

Can Professional Motorcyclists Be an Asset in the Immediate Post-Crash Care System in Benin? Baseline of Knowledge and Practices in the City of Cotonou (Benin)

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Purpose: The situation of road crashes-related deaths remains problematic in low-income countries. The present study aims at analyzing the first-aid knowledge and practices of professional motorcyclists (PMs) in the city of Cotonou in Benin.

Materials and Methods: This is a cross-sectional analytical study conducted from 25 March to 19 April 2019 in Cotonou and concerned PMs registered in a fleet who gave their consent to participate in the study. The World Health Organization's two-stage adaptive cluster sampling technique was applied to select the eligible PMs while respecting the proportionality rate per fleet. A logistic regression analysis was done and the odds ratios were estimated with 95% confidence interval.

Results: The 430 PMs surveyed were all middle-aged men with an average age of 38.38 (± 8.70). Among them, 62.56% knew at least one of the emergency phone numbers for the ambulance, police or fire services and 49.53% of the PMs knew at least one of the 3 techniques evaluated. In addition, 33.23% of PMs who had witnessed at least an RC stated that they had alerted the emergency services, and 32.27% said they had helped the victims. The main reason given for the lack of initiative in RCs was lack of knowledge of the course of action to take (19.64%). The level of knowledge was associated with the level of education (AOR: 3.11; CI 95%: 1.79–5.43) and with the length of experience (AOR: 2.56; CI 95%: 1.58–4.18).

Conclusion: This study reveals that the level of knowledge and practice of PMs in the field of first aid in Cotonou is low and demonstrates the relevance and the need to include this target group in the first-aid chain for road crashes in Benin.

Keywords: road crashes, first aid, motorcycles, professional corporations

Introduction

According to most recent estimates by the World Health Organization (WHO), there are still more than one million road deaths per year. The situation in low-income countries is more critical because road crashes (RC) mortality has not improved since 2013, with death statistics that have not declined and a risk of pre-hospital mortality that is twice as high as in high-income countries.^{1,2}

According to the literature, nearly 40% of pre-hospital deaths can be prevented with basic first-aid care. As such, the responsiveness and efficiency of the immediate post-crash management system help to reduce pre-hospital mortality in RCs.^{3–6}

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In developing countries, there is evidence that immediate post-crash management systems are inefficient and ineffective.⁷⁻⁹ In these contexts, it is therefore necessary to propose appropriate strategies to improve these systems. In the case of RCs, there is an opportunity to intervene at the scene of the crash. Witnesses or those who arrive first at the scene of an RC can play a vital role in the provision of emergency care, and contribute significantly with basic first aid.¹⁰⁻¹² First-aid measures are a set of basic methods and techniques that are properly implemented to relieve urgency and reduce mortality in the pre-hospital setting.¹³ Interventions by laypersons in the case of RCs are not uncommon; however, their nature, relevance and effectiveness remain to be demonstrated, although the goodwill of the parties concerned cannot be denied.^{12,14,15} They vary greatly in nature, ranging from families to taxi drivers, and intervene, to varying degrees, in the majority of cases.^{14,16} To hope for the effectiveness of these interventions, it is necessary at least that the interveners have a satisfactory level of knowledge and practical skills in the domain. According to the literature review, the level of knowledge and practice of first aid is usually low among laypersons.^{17,18} However, several studies have also shown on the one hand, that the level of knowledge is associated with the level of practice and on the other hand that training can improve both the level of knowledge and practice of first aid.¹⁷⁻²⁰

In Benin, professional motorcyclists (PMs) are the most common type of mobile layperson, especially in large cities. In the case of RCs, they are most often the first on the scene. With the required skills, they could represent a real opportunity for alerting and administering first aid before the arrival of the emergency services. To support the strategic decisions aimed at improving the chain of intervention in immediate post-crash situations in Benin, this study aims at analyzing the knowledge and practices of professional drivers in first aid in the city of Cotonou in Benin.

Materials and Methods

Framework of the Study

The study was conducted in Benin, a country in West Africa. It is a coastal country that covers about 115,000 km² and has a population of 11 million spread over 12 departments. Its economic capital, Cotonou, is located in the department of Littoral. It covers an area of 79 km² and has a resident population estimated at around

1 million. Internal road transport is provided largely (75%) by PMs.

