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ORIGINAL ARTICLE

PROFILE OF LABOR AND ACCIDENTS IN THE OCCUPATIONAL ACTIVITY OF MOTORCYCLIST WORKERS

PERFIL DO TRABALHO E ACIDENTES NA ATIVIDADE OCUPACIONAL DE MOTOCICLISTAS PROFISSIONAIS

PERFIL DEL TRABAJO Y ACCIDENTES EN LA ACTIVIDAD OCUPACIONAL DE MOTOCICLISTAS PROFESIONALES

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ABSTRACT

Objective: to characterize the profile of motorcyclist workers, the working conditions and the occurrence of occupational accidents and illnesses. **Method:** a descriptive study with quantitative approach, performed in a town of Minas Gerais state, with 131 motorcyclist workers. During data collection, we used a questionnaire and the data were analyzed using SPSS software. The research had its project approved by the Research Ethics Committee, CAAE No. 0026.0.213.000-09. **Results:** 95.4% were men, 55.7% were between 21 and 30 years old, 45% had completed high school, 57.3% had already suffered accidents at work and only 1.5% used all personal protective equipment. **Conclusion:** the work of professional motorcyclists is performed in a precarious and risky manner, their working conditions favor the illness. Changes are suggested in legislation and monitoring in order to reduce informality and improve the social and health protection of this working class. **Descriptors:** Occupational Health; Work Accidents; Working conditions.

RESUMO

Objetivo: caracterizar o perfil dos motociclistas profissionais, as condições de trabalho, bem como a ocorrência de acidentes e adoecimentos laborais. **Método:** estudo descritivo, de abordagem quantitativa, realizado em uma cidade mineira, com 131 motociclistas profissionais. Na coleta de dados, utilizou-se um questionário e os dados foram analisados no software SPSS. A pesquisa teve aprovado o projeto pelo Comitê de Ética em Pesquisa, CAAE nº 0026.0.213.000-09. **Resultados:** 95,4% eram homens, 55,7% tinham de 21 a 30 anos, 45% com ensino médio completo, 57,3% já sofreram acidente de trabalho e somente 1,5% utilizavam todos os equipamentos de proteção individual. **Conclusão:** o trabalho dos *motoboys* é realizado de forma precária e repleto de riscos, suas condições de trabalho favorecem o adoecimento. Sugerem-se mudanças na legislação e na fiscalização no sentido de reduzir a informalidade, bem como melhorar a proteção social e sanitária desta classe trabalhadora. **Descritores:** Saúde do Trabalhador; Acidentes de Trabalho; Condições de Trabalho.

RESUMEN

Objetivo: caracterizar el perfil de los motociclistas profesionales, las condiciones de trabajo, así como la ocurrencia de accidentes y enfermedades laborales. **Método:** estudio descriptivo, de abordaje cuantitativo, realizado en una ciudad minera, con 131 motociclistas profesionales. La recolección de datos utilizó cuestionario y los datos analizados en el software SPSS. La investigación aprobó el proyecto por el Comité de Ética en Investigación, CAAE 0026.0.213.000-09. **Resultados:** 95,4% eran hombres, 55,7% tenían de 21 a 30 años, 45% con secundaria completa, 57,3 ya sufrieron accidentes de trabajo y solamente 1,5% utilizaban todos los equipamientos de protección individual. **Conclusión:** el trabajo de los *motoboys* es realizado de forma precaria y repleto de riesgos, sus condiciones de trabajo favorecen las enfermedades. Se sugieren cambios en la legislación y en la fiscalización con el sentido de reducir la informalidad, así como mejorar la protección social y sanitaria de ésta clase trabajadora. **Descriptores:** Salud del Trabajador; Accidentes de Trabajo; Condiciones de Trabajo.

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INTRODUCTION

The occupational risk agents can be of physical, chemical, biological and psychological types or anti-ergonomic situations that, together with the way work is organized, provide workers a risky, unsafe and unhealthy labor process. Depending on how it is implemented, with varying degrees of security and protection, with collective and/or individual equipment, sophisticated or rudimentary technology and greater or lesser intensity of rhythms, the work will wear individuals and weakening their health. The risks may be exacerbated and the effects of insecurity and unhealthy labor can change the condition of workers' healthiness, and promote them the occurrence of Occupational Accidents (OA), of diseases related to work or even loss of life.¹

