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Original Article

Association between self-reported cardiometabolic diseases, violence and drug use in truck drivers*

Associação entre doenças cardiometabólicas autorreferidas, violência e uso de drogas em caminhoneiros

Asociación entre enfermedades cardiometabólicas autoinformadas, violencia y consumo de drogas en conductores de camiones

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Abstract

Objective: to analyze the association between cadiometabolic diseases, violence and drug use in truck drivers. **Method:** cross-sectional study, that involved 235 truck drives that were in a gas station in the city of Uberlândia (MG), Brazil. Data were collected through self-reported interviews and the Chi-Square and Logistic Regression tests were applied, adopting a significance level of 0.05 for all variables. **Results**: there was a relationship between violent traffic events and some cardiometabolic diseases, especially peripheral vascular disease (OR=6.00 (95% CI 2.47-14.56) and obesity (OR=2.56 (CI 95% 1.42-4.62); and also, alcohol abuse (OR=4.16 (95% CI 1.53-11.29) and tobacco (OR=2.68 (95% CI 1, 10-6.51) were related to these pathologies. **Conclusion**: exposure to robberies and traffic accidents, and the use of alcohol and tobacco were associated with a greater chance of prevalence of cardiometabolic diseases among truck drivers.

Descriptors: Noncommunicable Diseases; Traffic-accidents; Disorders Related to Substance use; Violence; Occupational Health

Resumo

Objetivo: analisar a associação entre doenças cardiometabólicas, violência sofrida e uso de drogas em caminhoneiros. **Método:** estudo transversal que envolveu 235 motoristas que estiveram em um posto de combustível no município de Uberlândia (MG), Brasil. Os dados foram

coletados por meio de entrevistas autorrelatadas e aplicados os Testes de Qui Quadrado e Regressão Logística, adotando-se um nível de significância de 0,05 para todas as variáveis. **Resultados**: observou-se uma relação entre os eventos violentos no trânsito e algumas doenças cardiometabólicas, especialmente a doença vascular periférica (OR=6,00 (IC 95% 2,47-14,56) e a obesidade (OR=2,56 (IC 95% 1,42-4,62); sendo que também o abuso de álcool (OR=4,16 (IC 95% 1,53-11,29) e tabaco (OR=2,68 (IC 95% 1,10-6,51) se relacionaram com essas patologias. **Conclusão**: exposição a assaltos e acidentes de trânsito, e uso de álcool e tabaco foram associados a uma maior chance de prevalência das doenças cardiometabólicas entre caminhoneiros.
Descritores: Doenças Não Transmissíveis; Acidentes de Trânsito; Transtornos Relacionados ao Uso de Substâncias; Violência; Saúde do Trabalhador

Resumen

Objetivo: analizar la asociación entre enfermedades cardiometabólicas, violencia y consumo de drogas en camioneros. **Método**: estudio transversal, que involucró 235 camionetas que se encontraban en una gasolinera de la ciudad de Uberlândia (MG), Brasil. Los datos se recolectaron a través de entrevistas autoinformadas y se aplicaron las pruebas de Chi-Cuadrado y Regresión Logística, adoptando un nivel de significancia de 0.05 para todas las variables. **Resultados:** hubo relación entre eventos de tráfico violento y algunas enfermedades cardiometabólicas, especialmente enfermedad vascular periférica (OR = 6,00 (IC 95% 2,47-14,56) y obesidad (OR = 2,56 (IC 95% 1,42-4,62); y también, alcohol el abuso (OR = 4,16 (IC 95% 1,53-11,29) y el tabaco (OR = 2,68 (IC 95% 1, 10-6,51) se relacionaron con estas patologías**. Conclusión:** exposición a robos y accidentes de tráfico, y consumo de alcohol y el tabaco se asoció con una mayor probabilidad de prevalencia de enfermedades cardiometabólicas entre los conductores de camiones.
Descriptores: Enfermedades no Transmisibles; Accidentes de Tráfico; Trastornos Relacionados con el Uso de Sustancias; Violencia; Salud Laboral