In Benin, the profession of motorcycle driver emerged first in urban areas with the unemployment crisis and to meet an effective demand for transport. It is an informal sector activity that has not yet managed to be regulated. One of the reasons for the proliferation of PM is the relative ease of access into this business. Indeed, practicing this profession in Benin does not require any particular training. There is no training structure to become a PM, no level of education is required and there is no obligation to have a driving license. All that is required is the ability to ride a motorcycle that can be acquired by the PM himself or by working for a motorcycle owner through lease contracts. There are three kinds of PMs: those who are in the business permanently, those who do so to supplement their wages and those who go there while expecting to get a better job. In fact, the real number of PM in the country is not well known. The Integrated Modular Survey on Household Living Conditions (EMICoV) counted about 11,796 MTCs in Benin in 2007 and recent estimates put the figure at over 250,000 in 2017. In addition, a study carried out in 2012 estimated that there were 10,610 new entries registered per year in the city of Cotonou in this activity, bringing the number of PM in Cotonou from 80,000 to 160,000 between 2010 and 2013.^{21,22}

In cities, the PMs are organized as fleets; in Cotonou, these fleets contain about 80% of the PMs.²³ The fleets are small areas on the roadside, in the shade, often delimited by an enclosure (places where customers concentrate) that allow drivers to park their motorcycles safely during rest periods. These fleets are counted by city councils in their enumeration efforts and are the best structured way to find the PMs.

Concerning the accident data of the country, which are greatly underestimated,¹ the national road safety center reports an annual average of 5356 road crashes between 2008 and 2015 noted by the police forces with 49.25% involving at least one motorized two-wheel vehicle.²⁴⁻²⁶ The latter constitute the majority of the rolling stock in Benin whose statistics report 479 977 motorized two-wheel vehicles registered between 2016 and 2018 out of a total of 566 277 registered vehicles, ie 84.8%. However, it should be noted that the motorized two-wheel vehicles were not required to be registered until 2014 and that their real number may still be underestimated.^{27,28} According to national statistics on road crashes, in 2015, out of a total of

2893 road crashes involving at least a motorcyclist, 236 concerned PM, ie nearly 10%.²⁶

Study Design, Study Population and Sampling Procedure

It was a cross-sectional analytical study that took place from 25 March to 19 April 2019 in Cotonou. Included in the sample were PMs who were registered in a fleet and who gave their consent to participate in the study. The minimum sample size was calculated according to the Schwartz formula with a default prevalence of 50%, an accuracy of 5% and a threshold of 5%; the minimum number of subjects was estimated at 384 PMs. With a 10% increase for non-responses, we retained 430 PMs. The WHO's two-stage adaptive cluster sampling technique was applied to select the PMs to be included in the study while respecting the rate of proportionality per fleet. The sample frame was based on the list of PM fleets in the thirteen districts of the city, provided by the Cotonou city council.

Data Collection

The data was collected by questionnaire ([supplementary material](#)). The questionnaire was administered by interviewers previously trained on the filling. The data collection tool was previously tested on PMs selected on fleets not included in the study. The respondents were contacted and interviewed on the fleets.

Variables

Three main groups of variables were explored for PMs. The first group concerned socio-demographic characteristics (age, educational level, marital status), professional characteristics (status in the profession, professional experience, possession of a driving license), and PM history of RC (RC witness experience, RC victim experience). The second group involved variables related to the level of knowledge on raising the alert in the event of an RC and first-aid knowledge. To assess knowledge on raising the alert in the event of an RC, the variables used were knowledge of the legal duty to rescue, and knowledge of at least one emergency number for an RC (police or fire service). For first-aid act knowledge, the variables were knowledge of the lateral safety position (Yes/No), knowledge of wounds and hemorrhages management (Yes/No), and knowledge of fractures management (Yes/No). The various sources of information from PMs on alert and

first aid were examined. We assessed an overall level of knowledge on first aids which has been considered adequate if the PM knows at least one of the emergency phone numbers and if he knows at least a first-aid gesture among the 03 evaluated. The third group comprised the practice variables. These concerned only PMs who reported having witnessed at least one RC. Two variables were considered in this group: the act of raising the alert (Yes/No); and the practice of at least one first-aid action (Yes if reported/No). The reasons for non-practice were also explored. We also assessed an overall level of first-aid practice which was considered adequate if the PM declared having given the alert or performed a first-aid gesture. This variable mainly reflects the willingness to provide assistance, since the practices were self-reported and could not be directly observed. The overall level of first-aid knowledge and the overall level of first-aid practice were considered as the dependent variables and the associated factors were sought.