As socially determined phenomena, OA are indicative of the intense exploitation that most of the workers is submitted, affecting mainly young adults and causing high number of cases of permanent disability and death.¹ In this context, it is significant the current growth of Brazilian motorcycles fleet, due to the low cost of acquisition, financing and maintenance of these, or for other reasons.² This increased motorcycle contingent contributes to the increase in the number of accidents involving motorcyclists, with various consequences for the worker and society: increased health and social security spending, absence from work, economic losses, among others.³

In addition to financial impacts, there is spending on health, since the proportion of injuries in motorcycle accidents is much higher than those due to other motor vehicles, perhaps because of the vulnerability of users of this type of vehicle.⁴ Thus, the current increasing in the fleet and the involvement of motorcyclists in accidents, especially in work activities, contribute to the illness of workers, causing a strong impact on morbidity and mortality, predominantly in young population.⁵

Given the above, the objective of this study is:

- To characterize the profile of professional motorcyclists, the working conditions and accidents and labor illnesses.

METHOD

The study took place in a city in Minas Gerais, with about 180,000 inhabitants, of whom about 97% live in the urban area. According to the municipal agency, there are 150 registered motorcycle taxi drivers and 102

couriers.⁹ Following the inclusion and exclusion criteria, 131 motorcyclists were interviewed.

For data collection, we used a structured questionnaire type instrument, tested and validated by experts.

The Guidelines and Rules of Research involving human subjects, issued in Resolution No. 466/12 of the National Health Council, were respected.⁶ The project was approved by the Research Ethics Committee of the *Pontifícia Católica* University of Minas Gerais (CAAE No 0026.0.213.000-09).

Individuals over 18 years old that, after being informed about the research, agreed to participate and signed the Informed Consent Form (ICF), were included in the study. We excluded those who did not agree to participate and under 18.

The following variables were considered: motorcycle courier is one that uses the motorcycle in the formal or informal labor market, especially in delivery services of goods and documents and mototaxi driver is a person that makes the transport of passengers.⁷

According to the social security legislation, Occupational Accident (OA) is the one that occurs in the course of work for a company or by performing work causing injury or functional disorder that causes death or loss or reduction, permanent or temporary, of the ability to work. It may be typical those occurring in the course of work activity or on the way to or from work, when it happens in the way from work to home or vice versa.⁸

The occupational disease is the one produced or triggered by exercise peculiar to a particular activity, while the work disease is acquired or triggered according to the specific conditions under which the work is done and it relates directly with it.¹ Professional and occupational diseases are considered as OA, according to the Social Security benefits law and are enrolled in a specific list.⁸

For the present study, we considered synonymous the mototaxi driver and the motorcycle courier, which were defined as professional motorcyclists, and the diseases were considered those referred by the employee and then compared with the rules to classify them as occupational, work or common diseases.

Data were organized in Excel spreadsheet and subsequently analyzed in Statistical Package for Social Sciences (SPSS), version 17.0. Continuous variables were described with mean and standard deviation and median/percentiles, and categorical variables with absolute and relative frequencies. For continuous variables, we carried out the

Kruskal-Wallis test to check the normal distribution of data. To verify the relationship between two categorical variables, we used Fisher's exact test, in which $p \leq 0.05$ was considered significant one.

RESULTS

The sociodemographic evaluation results are shown in Table 1.

Table 1. Distribution of professional motorcyclists of a town of Minas Gerais as to sociodemographic characteristics. Minas Gerais, 2013 (n=131).

Variables		Total	
		n	%
Gender	Male	125	95.4
	Female	6	4.6
	Total	131	100.0
Age group	21-30 years old	73	55.7
	31-40 years old	39	29.8
	41-50 years old	12	9.2
	Over 50 years old	7	5.3
	Total	131	100.0
Marital status	Single	49	37.4
	Married/Cohabiting	71	54.2
	Divorced	11	8.4
	Total	131	100.0
Educational status	Elementary School	45	34.4
	High School	76	58.0
	Higher Education	10	7.6
	Total	131	100.0
Family Income	1 to 2 Minimum Wages	3	2.3
	3 to 4 Minimum Wages	73	55.7
	5 to 6 Minimum Wages	17	13.0
	7 or more Minimum Wages	8	6.1
	Did not inform	30	22.9
	Total	131	100.0

Regarding gender, 125 (95.4%) were men, showing a predominance of males.

As to age group, 41 (31.3%) were aged between 21 and 30 years old. The mean age was 31 years of age, median 29 years old (8.57 years).

As to education, 76 (58%) reached high school, and 59 (45%) completed it; 10 (7.6%)

had higher education, but only two (1.5%) graduated.

It was found that the majority (55.7%) of respondents had a family income of three to four minimum wages. It was found also that 89 (67.9%) of respondents were heads of households, and 71 (54.2%) were married.