Introduction

According to the World Health Organization (WHO), traffic accidents kill 1.3 million people worldwide annually, and the region of the Americas is responsible for 12% of these deaths; Brazil represents a quarter of these deaths in the region.[1] In 2018, 18,239 of these events were recorded on Brazilian federal highways, with the involvement of at least one truck, and, in the period from 2007 to 2018, 1,721,609 of these occurrences were recorded, of which approximately 33.1%, the equivalent to 38,040 deaths, involved at least one cargo transport vehicle.[2]

Another external condition that has been gaining dimensions of the public health issue is exposion to labor violence which truck drivers are subjected to. These professionals are up to seven times more likely to die at work and are twice as likely to suffer an injury than other work profiles. They are more susceptible to workplace violence because they handle goods, work alone, and work non-standard hours. A

common form of violence is criminal circumstances to which the driver is exposed, may be assaulted, assault, verbally abused or killed.[3]

In Brazil, in 2018, 22,183 robberies and cargo theft were recorded, of which 22% of the robberies took place on highways.[2] Thus, it is no coincidence that in a survey carried out with 1066 Brazilian truck drivers in 2019, 65.1% of respondents considered the fact that the activity was dangerous/unsafe as a negative point in the profession; 7% had their vehicle stolen at least once in the last two years; 49.5% of professionals had already refused trips due to the risk of robbery/robbery during the journey, and 64.6% of truck drivers considered robberies and robberies as the main obstacle to the profession.[4]

History and imminent danger of trauma and violence in traffic situations - robbery and/or robbery accidents - exposes the driver to a direct risk of developing mental disorders, especially of the anxious and depressive types, degradation of the quality of life, as well as use of psychoactive drugs.[3, 5-6]

In addition to these problems, truck drivers face other challenges related to their physical health, such as a stressful work routine, high daily workload, long stretches, many days away from home, contributing factors for these professionals to suffer from sedentary lifestyles, irregular and inappropriate eating habits, overweight, smoking, alcoholism and use of psychoactive drugs.[1-7] All these situations contribute to a higher incidence of development of cardiometabolic diseases among these professionals when compared to the general population.[8-11]

Scientific evidence[12-15] has suggested that psychological states can influence physical health as a risk fator of cardiovascular and metabolic diseases, however, subjacent mechanisms of cause and effect are not well established. Potentially traumatic events that cause anxiety and depressive states - such as traffic accidents and situations of violence - may be related to a series of diseases of this profile.[7,16-18]

However, studies that assess the relationship between traffic violence, drug use and physical conditions, specifically among professional truck drivers, are infrequent in the literature. Such investigations are important for expanding the scope of actions and measures to promote the health of this worker. The aim of the present study was to analyze the association between cardiometabolic diseases, suffered violence and drug use in truck drivers.

Method

Cross-sectional study with 235 truck drivers who traveled along federal highways in the region of the municipality of Uberlândia, Minas Gerais (MG), Brazil. The city has 683,247 thousand inhabitants, is located in the region called Triângulo Mineiro and has a strategic position in the country, as it is crossed by federal highways of great importance, connecting with the main Brazilian capitals. Data collection took place between July and November 2018.

Inclusion criteria for the study were: self-declared a professional truck driver, being over 18 years old, having been working for more than one year; 5 truck drivers were excluded from the survey, 3 for having less than a year of work, and 2 who withdrew from participating for personal reasons, even after having answered part of the data collection instrument.

To define the sample size, a previous survey of information was carried out, through reports by managers of truck stop stations about the minimum flow of drivers who passed these establishments, thus having a population of around 600 individuals who stopped at these locations for month. For purposes of sample calculation of the research, a representativeness of the population to be studied was considered, considering a confidence level of 95% and a margin of error of 5% ($p>0.05$) for more or less, stipulated for convenience.

The minimum expected sample number was 227 and maximum 250 participants. The proposed research was carried out at a gas station on the federal road network that intersects the municipality of Uberlândia, together with professional truck drivers who, at that time, were in the area. The drivers were approached by a team of researchers made up of graduate and postgraduate students in the health area, duly trained, on alternate days of the week, from Monday to Friday, from 7:00 pm to 9:00 pm.