Statistical Analysis

The data were processed using the software Epi Info and Stata 15. The usual descriptive statistics were presented with comparison made with Pearson test of chi.² The factors linked to the level of overall knowledge of first aids and the level of overall practice in first aids were selected at a threshold of 20% using the univariate analysis and were added to a multivariate logistic regression model using a descending stepwise procedure. The associations were assessed using crude odds ratios and adjusted odds ratios (AOR) with a confidence interval of 95% (CI 95%). The adequacy of the final model was tested using the Hosmer and Lemeshow test. The threshold of 5% was retained for the meaning of statistical tests.

Ethical Statement

The study protocol received internal institutional ethical approval from the Regional Institute of Public Health under the reference number 038-EPIDEMIO/IRSP/2019. Data were collected anonymously after obtaining informed and written consent from the PMs. Confidentiality was respected for data processing.

Results

Descriptive Characteristics of PMs

The PMs in the sample were all middle aged with an average age of 38.38 (± 8.70). The typical profile was

that of a 30- to 44-year-old (77.71%), married or living in a couple (92.29%). About a third were uneducated. A large majority owned a mobile phone (98.33%). They were mainly permanent drivers (77.57%). The average length of professional experience was 8.4 (± 7.48) years with 42.52% of them having less than 5 years' professional experience. At least 22.14% of them had at least one driving license, and more than 4 out of 10 had already had experience of at least one RC (Table 1).

Table 1 Characteristics of Professional Motorcyclists, Cotonou, 2019

Variables	Frequency (n)	Percentage (%)
Socio-demographic characteristics		
Age (years)	314	
Less than 30	70	22.29
30 to 44	244	77.71
45 and more	112	35.67
Level of education	428	
Uneducated	135	31.54
Primary school	155	36.21
Secondary school at least	138	32.24
Marital status	428	
Unmarried	33	7.71
Married	395	92.29
Professional Characteristics		
Professional status	428	
Contract worker	96	22.43
Permanent driver	332	77.57
Length of experience (Years)	428	
Less than 5	182	42.52
5 to 9	104	24.30
10 and more	142	33.18
Possession of a driver's licence	420	
Yes	93	22.14
No	327	77.86
Background on RCs		
RC's witness experience	425	
Yes	313	73.65
No	112	26.35
Experience as a victim of an RC	426	
Yes	190	44.60
No	236	55.40

Abbreviation: RC, road crashes.

Level of Knowledge About Raising the Alert and Carrying Out First Aid in an RC

With regard to raising the alert, 93.19% of the PMs knew about the existence of legislation requiring the duty to rescue in an RC, 39.91% knew the number of the fire service and 23.94% knew the number of the police. In the sample, 62.56% of the PMs knew at least one of the emergency numbers: the police or fire service. For first responders, 49.53% of the PMs knew at least one of the 3 techniques evaluated. Specifically, 21.60% of the PMs were aware of the lateral safety position whereas the principles of management of injuries/hemorrhages was known by 13.15% of the PMs, and the management of fractures was known by 32.86% of them. There was also a small proportion of uneducated PMs who knew at least one emergency number compared to PMs with a minimum primary education level ($p = 0.000$). The proportion of PMs with knowledge of at least one first-aid technique was also lower in subjects under the age of 30 ($p = 0.015$), in those with less than 5 years of experience ($p = 0.000$), and in those who did not hold a driver's license ($p = 0.026$). This proportion was also higher among PMs who had already experienced an RC (Table 2). About 1 out of 10 PMs reported receiving information on first responder alert and response (46 PMs) and the main source of information was training in a variety of settings. The majority of them, 93.22%, reported being interested in first-aid training.