Table 2. Distribution of professional motorcyclists of a town of Minas Gerais as to job and social security data. Minas Gerais, 2013 (n=131).

Variables		Total	
		n	%
Time of driver's license to motorcycles	Less than 1 year	6	4.6
	Between 1 and 5 years	46	35.1
	Between 5 and 10 years	35	26.7
	More than 10 years	44	33.6
	Total	131	100.0
Employment and social security relationship	Informal/without registration	69	52.7
	Worker/individual contributor (self-employed)	50	38.2
	Registered employee	12	9.1
	Total	131	100.0

Regarding the time of driver's license, 44 (33.6%) motorcyclists said having it for more than 10 years.

Only 12 (9.1%) individuals are under contract and 50 (38.2%) contribute to social security as individual contributors (self-employed). The other 69 (52.7%) did not have any support (in case of accident) and any forecast for retirement.

Accordingly, 75 (57.2%) said they had worked without registration at Work Social Security in the period before the work as a motorcycle courier, showing the continuous nature of informality.

It was found that 23 (17.6%) of motorcyclists had other employment, increasing susceptibility to accidents due to work overload and extended hours.

Table 3. Distribution of professional motorcyclists of a town in Minas Gerais as to work and social security data. Minas Gerais, 2013 (n=131).

Variables			Total	
			n	%
Accidents at work		Yes, 1 to 5 accidents	67	51.1
		Yes, 6 to 10 accidents	6	4.6
		Yes, 10 to 15 accidents	2	1.5
		Had no accidents	56	42.8
		Total	131	100.0
Receiving aid / insurance after accident		Social security	11	8.4
		DPVAT (DMV Insurance)	1	0.8
		Did not receive	57	43.5
		Does not apply	56	42.7
		Did not answer	6	4.6
		Total	131	100.0
PPE used		Helmet, visor, gloves, shoes	80	61.0
		Helmet, visor, shoes	48	36.7
		Helmet, visor, kneepad and elbow pad, gloves and shoes	2	1.5
		Helmet and visor	1	0.8
		Total	131	100.0

Of the respondents, 75 (57.3%) had already experienced OA, 67 (51.1%) of these had experienced 1 to 5 OA, being 83.2% typical accidents (during activity) and 16.8% on the way to or from work (in itinere). Among those who experienced OA, most, 57 (43.5%), did not receive any financial aid from Social Security, because they were not covered by it.

Only two (1.5%) respondents used all PPE available (helmet, visor, kneepad, elbow pad, gloves and shoes). This can be explained by analyzing the Brazilian legislation, which

requires only helmet, visor and shoes, making 48 (36.6%) subjects use only these EPI.

Regarding the existence of a resting place, 111 (84.7%) respondents stated that, in their workplace, there is a space for this purpose. However, the researchers found that, although these areas exist, most of the time, they are inadequate, consisting of a chair or bench that motorcyclists use while waiting for the next ride.

We tried to analyze the correlation between OA and age (Table 4) and between OA and sleep (Table 5).

Table 4. Age comparison as to the number of accidents among professional motorcyclists of a town in Minas Gerais. Minas Gerais, 2013 (n=131).

Number of accidents	Mean	Standard deviation	Median	1st Quartile	3rd Quartile	Minimum	Maximum
0	31.8	8.9	29.5	24	37	20	54
1	31.0	8.7	29.5	24.5	34	20	54
2	29.9	9.4	29.5	21	35	20	51
3 or more	30.5	7.4	28	25	37	21	45

¥Value of p=0.8320(Kuskal-Wallis test).

We could not establish a connection between the age of the subjects and the number of accidents, considering that the mean age for accidents remained between 29.9 and 31.8 years old; however, victims of traffic accidents at work are aged from 26 to 30 years old.¹⁰

Table 5. Distribution of the number of accidents as to total daily working hours and sleep between professional motorcyclists of a town in Minas Gerais. Minas Gerais, 2013 (n=131).

	None		1		2		3 or more		Value of p*
	n	%	nf	%	n	%	n	%	
Hours worked per day									0.3448
4 to 8 hours	1	1.8	0	0	0	0.0	1	4.0	
8 to 12 hours	25	44.6	20	55.6	6	42.9	7	28.0	
More than 12 hours	30	53.6	16	44.4	8	57.1	17	68.0	
Hours of sleep per day									0.6353
8 hours or more	15	26.8	6	16.7	4	28.6	6	24.0	
6 to 8 hours	33	58.9	26	72.2	9	64.3	13	52.0	
Less than 6 hours	8	14.3	4	11.1	1	7.1	6	24.0	

* Fisher's exact test.