Location chosen for data collection for the study was a convenience/stop/fuel station located on the side of a highway that has a large flow of truck drivers who use it as a place to stay overnight. Drivers were invited to participate in the welcoming tent, in which nursing professionals were available to measure blood pressure, weight, height and waist circumference. During the service, they were informed about the possibility of

participating in the research and informed about the objectives of the study. In view of the manifest of interest in participating, they were asked to sign the Informed Consent Term in accordance with Resolution 466/12 of the National Health Council. Those who agreed to participate were interviewed by the researcher through the instrument for collecting data.

The information contained in this instrument that served to analyze the present study were self-reported data from a script with closed questions containing: a-) Sociodemographic information (age, sex, color, marital status, religion); b-) Professional information (number of hours worked per week, number of accidents suffered in the last year with and without victims, number of robberies suffered in the last year); c-) Presence or not of self-reported cardiometabolic diseases; [19-20] d-) To assess the use of psychotropic drugs, the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) was applied, which measures the level of dependence and contains eight questions, the first seven referring to the use and problems related to tobacco and alcohol , marijuana, cocaine, stimulants, inhalants, hypnotics/sedatives, hallucinogens and opiates; the last issue is related to injecting drugs. The score, which ranges from 0 to 8, with the total sum ranging from 0 to 39.

Answer options for question one are: yes/no; for questions 2 to 5 the possible answers are: never/1 or twice/monthly/weekly/daily or almost every day; for questions 6 and 7, the possible answers are: no, never/yes, in the last three months/yes, but not in the last three months, and for question 8, the possible answers are yes/no.

Scores obtained in the ASSIST results suggest interventions according to the analysis of the consumption of each individual. Scores lower than 3 (or 10, in the case of alcohol) identify that the person is at low risk of having problems related to drug use; mean score between 4 (or 11 for alcohol) and 26 are indicative of harmful or problematic drug use; a score above 27 for any substance suggests that the person is at high risk for addiction.[21]

The study's independent variables were: a-) having suffered a traffic accident, b-) having been robbed, and c-) having abused alcohol or tobacco. The outcome variables were the occurrence of suffering from one or more cardiometabolic diseases (self-reported), such as: diabetes mellitus, systemic arterial hypertension, obesity, peripheral

vascular disease, dyslipidemias, stroke, chronic obstructive pulmonary disease/bronchitis, nephropathy, failure congestive heart disease, acute myocardial infarction, valvulopathies. These variables were selected to compose the multivariate regression model because they are the most common cardiometabolic diseases found in the adult Brazilian population.[19-20]

Data analysis was performed through the development of a database in the Statistical Program of Social Science (SPSS) version 20, for Windows, through double typing, seeking to eliminate errors and inconsistencies. Data were considered asymmetric using the Shapiro-Wilk normality test; descriptive analyzes were performed by calculating means, percentages of variables, minimum values, maximum values and standard deviations; and bivariate analysis of data, using Spearman's rank correlation coefficient test, Chi-square test.

Crude and adjusted data analysis was performed, and the variables obtained a $p>0.20$ in the bivariate analysis and were included in the multivariate logistic regression model. The magnitude of the association between the explanatory variables and outcome, with dichotomous responses, was estimated using the Odds Ratio (OR) with a 95% confidence interval (95%CI). The level of significance (p value) was set at 0.05 for all variables. The project was approved by the National Research Ethics Committee, by the Research Ethics Committee of the Federal University of Uberlândia - MG, Brazil, protocol 2.429.169, on 12/11/2017.

Results

Of the 235 truck drivers, all were male, with a higher prevalence of self-declared whites (43.4%), married (69.8%), traveling around 3,133 kilometers a day in 12 hours and 31 minutes during the same period. As for involvement in traffic accidents in the last year, 69 (29.4%) responded positively, and 75 (31.9%) of the drivers reported having been assaulted in the last year.

Regarding drug use, in the last three months, the participants had weekly use of: alcoholic beverages (16.2%), tobacco (13.2%); marijuana (1.3%), amphetamines or stimulants (2.1%) (Table 1).