As far as the overall level of knowledge is concerned, it was adequate for 148 PMs out of the 430, ie a proportion of 34.42. After adjustment for the other variables in multivariate analysis, it appears that it is associated with the level of education with a higher probability of having an adequate overall level of knowledge among PMs with primary education (AOR: 2.77; CI 95%: 1.61–4.76) and those with minimum secondary education level (AOR: 3.11; CI 95%: 1.79–5.43) compared to uneducated PM. In the same trend, we note an association with professional seniority with a higher probability of having an adequate level of overall knowledge among PM between 5 and 10 years of seniority (AOR: 2.21; CI 95%: 1.3–3.76) and among PM with at least 10 years of seniority (AOR: 2/56; CI 95%: 1.58–4.18) compared to PM exercising for less than 5 years (Table 4)

Alert and First-Aid Practices in Road Accidents

Of the 430 PMs, 313 (73.65%) had already witnessed at least one RC. In this group, 33.23% said they had

Table 2 Knowledge for Raising the Alert and First-Aid Techniques in PMs in the Event of an AR (n=430), Cotonou, Bénin, 2019

Variables	Knowledge of Police or Fire Department Number					Knowledge of At Least One First-Aid Technique				
	Yes		No		p value	Yes		No		p value
	n	%	n	%		n	%	n	%	
Socio-demographic characteristics										
Age (years)					0.892					0.015
Less than 30	42	60.00	28	40.00		24	34.29	46	65.71	
30 to 44	153	62.70	91	37.30		126	51.64	118	48.36	
45 and more	71	63.39	41	36.61		62	55.36	50	44.64	
Level of education					0.000					0.078
Uneducated	64	47.41	71	52.59		57	42.22	78	57.78	
Primary school	109	70.32	46	29.68		78	50.32	77	49.68	
Secondary school at least	94	68.12	44	31.88		77	55.80	61	44.20	
Marital status					0.180					0.053
Unmarried	17	51.52	16	48.48		11	33.33	22	66.67	
Married	250	63.29	145	36.71		201	50.89	194	49.11	
Professional Characteristics										
Professional status					0.874					0.959
Contract worker	61	63.54	35	36.46		48	50.00	48	50.00	
Permanent driver	208	62.65	124	37.35		165	49.70	167	50.30	
Length of experience (Years)					0.124					0.000
Less than 5	104	57.14	78	42.86		67	36.81	115	63.19	
5 to 9	68	65.38	36	34.62		55	52.88	49	47.12	
10 and more	96	67.61	46	32.39		90	63.38	52	36.62	
Possession of a driver's licence					0.133					0.026
Yes	64	68.82	29	31.18		56	60.22	37	39.78	
No	197	60.24	130	39.76		154	47.09	173	52.91	
Background on RCs										
RC's witness experience					0.147					0.848
Yes	203	64.86	110	35.14		156	49.84	157	50.16	
No	64	57.14	48	42.86		57	50.89	55	49.11	
Experience as a victim of an RC					0.898					0.015
Yes	118	62.11	72	37.89		107	56.32	83	43.68	
No	148	62.71	88	37.29		105	44.49	131	55.51	

Abbreviation: RC, road crashes.

alerted the emergency services and 32.27% said they had helped the victims by a first-aid action. The proportion of PMs reporting alert or rescue practices was lower among PMs with less than 5 years of experience (Table 3). The main reasons given for the lack of initiative of practices at RCs were lack of knowledge to act (19.64%), fear of aggravating the situation (15.18%), and the fact that first-aid response was not part of the PM's remit (13.39%). The main reason for not raising

the alert was that the alert had already been given (12/22, 54.55%).

