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Unmatchability of mobile phone and handlebar: Predictors among professional motorcyclists at Cotonou (Benin)

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In Benin, professional motorcyclists represent a consistent part of transport services, particularly in the city of Cotonou. However, this activity remains poorly regulated, which contributes to the development of risky behaviors. Among these latter, there is not enough evidence about the use of mobile phones while driving. The study aims to estimate the prevalence of mobile phone use while driving and to identify the associated factors among professional motorcyclists in Cotonou. It was a cross-sectional study involving 430 registered professional motorcyclists at parking lots in Cotonou in 2019. Univariate and multivariate analysis by the logistic regression model was used to identify factors associated with mobile use while driving. The prevalence of mobile phone use while driving was 12.47%. Multivariate revealed that factors associated with mobile phone use during driving among professional motorcyclists were alcohol consumption (AOR=2.10; 95% CI: [1.15-3.83]) and service length less than 10 years (AOR=2.20; 95%CI: [1.15-4.71]). Given the place of professional motorcyclists in public transport system and the hazard for consumers, use of mobile while riding should necessarily be addressed through road safety interventions and law enforcement. Faced with conjunction of risk behavior among this population, the findings highlighted also the needs of integrative approach in interventions towards professional motorcyclists.

Key words: Mobile phone, risk factors, road traffic accident, Benin

INTRODUCTION

Nowadays, more and more people have access to a mobile phone and use the services associated with it, both in high-income countries and in low- and middle-income countries. It is estimated that about three-

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quarters of the world's population had access to mobile phones in 2017 (International Telecommunication Union, 2018). Like other African countries, Benin is witnessing a widespread use of mobile phones by all segments of the population. In 2017, the number of active mobile telephone subscribers was estimated at around 8.8 million, for a population of nearly 11.2 million (Autorité de Régulation des Communications Electroniques et de la Poste, 2018). As the number of mobile phone holders increases, their use in places other than home or service such as in vehicles is also increasing. In this context, it is now common to observe road users using their phones to make or answer calls, consult or even write messages, or even seek information; this despite the risks that such behaviour could induce in terms of road safety. According to the World Health Organization (WHO), drivers who use their mobile phones while riding are four times more likely than others to be involved in a road accident (RA) (Organisation Mondiale de la Santé, 2019). A meta-analysis of 33 studies also indicate that telephone use while riding increases driver reaction time by an average of 0.25 s (Caird et al., 2008). Mobile phone use while riding concerns both users of four-wheeled vehicles and users of two-wheeled motorized vehicles. The situation of users of two-wheeled vehicles is more worrying because the stability of the vehicle is less guaranteed, and in the event of crash, the driver has no physical protection.

In Benin, road transport is characterized by a high use of two-wheeled motor vehicles and the emergence for several years of professional motorcyclists, motorcycle taxis (a mode of public transport of people and/or goods by means of a motorcycle) which today represent the main part (75%) of transport services, particularly in the city of Cotonou (Djossou, 2014). The Professional Motorcyclist (PM) who uses his telephone when riding is at high risk of road accidents and constitutes a danger to himself, his passenger and other road users. A better understanding of the extent of this behaviour among PMs and the factors associated with it is the first step in implementing interventions to reduce the phenomenon to contribute to the reduction of RAs and their consequences. This study, in order to help answer these key questions, aims to estimate the prevalence of telephone use while riding and identify the associated factors among PMs in Cotonou in 2019.

METHODS

Study settings

The study was carried out in the city of Cotonou, the economic capital of Benin. The territory covers an area of 79 km^2 organized in 13 boroughs. Transport plays an important role in Cotonou, which is characterized by a concentration of most of the country's economic activities and an agglomerate population of more than one million inhabitants. Transport enables ensuring that the internal traffic essential for the supply of consumer goods, in particular food products and PM ensures a significant proportion of this traffic. The number of active PMs in Cotonou is estimated at 120,000 in 2017 according to statistics from the National Road Safety Centre (Centre National de Securité Routière, 2018).

Type of study, population and sampling

This was a cross-sectional study with an analytical focus and the data collection period extended from March 25 to April 19, 2019. A cluster sampling technique adapted from WHO were applied to select the PMs included in the study. The primary units were the PM parking lots while the secondary units were represented by the PMs registered at the level of the selected parks and who gave their free, written and informed consent to participate in the study. The minimum sample size calculated according to the Schwartz formula was 324 PM based on an expected prevalence of 50%, a cluster effect of 1.5 and a 10% increase to prevent non-response (Mendenhal et al., 2008).

