5} Poor traffic infrastructure, limited investment in pedestrian safety, inadequate road maintenance, high vehicle speeds, and impaired driving have been identified among factors that influence road traffic crashes and the injuries they cause.^{6,7}

The growing use of mobile phones in everyday life has resulted in increased cell phone use among drivers. The World Health Organization in 2011, reported an 11% prevalence of mobile phone use while driving.⁸ Phone use distracts the driver, delaying reaction to traffic signals, increasing lapse in decision making and reducing awareness of other vehicles and pedestrians.⁹ Ghana passed a law, Road Traffic Regulations, 2012 (L.I 2180), in 2012 banning the use of mobile phones while driving.¹⁰

However, data on phone use while driving is lacking. We aimed to identify the proportion of Ghanaian commercial drivers who use phones while driving and examined factors associated with their reported use.¹⁰ Through this work, we plan to highlight target areas for an intervention to reduce distracted driving in Ghana.

METHODS

Setting

Kumasi is the second largest city in Ghana, with a population of 1.7 million. We conducted a survey of commercial drivers at Kejetia, the largest lorry station in Kumasi. There were 19 registered driver unions operating in the station with around 1,000 vehicles that serve over 30,000 passengers daily. Lorry routes range from short intercity trips to longer trips to neighboring countries.

Sampling and Data Collection

We conducted a cross-sectional survey of commercial drivers, all of whom use mobile phones. In 2015, over 80% of the Ghanaian population owned a mobile phone.¹¹ Assuming this as the prevalence of mobile phone use among commercial drivers, we estimated a sample size of 640 drivers for the survey, using the Cochran Sample Size Estimation Equation.¹²

The 19 recognized driver unions at the Kejetia lorry station were assigned random numbers with the help of a random number generator. The generated numbers were then listed in order of ascending magnitude and unions corresponding to the first 10 numbers were selected.

From within each union, a convenience sample of 64 drivers was selected as the unions had comparable memberships. No incentive was provided for participation. A two-page oral questionnaire was developed to assess commercial drivers' viewpoints and practices on mobile phone use while driving. The survey was conducted by research assistants who underwent training that emphasized techniques such as managing interview environment, active listening, open questioning and probing techniques.

The survey was conducted in Ashanti Twi and back-translated into English to ensure validity of verbal translation. Verbal consent was obtained from all drivers before the interviews. All data were collected anonymously with data extraction sheets and entered in Excel (Microsoft Corp., USA) for data cleaning.

Data Analysis

Data were analyzed using STATA v14 (StataCorp, USA) and expressed with descriptive statistics. Bivariate and multivariate logistic regression was performed to determine the factors that influence commercial driver report of cell phone use while driving.

The multivariate model included *a priori* covariates considered to contribute to the outcome (*e.g.*, driver age, educational background, and distance of driving route, driving under the influence (DUI), and knowledge that phone use during driving causes distraction).

Ethics

The study was approved by The Kwame Nkrumah University of Science and Technology Committee for Human Research and Publication Ethics (Reference number: CHRPE/AP/204/15). It was also reviewed by University of Washington Human Subjects Division and found to be exempt (Document number: 1207; Version # 3.0-03/27/2015).

RESULTS

Demographics and Driving Characteristics

We approached 640 drivers; 98.0% agreed to participate in the anonymous survey. The median age of drivers was 36 years. All drivers surveyed were males. Most drivers had completed primary school education (6 years) (77.4%). The median driving experience was 15 years; over one-third had over 10 years of driving experience. Almost all the drivers owned a license fit for the type of vehicle they drove.

The majority learned commercial driving skills as a driver's mate/assistant. Sixty-one percent drove larger lorries with capacity to seat 18 or more and the majority (87.9%) reported they had never driven under the influence of alcohol or drugs (Table 1).

Phone Use While Driving

The majority of drivers (96.4%) stated that they were aware of the law banning phone use while driving. However, 59.6% did not routinely comply with the law. Among drivers who reported phone use while driving, 44.6% stated they used the hands-free feature.