Concerning the overall level of practice, it was adequate for 149 PMs among the 313 who declared to have witnessed at least once a road crash, ie a proportion of 47.60. In multivariate analysis, the findings reveal a statistically significant association with educational level, professional seniority and previous experience as a CR victim (Table 5). Thus, after adjustment on the

Table 3 Act of Raising the Alert and First-Aid Practices Among PMs Witnessing AR (n=313), Cotonou, Bénin, 2019

Variables	Act of Raising the Alert					First-Aid Practices				
	Yes		No		p value	Yes		No		p value
	n	%	n	%		n	%	n	%	
Socio-demographic characteristics										
Age (years)					0.280					0.792
Less than 30	13	24.53	40	75.47		17	32.08	36	67.92	
30 to 44	61	34.08	118	65.92		55	30.73	124	69.27	
45 and more	29	37.66	48	62.34		27	35.06	50	64.94	
Level of education					0.082					0.100
Uneducated	24	25.26	71	74.74		23	24.21	72	75.79	
Primary school	44	40.00	66	60.00		42	38.18	68	61.82	
Secondary school at least	35	32.71	72	67.29		35	32.71	72	67.29	
Marital status					0.057					0.070
Unmarried	4	16.00	21	84.00		4	16.00	21	84.00	
Married	100	34.72	188	65.28		97	33.68	191	66.32	
Professional Characteristics										
Professional status					0.322					0.782
Contract worker	26	38.24	42	61.76		21	30.88	47	69.12	
Permanent driver	78	31.84	167	68.16		80	32.65	165	67.35	
Length of experience (Years)					0.002					0.047
Less than 5	29	22.48	100	77.52		32	24.81	97	75.19	
5 to 9	29	38.67	46	61.33		27	36.00	48	64.00	
10 and more	46	42.99	61	57.01		42	39.25	65	60.75	
Possession of a driver's licence					0.222					0.427
Yes	24	40.00	36	60.00		22	36.67	38	63.33	
No	79	31.73	170	68.27		78	31.33	171	68.67	
Background on RCs										
Experience as a victim of an RC					0.003					0.004
Yes	67	40.85	97	59.15		65	39.63	99	60.37	
No	37	25.00	111	75.00		36	24.32	112	75.68	

Abbreviation: RC, road crashes.

other variables in multivariate analysis, it appears that it was associated with education level with a higher probability of having an adequate level of overall practice among PM with primary education level (AOR: 2.61; CI 95%: 1.42–4.77) and those with minimum secondary education level (AOR: 1.90; CI 95%: 1.05–3.46) compared to uneducated PM. In the same trend, there is an association with professional seniority with a higher probability of having an adequate level of overall practice among PM with between 5 and 10 years of seniority (AOR: 2.16; CI 95%: 1.17–3.98) and among PM with at least 10 years of seniority (AOR: 1.83; CI 95%: 1.05–3.20) compared to PM exercising for less than 5 years. Moreover, the

previous experience of victim of RC is also associated with the level of practice (AOR: 2.37; CI 95%: 1.46–3.85)

Discussion

The purpose of this study was to describe the level of knowledge and practices regarding first-aid interventions among PMs in the city of Cotonou, as part of research to find innovative ways to strengthen the immediate post-crash chain in urban areas.^{1,29} The results showed a satisfactory knowledge of the legal framework, and a low level of knowledge of the means of raising the alert and of first-aid techniques. In addition, the level of overall knowledge was associated with the level of

Table 4 Level of Knowledge in First Aids and Associated Factors Among PMs, Benin, 2019: Univariate and Multivariate Analysis (n=430)

