LABOR CHARACTERISTICS ASSOCIATED WITH HIGH BLOOD PRESSURE AMONG TRUCK DRIVERS

CARACTERÍSTICAS LABORAIS ASSOCIADAS À PRESSÃO ARTERIAL ELEVADA ENTRE CAMINHONEIROS

CARACTERÍSTICAS LABORALES ASOCIADAS A LA HIPERTENSIÓN ARTERIAL ENTRE LOS CAMIONEROS

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ABSTRACT
Objective: To evaluate the prevalence of high blood pressure among truck drivers and its association with job characteristics. **Methods**: data collection performed using a semi-structured instrument, developed by the researchers, with questions about sociodemographic variables, life habits, work, and clinical. Blood pressure (BP) was measured, in addition to the measurement of body weight and height. Truck drivers with a medical history of high blood pressure were not included. **Results**: 184 truck drivers with a mean age (± SD) of 41.3 (± 10.2) years were included; the majority covered at least 3,000 km per week (58.7%) and drove for more than 10 hours daily (63.0%). Elevated BP was verified in 73 (39.6%) participants. Through the analysis of the adjusted Odds ratio, it was found that among truck drivers who traveled 3000km or more per week (n = 76, 41.3%) the chance of high BP was 2.3 times greater compared to the group who rode less than 3000 km per week (p <0.05). **Conclusion**: The greater distance traveled by truck drivers increased about twice the chance of this professional having his BP increased.
Descriptors: Worker's health; Blood pressure; Risk factors

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RESUMO

Objetivo: Avaliar a prevalência de pressão arterial elevada entre caminhoneiros e sua associação a características laborais. **Métodos**: coleta de dados realizada por meio de instrumento semi estruturado, com questões sobre variáveis sociodemográficas, hábitos de vida, laborais, e clínicos. Não foram incluídos caminhoneiros com história clínica de hipertensão arterial. **Resultados:** 184 caminhoneiros com idade média (±DP) de 41,3 (±10,2) anos; a maioria percorria ao menos 3.000 km por semana (58,7%) e dirigia por mais de 10 horas diariamente (63,0 %). PA elevada foi verificada em 73 (39,6%) participantes. Mediante a análise da *Odds ratio* ajustado, verificou-se que entre os caminhoneiros que rodavam 3000km ou mais por semana (n=76, 41,3%) a chance de PA elevada era 2,3 vezes maior comparado ao grupo que rodava menos de 3000Km por semana (p<0,05). **Conclusão**: A maior distância percorrida pelos caminhoneiros aumentou cerca de duas vezes a chance desse profissional ter sua PA elevada.
Descritores: Saúde do trabalhador; Pressão arterial; Fatores de risco.

RESUMEN
Objetivo: Evaluar la prevalencia de hipertensión arterial en los camioneros y su asociación con las características laborales. **Métodos:** recolección de datos realizada mediante un instrumento semiestructurado, desarrollado por los investigadores, con preguntas sobre variables sociodemográficas, hábitos de vida, laborales y clínicos. Se midieron la presión arterial (PA), el peso corporal y la altura. No fueron incluidos los camioneros con antecedentes médicos de hipertensión arterial. **Resultados:** se incluyeron 184 camioneros con una edad media (± DE) de 41,3 (± 10,2) años; la mayoría recorría al menos 3.000 km por semana (58,7%) y conducía más de 10 horas diarias (63,0%). Se detectó PA elevada en 73 (39,6%) participantes. Mediante el análisis de la razón de probabilidades ajustada, se observó que los camioneros que viajaban más de 3000 km por semana (n = 76, 41,3%) tenían 2,3 veces más probabilidades de desarrollar PA elevada que los que viajaban menos de 3000 km por semana (p <0,05). **Conclusión:** Un aumento en la distancia que recorren los camioneros aumentó aproximadamente el doble las posibilidades de que la PA de los mismos subiera.
Descriptores: Salud del trabajador; Presión arterial; Factores de riesgo.