Drivers reported that the majority of phone use was to communicate with colleague drivers about events on the road, though this could not be independently verified. Over one-quarter of the respondents did not believe that phone use caused a distraction while driving.

Table 1 Demographic and characteristics of commercial drivers in Kumasi, Ghana (N=627)

Item	n	%
Age, median (IQR) years	36 (19– 65)	
Driving experience, median (range), years	15 (1 – 45)	
Duration of work per day, median (range), hours	6 (1 – 19)	
Education status		
None	21	3.3
Primary	485	77.4
Senior high	104	16.6
Tertiary	4	0.6
Missing	13	2.1
Working experience at lorry station		
≤ 5 years	203	32.4
6 - 10 years	186	29.7
> 10 years	234	37.3
Missing	4	0.6
Licensed to drive the vehicle they currently drive		
No	11	1.8
Yes	616	98.2
Method of training		
Driving school	44	7.0
On-the-job training	436	69.5
Taught by friend	111	17.7
Others	33	5.3
Missing	3	0.5
Vehicle type		
Taxi	7	1.1
Small van (≤ 17 seating capacity)	215	34.3
Large van (18 - 24 seating capacity)	384	61.2
Bus (25 - 32 seating capacity)	10	1.6
Missing	13	2.1
Driving route		
Short distance (within region)	485	77.4
Long distance (outside region)	139	22.1
Missing	3	0.5
Ever driven under the influence of alcohol or drugs		
No	551	87.9
Yes	73	11.6
Missing	3	0.5

Among drivers who reported that they used a cell phone while driving, 2.5% had been involved in a crash while using the phone, and 12.4% reported a near-crash event while using the phone (Table 2).

Factors associated with phone use while driving

In the multivariate model, reported cell phone use while driving was positively associated with a higher educational background, more driving experience, and a longer driving route distance (Table 3).

Our study found that drivers who believed cell phones did not contribute to crash risk were twice as likely to report distracted driving compared to drivers who were aware of the risks (AOR 2.02, 95%CI 1.05-3.9).

Distracted driving was also reported more commonly among drivers with a history of having driven under

influence and those who did not believe that phone use while driving caused distraction.

Table 2 Phone use while driving among commercial drivers in Kumasi, Ghana

	n	%
Knowledge of law banning mobile phone use while driving (N=616)		
No	22	3.6
Yes	594	96.4
Ever used the phone while driving (N=594)		
No	240	40.4
Yes	354	59.6
Function of phone used while driving (N=342)		
Making / Receiving calls	339	99.1
Texting	0	0
Browsing the internet	3	0.9
Reason for phone use while driving (N=329)		
Coworkers	263	79.9
Communicating with Family	16	4.9
Communicating with customers	50	15.2
Does mobile phone use distract you while driving? (N=429)		
No	117	27.3
Yes	312	72.7
Aware of risks of mobile phone use while driving? (N=585)		
No	48	8.5
Yes	537	91.5
Ever driven above state posted speed limit (N=612)		
No	395	64.5
Yes	217	35.5
Involved in car crash while using a mobile phone (N=354)		
No	345	97.5
Yes	9	2.5
Involved in near car crash while using a mobile phone (N=354)		
No	310	87.6
Yes	44	12.4

Compared to having no formal education, having completed primary (AOR 4.49, 95%CI 1.14-17.78) or at least a senior high school education (AOR 6.89, 95%CI 1.5-31.59) increased a driver's odds of using the phone while driving.

Commercial drivers with 6-10 years (AOR 2.00, 95%CI 1.00-3.98) or more than 10 years driving experience (AOR 2.87, 95%CI 1.24-6.62) had higher odds of using a phone while driving compared to those with five years or less experience.

Drivers who travelled longer distances (AOR 2.41, 95%CI 1.23-4.71) and those who did not believe that phone use caused distraction while driving (AOR 2.02, 95%CI 1.05-3.9) were more likely to engage in phone use while driving. Those who had never driven under the influence were much less likely to use the phone while driving (AOR 0.06, 95%CI 0.01-0.43).