Variables	n	%	Model I					Final Model*			
			Crude OR			95% CI	p-value	AOR	95% CI	p-value	
			Adequate Level of Knowledge								
			Yes	%							
Socio-demographic characteristics											
Age (years)	426					0.032					
Less than 30	70	16.43		21.43	1.00		1.00				
30 to 44	244	57.28		36.48	2.11	1.12–3.94	1.34	0.66–2.76	0.419		
45 and more	112	26.29		38.39	2.29	1.15–4.54	1.30	0.57–2.94	0.590		
Level of education	428					0.000					
Uneducated	135	31.54		20.00	1.00		1.00			1.00	
Primary school	155	36.21		40.65	2.73	1.62–4.65	2.76	1.6–4.77	0.000	2.77	1.61–4.76
Secondary school at least	138	32.24		41.30	2.81	1.63–4.84	3.18	1.79–5.47	0.000	3.11	1.79–5.43
Marital status	428					0.003			0.06		
Married	395	92.29		36.20	1.00		1.00				
Unmarried	33	7.71		100.00	0.24	0.08–0.70	0.33	0.10–1.03			
Professional Characteristics											
Professional status	428					0.770					
Contract worker	96	22.43		33.33	1.00						
Permanent driver	332	77.57		34.94	1.07	0.66–1.74					
Length of experience (Years)	428					0.000					
Less than 5	182	42.52		24.18	1.00		1.00			1.00	
5 to 9	104	24.30		39.42	2.04	1.21–3.43	1.95	1.11–3.40	0.019	2.21	1.3–3.76
10 and more	142	33.18		43.66	2.43	1.51–3.90	1.99	1.15–3.43	0.014	2.56	1.58–4.18
Possession of a driver's licence	420					0.230			0.048		
No	327	77.86		33.03	1.00						
Yes	93	22.14		39.78	1.34	0.83–2.15					
Background on RCs											
RC's witness experience	425					0.999					
No	112	26.35		34.82	1.00	1.00					
Yes	313	73.65		34.82	1.00	0.64–1.57					

(Continued)

Table 4 (Continued).

Variables	n	%	Model I					Final Model*			
			Adequate Level of Knowledge			Crude OR	95% CI	p-value	AOR	95% CI	p-value
			n	%							
Experience as a victim of an RC	426										
	No	190	44.60	74	38.95						
	Yes	236	55.40	73	30.93	1.42	1.00 0.95–2.12	0.080	1.16	1.00 0.75–1.80	0.496

Note: *p value test of Hosmer and Lemeshow: 0.405.

Abbreviations: RC, road crashes; OR, odds ratio; AOR, adjusted odds ratio.

education, length of experience. The level of practice was also low and the main reasons given for non-practice were related to the level of knowledge of the course of action to take in an RC.

The socio-demographic characteristics of the PMs in the sample were similar to those found in a previous study on PMs conducted in Cotonou in 2016 and confirmed that the profession of PM concerns young, exclusively male subjects with, for the most part, long-standing professional experience of 5 years.³⁰ This profile should be an asset for ensuring the sustainability of interventions if PMs are integrated into the immediate post-crash management system, given the age of the subjects and their stability in employment. Stability is confirmed by the fact that, in this sample, more than 9 out of 10 PMs reported being permanent in the profession. In addition, about 7 out of 10 had already witnessed an RC; these figures were very close to those reported by authors in the Dominican Republic (68%) and confirm the key position of PMs in certain contexts as witnesses of RCs and as potential contributors in the management of RCs.³¹

As far as the level of knowledge is concerned, information on the existence of a legal duty to rescue was known by most of the PMs in the study; however, the emergency telephone numbers (police and fire service) were less well known, especially that of the police. The emergency line should be a freephone line, and if possible unique, with all the infrastructure necessary to ensure fluidity, because it was also shown that setting up a single emergency phone number could help reduce mortality related to RC.⁹ A real communication strategy should be deployed around it to ensure that it is as widely known as possible, as was the case in a study in India where 98.4% of the interviewed drivers knew the emergency services number.³² In our context, the police are still perceived as a source of repression, although the system implemented in the country as part of their intervention in RCs is coupled with that of the fire service, and this service is free. In addition, the populations are not sufficiently aware of these services (police and fire) and in particular their different financial and administrative implications, which can limit their use. The results of the study can therefore be explained by insufficient communication surrounding the activities of these different services in the event of RCs. The knowledge of first aid was also low in our study, which can be explained by the fact that it involves technical gestures that, although simple to learn, require some information or training. Very few PMs said

Table 5 Level of Practices in First Aids and Associated Factors Among PMs, Benin, 2019: Univariate and Multivariate Analysis (n=313)