Statistics showed a correlation between the number of hours worked and the greater number of OA (p <0.5). All 129 (98.5%) subjects worked more than 8 hours per day.

The correlation between hours of sleep and the number of accidents could not be statistically confirmed in the present study.

DISCUSSION

The male predominance in this occupational category is attributed to increased exposure since men are often drivers of motor vehicles, have drivers' license and learn to drive with lower age.¹⁰⁻¹ This increased exposure and the resulting risks linked to the social and cultural patterns, determine high male mortality rates at the peak of their capacities, causing considerable economic losses,¹⁰ since the mean age was 31 years old. Other studies also show the predominance of young people in this occupation: 80% between 15 and 39 years old, especially, male.²

Literature has shown that, due to unemployment, as well as other factors, young people have joined in this occupational category. In Maringa (PR), it was identified the predominance of professional male motorcyclists, young and with experience less than ten years of qualification for motorcycle driving.¹⁰

In Los Angeles (USA), it was found that 86% of accidents involving motorcycles victimized young adults. However, the most serious occurred among subjects aged over 55 years of age. The most serious injuries, in skull, occurred among older subjects (13.8%), while for those aged 18 or less, the average lesions was 6.5%, 11 putting older drivers in a situation of greater severity of injuries.¹² On the other hand, young ones showed inexperience, lack of skill and ability, difficulty in perceiving the danger and solving problems, which can be a major factor to accidents at work.¹³

In addition to age, schooling is another important point in this profession. In a study conducted in the city of Teresina (Piauí), with motorcycle accident victims, it was found that 106 (35.22%) had incomplete secondary education.¹⁰ In another study, 54.8% of accident victims had completed between four and 11 years of schooling.¹⁴ In this sense, the lack of worker preparation plus the restructuring process of production culminates in the creation of new working arrangements, which are not always safe and healthy.

This context provides factors that may contribute to the exposure of workers, since most are heads of households and have an income of three to four minimum wages. In a study, 40% had a family income between two and four minimum wages, 67% of respondents were married and had children. This is a worrying fact, since most of the study subjects are family providers through a job that exposes them to various risks and does not often offer social insurance.¹⁰

Most have less than five years of qualification (drivers' license). Study in Paraná state found that the mean time of qualification among respondents was 6.78 years, and 42.10% had 1 to 10 years of driver's license.¹⁵ This is important because experience with automotive vehicles can provide greater ability to the work to be developed in traffic, because the lower the presented experience, the greater the difficulties in traffic and to stay in the position.⁷

In the current market, most motorcyclists are paid for production, earning less than the formal labor system. This may justify the behavior of these workers in traffic, that expose them to greater risk situations, a result of the payment model concerning them, added to the pressure exerted by customers for that deliveries are faster and faster.¹⁰

The payment for production, long working hours, alternating shifts are working conditions that can lead to risky situations.¹⁵

Excess working hours, in addition to other employment relationships, are serious aggravating to the already extensive occupational risks experienced by professional motorcyclists. This reality is a worrying fact for the workers' health and must be addressed through the creation of public policies.

Lack of formal registration in this category is predominant. Just as in the present study, in a research conducted in Londrina, 90.9% were unregistered. This situation makes them vulnerable, as the rights guaranteed by the social security labor legislation such as vacation, Christmas bonus, pension, unemployment and sick leave are not given to these workers.⁷

Lack of registration is a Brazilian reality, especially in socially disadvantaged professions. Law No. 12,009/09 aims to contribute to the improvement of these conditions, regulating the professional activities of passenger transport, such as mototaxi driver, delivery of goods and street community service, such as a motorcycle courier. This Law also provides for safety rules and regulation of this service.¹⁶ However, it has also generated little benefit for workers.

Study conducted in Bahia found that 76.77% of motorcyclists do not contribute to Social Security, so when victims of AO, they lack the social security benefits¹⁷, which the subjects surveyed could enjoy if inserted in the formal labor market, i.e., they would be entitled to coverage of disease, disability, death and old age effects.^{8,18} Multiplicity of injuries is common and 80% of subjects reported in a study having experienced more than one OA.¹⁰ OA are preventable facts and generate great impact to the economy, to society and to injured individuals.