Variables

The dependent variable was mobile phone use while riding. It was informed on the basis of a self-assessment and categorized into two modalities: "Yes" if a PM declared having access to a mobile phone and was used to using it (calling and/or sending SMS) when riding and "No" if a PM does not have access to a mobile phone or declared having a mobile phone and not used to using it when riding. The other variables retained were: (i) Socio-demographic characteristics: age (in years), sex, marital status (single or living alone/married or living with a partner), level of education (educated/uneducated), (ii) occupation-related variables: length of service (in years), type of driver (Permanent/Occasional), daily income (US dollars), possession of at least one type of riding license (Yes/No), history of RA as a PM (Yes/No), and (iii) other risk behaviors: alcohol consumption (Yes if the PM reported himself as a regular alcohol consumption/No).

Data collection, processing and analysis

The structured interview with a questionnaire was used for data collection. The data were entered with the Epi Info 7.2 software and analyzed under Stata/SE 15.1. Data analysis consisted of calculating weighted percentages for qualitative variables, weighted means and standard deviations for quantitative variables with normal distribution. The median and interquartile intervals were determined for quantitative variables that did not follow a normal distribution. A multivariate logistic model was used to identify the factors associated with mobile phone use while riding. In the multivariate analysis, only variables with a univariate $p < 0.20$ were introduced into a top-down step-by-step model to obtain adjusted estimates. The results were presented as Odds Ratio (OR) with their 95% confidence interval (CI95%). The level of significance has been set at 5%. The Hosmer-Lemeshow test was used to verify the adequacy of the final model.

Ethical statement

The study protocol was approved by the Institutional Review Board of Regional Institute of Public Health and was conducted with respect of confidentiality. The data collected from the targets were anonymous and confidential. They were collected individually after

obtaining the free, written and informed consent of each MP surveyed. Prior to this, the targets received a detailed briefing note.

RESULTS

Four hundred and thirty (430) PMs were enrolled in this study. The average age of the targets were 38.44±0.42 years with extremes ranging from 20 to 60 years. No female PMs were included in this sample. Most PMs were educated and married. Nearly eight (8) out of ten (10) MPs had no other activity in parallel with their PM activity. It is also noted that about 90% of PMs generally earned less than 5,000 CFA francs (9 US dollars) per day. About 30% (95% CI: [26.17%; 35.00%]) of PMs reported a history of alcohol use. The median length of service of PMs was 5 years (3; 13). Nearly 27% of MPs have already been victim of an RA. In addition, nearly one-quarter of our targets had a driver's license with a predominance of a B license (Table 1).

Almost all (98.33%) of the PMs had a mobile phone. The prevalence of mobile phone use while riding was 12.47% (CI95%: [9.61% - 16.02%]). After multivariate analysis using the logistic regression model, we obtained a final model where alcohol consumption and length of service were significantly associated with mobile phone use while riding (Table 2). MPs who reported a history of alcohol use were 2.10 times more likely to use their mobile phones when riding their vehicles adjusted for length of service. MPs with ten (10) years or less of length of service were 2.20 times more likely to use their mobile phones while riding than those with more than 10 years of length of service who knew their alcohol consumption.

DISCUSSION

The objective of this study was to estimate the prevalence of mobile phone use while riding among PMs in Cotonou (Benin) and to identify the factors predicting this behavior in this population.

The results show that just over one in 10 PMs surveyed used their mobile phones when riding their vehicles. This prevalence is much higher than that observed in other studies, which recorded a frequency of mobile phone use while riding ranging from 0.4 to 8.4% among motorcyclists (Du et al., 2013; Pérez-Núñez et al., 2014, Truong et al., 2019). This could be due either to differences in the targets studied or to differences in the design of these three studies compared to our study. Indeed, on the one hand, PMs could generally be more at risk than other motorcyclists. On the other hand, these studies were based on observations in fixed posts. Under these conditions, the reliability of the information depended on the accuracy with which the observer recorded the behavior when the vehicle passed by and on the representativeness of the observation site (World Health Organization, 2011). Although these studies are based on a large sample, a limited representativeness of the observation sites could explain the low prevalences that were recorded. In addition, in 2018, in a cross-sectional study of 750 "motorboys" (motorcyclists who make deliveries, transport goods or perform small services, such as paying bills or making deposits in banks) in Brazil, the frequency of mobile phone use while riding was almost two (2) times higher than the one we recorded. It were about 23% (da Silva et al., 2012). This difference corresponds to the specific nature of this target group, which performs different services and is therefore more likely to use its telephone when riding to take new orders or report to customers.