Variables	n	%	Adequate Level of Practices			Crude OR	95% CI	p-value	Model I			Final Model*		
			Yes						AOR	95% CI	p-value	AOR	95% CI	p-value
				n	%									
Socio-demographic characteristics														
Age (years)	309													
	53	17.15		21	39.62	1.00		0.375						
	179	57.93		86	48.04	1.41	0.76–2.63							
	77	24.92		40	51.95	1.65	0.81–3.35							
Level of education	312							0.006						
	95	30.45		33	34.74	1.00			1.00			1.00		
	110	35.26		62	56.36	2.43	1.38–4.27		2.47	1.34–4.54	0.004	2.61	1.42–4.77	0.002
	107	34.29		53	49.53	1.84	1.05–3.26		1.87	1.01–3.45	0.044	1.90	1.05–3.46	0.034
Marital status	313							0.037						
	288	92.01		142	49.31	1.00			1.00					
	25	7.99		7	28.00	0.40	0.16–0.99		0.48	0.18–1.27				
Professional Characteristics														
Professional status	313							0.470						
	68	21.73		35	51.47	1.00								
	245	78.27		114	46.53	0.82	0.48–1.40							
Lenght of experience (Years)	311							0.001						
	129	41.48		46	35.66	1.00			1.00			1.00		
	75	24.12		42	56.00	2.30	1.28–4.10		2.18	1.17–4.06	0.014	2.16	1.17–3.98	0.014
	107	34.41		61	57.01	2.40	1.42–4.05		1.78	1.00–3.16	0.047	1.83	1.05–3.20	0.034
Possession of a driver's licence	309							0.130						
	249	80.58		114	45.78	1.00			1.00					
	60	19.42		34	56.67	1.54	0.88–2.73		1.36	0.75–2.50				
Background on RCs														
Experience as a victim of an RC	312							0.000						
	148	47.44		53	35.81	1.00			1.00			1.00		0.001
	164	52.56		96	58.54	2.53	1.60–4.00		2.23	1.37–3.66		2.37	1.46–3.85	0.001

Note: *p value test of Hosmer and Lemeshow: 0.9634.

Abbreviations: RC, road crashes; OR, odds ratio; AOR, adjusted odds ratio.

that they had received any information on the subject. This observation is very close to those made in the literature on this topic. For example, in the Dominican Republic, only 15.8% of PMs had received first-aid training.³¹ As regards practices, the level was low and the reasons given related to self-awareness of lack of skills in the matter. Nevertheless, the findings show an adequate level of practices (self-reported) among almost 50% of PMs who declared to have witnessed at least once a road crash. This indicates a certain willingness within the group to assist in case of RC. It was also noted that work experience, education, driver license and RC victim experience were factors in favor of a higher level of knowledge or practice. This is because these are all skill-building factors. The relationship between the level of education and the level of first-aid knowledge was confirmed by the works of the literature especially in Tanzania.¹⁰ Indeed, education improves access to information, while professional experience strengthens acquisition, and driver training provides specific information on road safety issues that also offers basic information on first aid. The role of training in the implementation of first-aid procedures in RCs has been demonstrated by the literature, not only as a factor for improving knowledge, but also as a trigger for practices in real-life situations.^{19,20,33,34} It is therefore relevant to envisage interventions aimed at strengthening the capacity of this target group, especially since almost all the interviewees expressed interest in this type of training, as was reported in the Dominican Republic, Nigeria and India.^{19,31,32} The efficiency of this type of intervention has been demonstrated and the experience is worth trying given the number of lives that could be potentially saved.³⁵

As far as previous experience as a victim of an RC is concerned, it probably makes the PM aware of the situation for having personally experienced it and makes him/her more empathetic, which probably explains the association found with the level of practice.

Limitations

The results of this study provide an initial idea of the status of first-aid knowledge and practices of PMs in the city of Cotonou. They are of interest in the analysis of the opportunity of the integration of this socio-professional group in the RC first-aid chain. The limitations, however, lie in the fact that the first-aid practices were self-reported and the study was unable to assess by observation the real level of practice of first-aid technical

procedures. A possible information bias, which may lead to a possible overestimation of the indicators, cannot be ruled out on this aspect. This does not, however, affect the conclusions for guiding strategic decisions.

Conclusion

This study showed that the level of knowledge and practices of PMs in first aid is low in the city of Cotonou. However, coherent and relevant avenues for the possible integration of this socio-professional group as a link in the first-aid chain in RCs were identified. These factors must be considered in the strategic analysis for improving the first-aid chain in RCs in Benin.

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Disclosure

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