Table 3 Factors associated with mobile phone use while driving among commercial drivers in Kumasi, Ghana

Variable	AOR	95% CI
Age	0.99	0.96 – 1.03
Educational background		
No education	Referent	
Primary	4.49	1.14 – 17.78
SHS and above	6.89	1.5 – 31.59
Driving experience		
≤ 5 years	Referent	
6 – 10 years	2.0	1.0 – 3.98
> 10 years	2.87	1.24 – 6.62
Driving route		
Short distance (within region)	Referent	
Long distance (outside region)	2.41	1.23 – 4.71
Yes		
No	0.57	0.01 – 0.43
Yes		
No	2.02	1.05 – 3.9

DISCUSSION

This study found that most commercial drivers at the Kumasi Kejetia lorry station were aware of the law banning phone use while driving in Ghana. However, relatively few drivers (40%) complied with the law. Among drivers who admitted to cell phone use while driving, 14.9% had been involved in a crash or near-crash event while using their phones on the road. Having a formal education, more driving experience, being a longer distance driver and believing that phone use did not distract from the task of driving increased drivers' odds of using the phone while driving. Drivers who reported they had never driven while impaired had reduced odds of using the phone while driving. Drivers stated that they most commonly used the phone while driving to communicate about events on the road.

Drivers with more driving experience were more likely to use a phone while driving. It is possible that these drivers become overconfident with driving experience or have less education on the risks of distracted driving. Drivers with more than five years' experience (regardless of age) were more likely to engage in risky driving practices like phone use while driving.¹³

Drivers who stated they were unaware of the distraction caused by phone use were twice more likely to use a cell phone while driving. There has not been unanimous agreement with this apparently logical finding; while there are studies supporting our finding,^{14,15} one report concluded that awareness of the risks posed by phone use does not influence its use while driving.¹⁶

Having formal education was associated with increased odds of a driver engaging in phone use while driving.

Higher educational level exposes drivers to the familiarity of phone use in general and may also be associated with higher incomes which enable cell phone use.¹⁶ It is unsurprising that drivers who do not engage in DUI were less likely to use a phone while driving. Drivers who complied with one safe driving law, such as not engaging in DUI, reported improved compliance with another safe driving law, such as refraining from phone use while driving.^{18,19}

Forty-five percent of drivers who used the phone while driving did so with the hands-free feature, although the practice is also not permitted under Ghanaian law. The use of hands-free while driving has been made obligatory in many countries.¹⁹ However, hands-free use still has the risk of cognitive distraction, and may offer only limited safety advantage over hand-held phone regarding road traffic crashes.^{8,19} It might even tempt drivers to use the phone more while driving by inducing a false sense of security. As the proportion of phone users increases in LMICs, it is imperative to change drivers' perception about hands-free use in order to avoid the distraction it causes during driving.^{13,21,22}

The study was limited by the survey capturing only self-reported behaviors. We were not able to directly observe distracted driving, nor were we able to examine crash or collision rates for drivers. Drivers may have felt pressure to provide socially acceptable answers; however social desirability bias may have been somewhat allayed in this anonymous study which did not collect any individual identifying information.

CONCLUSION

Although most commercial drivers at the Kumasi Kejetia lorry station know about the law banning phone use while driving, compliance rate remains low. Our study found that drivers who did not believe that cell phone use contributed to crash risk were twice as likely to report distracted driving compared to drivers who were aware of the risks.

Our study identified opportunities to improve education about Ghanaian laws prohibiting distracted driving for all drivers, including commercial drivers who may put many passengers and pedestrians at risk. International studies on distracted driving also suggest that education alone is unlikely to change behavior unless accompanied by enforcement efforts, as most drivers believe they are "safe" from crash, but feel at risk of a citation. Further studies involving observed cell phone use while driving and linkage to crash and citation rates are also needed to verify our findings.

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