Table 1 – Level of use of psychoactive drugs according to the results of the ASSIST Test for user drivers. Uberlândia-MG, 2018 (n=235).

Variable	n	%
Tabacco		
Low risk use	189	81,5
Abusive use	39	16,8
Probable dependence	4	1,7
Did not answer the question	3	
Alcohol		
Low risk use	214	91,1
Abusive use	12	5,1
Probable dependence	9	3,8
Marihuana		
Low risk use	228	98,7
Abusive use	3	1,3
Probable dependence	-	-
Did not answer the question	4	-
Coccaine		
Low risk use	228	97,9
Abusive use	2	0,9
Probable dependence	3	1,3
Did not answer the question	2	
Amphetamine		
Low risk use	221	94,8
Abusive use	12	5,2
Probable dependence	-	-
Did not answer the question	2	

The most prevalent self-reported cardiometabolic diseases were obesity (28.9%) and systemic arterial hypertension (21.7%). 06 participants (2.6%) reported having a acute myocardial infarction and 1 (0.4%) suffered a stroke. (Table 2).

Table 2 - Self-reported cardiometabolic diseases by truck drivers Uberlândia-MG, 2018 (n=235).

Variable	n	%
Diabetes mellitus	25	10,6
Systemic Arterial Hypertension	51	21,7
Obesity	68	28,9
Peripheral vascular disease	26	11,1
Dyslipidemias	18	7,7
Brain stroke	1	0,4
Chronic Obstructive Pulmonary Disease/Bronchitis	10	4,3
Nephropathy	14	6,0
Congestive heart failure	5	2,1
Acute myocardial infarction	6	2,6
Valvulopathies	4	1,7

In the logistic regression analysis, heavy tobacco consumption more than doubled the odds for the prevalence of peripheral vascular disease (OR=2.68 (95% CI 1.10-6.51) p=0.002); alcohol abuse also increases by more than four times the prevalence of chances for peripheral vascular disease (OR=4.16 (95% CI 1.53-11.29) p=0.005).

Table 3 - Logistic regression between alcohol and tobacco abuse and self-reported cardiometabolic diseases by truck drivers (n=235). Uberlândia, Minas Gerais, Brazil.

	Tabacco								Alcohol							
	No		Yes						No		Yes					
Disease	n	%	n	%	OR	p value	IC (95%)		n	%	n	%	OR	P value	IC (95%)	
Diabetes *Melittus*	25	13,2	-	-	1,00	0,98	-	-	25	11,8	0	-	1,00	0,98	-	-
Hypertension Systemic Arterial	49	25,9	1	2,3	0,07	0,00	0,01	0,51	49	23,2	2	8,3	0,30	0,11	-	1,3
Obesity	57	30,1	8	18,6	0,53	0,13	0,23	1,21	64	30,3	4	16,6	0,46	0,17	0,1	1,4
Peripheral Vascular Disease	17	8,9	9	20,9	2,68	0,02	1,10	6,51	19	9,0	7	29,1	4,16	0,00	1,5	11,2
Dyslipidemias	18	9,5	0	-	1,00	0,98	-	-	17	8,0	1	4,1	0,50	0,50	-	3,0
Brain Stroke	-	-	1	2,3	1,00	0,98	-	-	-	-	1	4,1	1,00	0,99	-	-
COPD Bronchitis	9	4,7	1	2,3	0,48	0,48	0,06	3,86	10	4,7	-	-	1,00	0,99	-	-
Nephropathy	14	7,4	-	-	1,00	0,98	-	-	13	6,1	1	4,1	0,66	0,69	-	5,3
Congestive Heart Failure	5	2,6	-	-	1,00	0,98	-	-	5	2,3	-	-	1,00	0,98	-	-
Acute Myocardial Infarction	6	3,1	-	-	1,00	0,98	-	-	6	2,8	-	-	1,00	0,98	-	-
Valvulopathies	4	2,1	-	-	1,00	0,99	-	-	4	1,9	-	-	1,00	0,99	-	-

Other drugs were not included in the logistic regression analysis because they had no statistically significant association (p<0.05) with diseases according to the chi-square test.