Since the sample was mainly male, the association between gender and telephone use while riding was not studied. In other studies conducted in Benin on PM on other topics, samples of male drivers only had already been observed (Djossou, 2014, Lawin et al., 2018). In addition, gender has already been reported as significantly associated with mobile phone use while riding. Indeed, compared to men, women were half as likely to use a mobile phone when riding a vehicle (OR = 0.48; p <0.001) (Truong et al., 2019).

Our results suggest that less experienced PMs are more likely to use their mobile phones when riding their vehicles than their much more experienced counterparts. Inexperienced drivers would be more likely to engage in this behavior due to a lack of awareness of the risks associated with it. The fact that inexperienced drivers are more likely to use their mobile phones while riding may also be due to the fact that they are younger in terms of age: some authors have reported an association between young age and mobile phone use while riding (Truong et al., 2019). However, in this case, age could play the role of a confounding factor in the relationship between professional riding experience and the use (or not) of a mobile phone while riding.

Alcohol consumption has also been identified as a factor associated with mobile phone use while riding. It would appear that people who engage in risky behaviors such as alcohol consumption are also those who tend to engage in other risky behaviors such as mobile phone use while riding (World Health Organization, 2011). In 2018, the results of a study indicated that people who admitted to riding a motorcycle under the influence of alcohol were more likely to use a mobile phone while riding (OR = 1.822; p <0.05) (Truong et al., 2018). This conjunction reinforces the relevance of the approach to integrating the interventions to be implemented for the prevention of risk behavior in road traffic. The specific target of PMs should be given particular attention with regard to the provision of interventions, due to their place in the public transport system and the risks faced by populations. The legislation currently in force does not yet

Table 1. Socio-demographic features of professional motorcyclists at Cotonou, Benin, 2019.

Variable	Weighted average ± standard deviation	Frequency	Weighted percentage
Age (years) (n = 426)	38.44±0.42		
Sex (n = 430)			
Male		430	100
Marital status (n = 428)			
Married/living with partner		395	92.29
Single/living alone		33	7.71
Level of education (n = 428)			
Educated		293	68.63
Uneducated		135	31.37
Type of driver (n = 428)			
Occasional		96	22.71
Permanent		332	77.29
Daily income (US dollars) (n = 401)			
Less than 9		363	90.56
9 and more		38	9.44
Riding licensee (n **=** 419**)**			
Yes		97	23.13
No		323	76.87
Alcohol consumption (n = 421)			
Yes		128	30.41
No		293	69.59
History of road accident (n **=**428**)**			
Yes		118	27.79
No		311	72.21
Having a mobile phone (n = 425)			
Yes		418	98.33
No		7	1.67

take into account the use of mobile phones when riding, which becomes imperative with the importance of the phenomenon and particularly among PMs. The integration of this theme into MPs' awareness campaigns on other high-risk behaviors, including the use of psychoactive substances and riding under influence, is justified with the results of this study. In addition, a peer awareness approach will take into account experience and seniority as a protective factor in the adoption of this risky behavior.

The results have yet to be qualified, taking into account the limitations of the study. These reside on the one hand in its transversal nature, which does not make it possible to establish the prior nature of exposures. In addition, an information bias cannot be totally excluded as the use of the telephone while riding having been informed on the basis of self-assessment. This does not affect the results, which already provide guidance for planning and which could be refined by other studies with more advanced analytical approach.

Table 2. Multivariate analysis-factors associated to use of mobile phone while riding among professional motorcyclists, Cotonou-Benin, 2019.