According to Brazilian law, for formal workers, OA are reportable events, made through Work Accident Report (CAT in Portuguese). On the other hand, there is an Investigation Form whose filling feeds the Information System for Notifiable Diseases (SINAN in Portuguese) and is performed regardless of the labor relationship of the injured subject, whether the accident has occurred in the during work activity or in the way to or from work.¹⁹

There are different social security instruments: the Compulsory Notification List, according to the Decree No. 104/11, refers to diseases, injuries and important events to the national public health, whether in public or private health network, being reported and recorded in SINAN. CAT is a tool of great epidemiological importance and a source of information on OA, being a social security instrument.²⁰

Underreporting of OA by workers, health institutions and subjects prejudice the real statistics on OA, preventing the development of preventive actions. It is necessary awareness by health professionals, workers and society about the importance of compulsory notification of OA,¹⁹ both in CAT (formal workers) and in the SINAN (all workers).

Studies show that most of motorcyclists who suffered more than one accident, do not use other protective equipment other than the helmet. In this context, the regulation and the creation of laws that require the use of PPE and limit the working hours are recommended.^{10,21}

The issue of age is always controversial, but recent European study involving 19 countries aiming to investigate motorcyclists behavioral patterns identified that young ones are more likely to be involved in accidents.²²

In this study, it was possible to statistically demonstrate the correlation between the number of working hours and the largest number of OA suffered, confirming thus what other studies have shown on the influence of fatigue in accidents, since almost all motorcyclists worked more eight hour.²³

It should be noted that Article 58 of the Consolidation of Labor Laws (CLT) reads: "The normal hours of work, for employees in any private activity, shall not exceed eight hours, provided it is not explicitly set another limit".²⁴

The usual working hours of professional motorcyclists is 12 hours, which is a very long time and there is need to evaluate the impact of work requirements, which may foster the emergence of diseases, leading to an early functional aging.

It is worrisome the mental health of these individuals and the onset of diseases such as Burn Out Syndrome, characterized by the feeling of being exhausted, lack of energy and great emotional tension.²⁵⁻⁶

Study with 412 bus conductors and bus drivers in Natal (RN) found that the poor condition of roads, predatory competition, the intense working hours, the roads congestion and the precariousness of the vehicles are factors that contributed to the emergence of this disease, in which feelings of emotional exhaustion, depersonalization, and reduced personal accomplishment were identified.²⁵

Yet the correlation between the hours of sleep and the number of accidents occurred could not be confirmed statistically in the present study. However, French study that investigated whether the driving ability - measured by the efficiency of emergency maneuvers - was dependent on sleep

deprivation before and the time of day. Twelve male participants voluntarily participated in four test sessions at 6am, 10am, 2pm and 6pm after a night with or without sleep.

Each testing session comprised temperature and drowsiness measurements. Results indicated that controlling the motorcycle at low speed depends on the time of day, with improvement in performance throughout the day. Emergency braking performance has worse performance in the morning and also by sleep deprivation. It was concluded that the accident prevention capacity is affected by sleep deprivation and the time of day. Motorcyclists have to be aware that their manipulation skills are limited in the early morning and/or after sleep deprivation. Both situations can increase the risk of falls and of being involved in an accident.²⁷

CONCLUSION

Given the difficulties that are found in traffic currently, the activity of professional motorcyclist is critical to the cities services sector. Motorcycle allows that delivery services of small objects, documents and passenger transport are carried out faster and at lower costs, besides the smaller size of the motorcycle, which occupies less space in the already congested roads, however, it is necessary to analyze the situation beyond the benefits provided by this vehicle in labor activity of deliveries of objects and passenger transport. It is necessary to discuss the impacts from the adoption of these vehicles on a daily basis by these workers, especially in relation to traffic accidents, characterized now as OA, the exhausting working hours, the poor working conditions which they are subject and the flexibility of the employment contract, which provides total lack of protection before experienced OA.

The working and living conditions of motorcyclists provide many health risks, as well as accidents and illnesses. In this context, there is a correlation between the number of hours worked and the occurrence of OA; the payment for production, which causes the subjects to accelerate their pace, since salary depends on their productive capacity; the number of subjects working unregistered; as well as the OA situations experiences without the social security support.

Couriers know some of the risks they are exposed to, and know that accidents are constant in their professional practice, however, they do not always identify these accidents nor have their rights met. In

addition to occupational hazards, traffic, recklessness, lack of labor inspection and informality are conditions that further jeopardize the health and living conditions of these workers.

Changes are needed in legislation and especially in the labor and social security supervision to reduce informality and improve the social and health protection of this working class.

New studies with this profession are suggested in order to check the impact of the recent regulation of the profession in the working conditions of these subjects, to identify the OA occurrence profile and disease risk factors.

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