As for the history of accidents and robberies, the logistic regression analysis showed that having had accidents in the last year increases the chances for the self-reported prevalence of peripheral vascular disease among drivers (OR=3.91 (95% CI 1.69-9) .05), p=0.0014). Regarding the fact of having been robbed, the chances for the occurrence of peripheral vascular disease increases by six times (OR=6.00 (95% CI 2.47-14.56) p=0.0001), more than twice the odds for obesity (OR=2.56 (95% CI 1.42-4.62) p=0.0017) and more than four times the odds for kidney disease (OR=4.23 (95% CI 1.36) -13.09) p=0.0124). (Table 4).

Table 4 - Logistic regression between having a history of accidents and assaults, and cardiometabolic diseases self-reported by truck drivers (n=235). Uberlândia, Minas Gerais, Brazil.

	Accidents								Assaults							
	No		Yes						No		Yes					
Disease	n	%	n	%	OR	P value	IC (95%)		n	%	n	%	OR	P value	IC (95%)	
Diabetes *Melittus*	62	29,5	7	28,0	0,93	0,87	0,37	0,87	63	30,00	12	48,0	2,15	0,07	0,93	4,98
Systemic Arterial Hypertension	55	29,8	14	27,4	0,89	0,73	0,44	0,73	58	31,5	17	33,3	1,09	0,80	0,56	2,10
Obesity	46	27,5	23	33,8	1,34	0,33	0,73	0,33	43	25,7	32	47,0	2,56	0,00	1,42	4,62
Peripheral Vascular Disease	54	25,8	15	57,6	3,91	0,00	1,69	0,00	57	27,2	18	69,2	6,00	0,00	2,47	14,56
Dyslipidemias	60	27,6	9	50,0	2,62	0,05	0,99	0,05	67	30,8	8	44,4	1,79	0,24	0,68	4,74
Brain Stroke	68	29,0	1	100,0	1,00	0,99	-	0,99	75	32,0	-	-	1,00	0,99	-	-
COPD/Bronchitis	64	28,4	5	50,0	2,52	0,15	0,70	0,15	71	31,5	4	40,0	1,45	0,57	0,40	5,28
Nephropathy	64	28,9	5	35,7	1,36	0,59	0,44	0,59	66	29,8	9	64,2	4,23	0,01	1,36	13,09
Congestive Heart Failure	66	28,7	3	60,0	3,73	0,15	0,61	0,15	71	30,8	4	80,0	8,96	0,05	0,98	81,58
Acute Myocardial Infarction	63	27,5	6	100,0	1,00	0,99	-	0,99	72	31,4	3	50,0	2,18	0,34	0,43	11,07
Valvulopathies	66	28,5	3	75,0	7,50	0,08	0,77	0,08	75	32,4	-	-	1,00	0,99	-	-

Discussion

Among the surveyed cardiometabolic diseases, peripheral vascular disease (PVD) stood out for being associated with both the self-reported prevalence of accidents and robberies in the latter, as well as the abusive use of tobacco and alcohol by truck drivers. In general, the sociodemographic profile of truck drivers: male, white, Catholic, married; works more than 10 hours a day is similar to a study by the National Transport Confederation.[4]

DVP was the cardiometabolic disease most associated with the abuse of alcohol and tobacco, as well as the history of accidents and assaults suffered by drivers. DVP also known as Peripheral Obstructive Arterial Disease[22] (DAOP) is a manifestation of atherosclerosis, a vascular disease that is often underdiagnosed; the main symptoms are intermittent claudication, occurrence of pain in the legs, fatigue triggered by walking and relieved by rest; among the main etiologies for PVD are smoking, obesity, diabetes mellitus, arterial hypertension and dyslipidemia.[22-23] The fact that drivers are seated almost all the time, in the same position,[24] contributing to the sedentary lifestyle and the worsening of the disease.

Regarding the higher prevalence of VPD associated with other health factors studied, it is important to consider that it is not possible to establish an interpretation of the cause-and-effect relationship according to the cross-sectional design of the present investigation, however, in an attempt to discuss some possibilities to expand the understanding of this data, it is credible to weave some possibilities of the occurrence of the study results among truck drivers.