Variable	Univariate analysis			Multivariate analysis*		
	OR	95%CI	p-value	Adjusted OR	95%CI	p-value
Age (years)	0.97	[0.94-1.03]	0.109			
Marital status						
Married/living with partner	2.21	[0.51-9.63]	0.286			
Single/living alone	1					
Level of education						
Educated						
Uneducated	1.02	[0.54-1.90]	0.948			
Type of driver						
Occasional	1					
Permanent	1.09	[0.53-2.24]	0.795			
Daily income (US dollars)						
Less than 9	1					
9 and more	1.29	[0.82-2.01]	0.259			
Length of service (years)						
0 – 10	2.06	[0.96-4.41]	0.061	2.20	[1.15-4.71]	0.040
11 and more	1			1		
Riding license						
Yes	1					
No	1.15	[0.56-2.35]	0.695			
Alcohol consumption						
Yes	1.97	[1.08-3.59]	0.025	2.10	[1.15-3.83]	0.015
No	1					
History of road accident						
Yes	1					
No	1.07	[0.55-2.07]	0.827			

* p-value (Hosmer-Lemeshow): 0.961.

Conclusion

It appears that a relatively high proportion of PMs use their mobile phones when carrying out their professional activities. The situation is worrying given the importance of the PM sector in Benin in general and Cotonou in particular. These results should serve as a basis for advocacy for the development, adoption and enforcement of regulations on mobile phone use while riding. Primary prevention interventions must also be planned in order to best contribute to road safety and the improvement of the health status of populations.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

Autorité de Régulation des Communications Electroniques et de la Poste B (2018). Rapport annuel d'activité 2017. Cotonou, ARCEP: 89.

Caird JK, Willness CR, Steel P,Scialfa C (2008). A meta-analysis of the effects of cell phones on driver performance. Accident Analysis and Prevention 40(4):1282-1293. https://doi.org/10.1016/j.aap.2008.01.009.

Centre National de Securité Routière (2018). Annuaire des statistiques de accidents de la voie publique au Bénin 2016. Cotonou.
da Silva DW, Andrade SMD, Soares DFPDP, Mathias TADF, Matsuo T, de Souza RKT (2012). Factors associated with road accidents among Brazilian motorcycle couriers. The Scientific World Journal, 2012.
Djossou GN (2014). Analyse des risques et des déterminants du choix de l'activité de taxi-moto à Cotonou (Bénin). Premier Colloque de The Theoretical and Applied Economic Association (TAEA).
Du W, Yang J, Powis B, Zheng X, Ozanne-Smith J, Bilston L, Wu M (2013). Understanding on-road practices of electric bike riders: an observational study in a developed city of China. Accident Analysis and Prevention 59:319-326.https://doi.org/10.1016/j.aap.2013.06.011.
International Telecommunication Union (2018). Rapport Mesurer la Société de l'Information- Résumé analytique. Geneva, ITU: 10.
Lawin H, Fanou LA, Hinson V, Tollo B, Fayomi B, Ouendo EM (2018).Facteurs de risque professionnel et perceptions de la pollution de l'air chez les taxis motoristes à Cotonou, Bénin. Sante Publique 30(1):125-134.
Mendenhall W, Beaver RJ, Beaver BM (2008). Introduction to Probability and Statistics, Duxbury Press.
Organisation Mondiale de la Santé (2019, 2019/02/06/23:04:41). "Principaux repères sur les accidents de la route." from https://www.who.int/fr/news-room/fact-sheets/detail/road-traffic-injuries.
Pérez-Núñez R, Hidalgo-Solórzano E, Vera-López JD, Lunnen JC, Chandran A, Híjar M, Hyder AA (2014). The prevalence of mobile phone use among motorcyclists in three Mexican cities. Traffic injury prevention 15(2):148-150. https://doi.org/10.1080/15389588.2013.802776.
Truong LT, Nguyen HT, De Gruyter C (2018).Correlations between mobile phone use and other risky behaviours while riding a motorcycle. Accident Analysis and Prevention 118:125-130. https://doi.org/10.1016/j.aap.2018.06.015.
Truong LT, Nguyen HT, De Gruyter C (2019). Mobile phone use while riding a motorcycle and crashes among university students.Traffic injury prevention 20(2):204-210. https://doi.org/10.1080/15389588.2018.1546048.
World Health Organization (2011). L'utilisation des téléphones mobiles : la distraction au volant, un problème qui s'aggrave. Organisation mondiale de la Santé.