The presence of DVP related to tobacco and alcohol use appears in other studies.[22-23] In addition, the use of legal or illegal psychoactive drugs is already a complicating factor for the health of truck drivers and traffic safety, increasing the chances of fatal accidents,[24-25] as well as inappropriate and dangerous attitudes on the part of drivers.[7] The effects of alcohol, tobacco and other psychoactive drugs on the body cause important changes in the functioning of the Central Nervous System, especially with regard to cognition, attention, memory, concentration and reflex; all of this directly interferes with drivers' ability to drive safely.[1,7,24-26]

It is also worth considering that the abuse of tobacco, alcohol and other drugs has a high prevalence among people with post-traumatic disorders, whose exposure to violence is one of the main triggering factors,[6,11] therefore, drivers who reported experiencing an assault or accident event in the last year may be included in this category.

Obesity was the pathology pointed out by this research as being the most prevalent among truck drivers (29%), and is related to accidents and robberies. The high prevalence of obesity in truck drivers has been identified in other studies, often as a result of sedentary lifestyle and poor eating habits, often linked to factors such as low self-efficacy, negative attitudes towards eating health, peer pressure, motivation, food addiction, access to unhealthy snacks, trends in food supply, advertising, value of meals and emotional distress.[4, 25, 27]

In this last aspect – emotional suffering – related to obesity, its association with accidents and assaults can be one of the different ways to be understood. A meta-analysis identified that people with symptoms of post-traumatic disorders (as may be the case with the stress generated by the experience of violence) are more likely to exercise less, be obese and smokers.[28] The driver involved in this process may have a greatly increased risk for the development of cardiovascular diseases, diabetes mellitus, hypertension and other pathologies,10 a fact that further aggravates the potential health risks of these workers.

Other cardiocirculatory diseases (in addition to nephropathy and dyslipidemia) have been associated with a history of road accidents and robberies. Similar results can be found in other studies that studied the relationship between stress (which can be caused by exposure to these accidents and assaults, for example) and cardiovascular risk,[29] sometimes being explained by biological factors (eg, metabolic syndrome, increased pro-inflammatory drugs and hormonal changes), psychological factors (personality traits), behavioral factors (unhealthy lifestyle).[30]

Limitations of this research should be considered. The use of self-reports can create bias in responses due to possible constraints generated and difficulty in understanding the definition of pathologies (for example, obesity); it is also necessary to highlight the importance of new studies with diversified methodologies, both with a qualitative approach (to understand the whole phenomenon) and with a longitudinal quantitative approach (in order to establish the cause and effect relationship).

In this same sense of understanding, the relationship between PVD and psychosocial stress at work was identified in a study with 139 hospitalized patients in Denmark,[26] being a small but consistent marker for increased risk of hospitalization in people with the disease. Therefore, since high demands for work stress on drivers have already been identified[1,7] having traffic violence (accidents and robberies) as one of its main causes,[3-4] it seems coherent to relate this context to increased exposure to DVP.

However, the contributions of the study must be considered, since researches that directly assess the chances of exposure to traffic violence in the health of truck drivers have not yet been found in the national literature on workers' health. The results can collaborate with the expansion of the look at the health care needs of professionals who are already so vulnerable due to the nature of their work, with the expansion of the scope of health policies, programs and actions aimed at this population, in addition to pointing to the need from other discussions with the same theme. The implications of the study for nursing are in the possibilities of offering subsidies for the development of care strategies specifically aimed at these workers that involve the inseparability of work, socio-emotional and physical characteristics.

Conclusion

Self-reported history of robberies and traffic accidents, as well as the consumption of alcohol and tobacco, were associated with a greater chance of prevalence of some cardiometabolic diseases, peripheral vascular disease, among truck drivers. The issue of traffic violence can present a greater capillarity in the health conditions of freight transport drivers that go beyond emotional or psychological impacts. Thus, public health policies need to recognize violence related to the work of truck drivers as a risk factor for cardiovascular and metabolic disease outcomes.

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