INTRODUCTION

Chronic non-communicable diseases (NCDs) – arterial hypertension (AH), respiratory diseases, cancer and diabetes – represent an important cause of morbidity and mortality in the world. Annually, 36 million people die from NCDs, corresponding to 63% of global deaths. Of the total number of deaths/year, cardiovascular diseases (CVD) are responsible for 17 million cases. In Brazil, in 2015, 1,264,175 deaths were recorded, 7.1% due to acute myocardial infarction, 3.7% hypertensive diseases and 1.7% ischemic heart diseases. Among the risk factors for CVD are: hypercholesterolemia, physical inactivity, male gender, heredity, overweight, obesity, age, diabetes mellitus, tobacco, alcohol and Arterial Hypertension (AH).[1-2] Among such factors, AH stands out as the main risk factor related to the

occurrence and severity of cardiovascular diseases.[3]

AH is a multifactorial clinical condition characterized by sustained elevation of blood pressure levels systolic blood pressure (SBP) $\geq$ 140 and/or diastolic blood pressure (DBP) $\geq$ 90 mmHg (5). According to data from the World Health Organization (WHO), approximately 7.1 million deaths from CVD occurred in 2015, and it is estimated that, in 2025, approximately 600 million people will have AH, with a global growth of 60% of the cases.[4]

According to the publication by Araújo[5], what further aggravates the incidence and prevalence of this disease is the aging of the population, increasing urbanization and the adoption of unhealthy lifestyles, such as physical inactivity, inadequate diet, obesity and smoking. According to Ulguim[6], it is believed that the work environment has a decisive influence on health as a possible cause of psycho-emotional stress, increasing the risk of developing cardiovascular diseases. The truck driver profession may be related to several risk factors for cardiovascular diseases. The population of truck drivers is vulnerable in relation to AH, due to the lifestyles that they adapt to. As a result, this group harms their health status due to setbacks and obstacles in living a healthy lifestyle.[7]

In Brazil, the number of truck fleets is around 2,684,041 and truck drivers represent a significant percentage for the growth of the Brazilian economy, as the person responsible for 58% of the goods that circulate in the country is the transport of cargo.[7-8]

The characteristics of the work present in this group of workers, such as the exhausting daily routine, lack of leisure time and days off, absence of predetermined work hours, risky lifestyle such as, for example: the use of psychoactive substances, poor diet, long working hours, poor sleep quality, sedentary lifestyle, alcohol use, smoking, stress and excess fat, favor the installation of multiple risk factors for AH.[9-10]

Considering the human, social and economic contingents involved in cargo transport in Brazil, epidemiological studies on the health conditions of Brazilian cargo drivers, especially those involving risk factors for AH, are of imperative importance because they contribute to dimension the magnitude of the challenge to be faced intersectorally to promote health prevention actions and policies aimed at this portion of workers.

Therefore, knowledge and control of risk factors are essential to reduce the occurrence of AH. From this context, this study has as its guiding question: What is the prevalence of high blood pressure

among truck drivers and its association with work characteristics?

Thus, the general objective of the research was to identify changes in blood pressure in truck drivers and to verify the association with the work variables of these professionals.

MATERIALS AND METHOD

This is a descriptive, exploratory study, with a quantitative approach, whose population was formed by truck drivers who traveled on the federal road network in the city of Uberlândia, Minas Gerais, Brazil. The sample was calculated using a representativeness of this population and a confidence level of 95% and a margin of error of 5% more or less were considered.

The inclusion criterion was to work as a cargo truck driver. The exclusion criterion was having less than one year in the profession and/or reporting being hypertensive.

Drivers were invited to participate in the study when they made stops to rest, refuel and/or eat at a gas station. Participants were invited to answer the questionnaire and undergo anthropometric tests after consenting to participate in the study, by signing the informed consent, in accordance with Resolution 466/12 of the National Health Council, approved by the Research Ethics Committee of the University Federal de Uberlândia with the

opinion number: 2,429,169. Data collection took place between January and September 2018, in a space at the gas station, as authorized by the person responsible for the establishment. This study was funded for one year by the National Council for Scientific and Technological Development - CNPQ.

Study variables

Data were obtained in two ways. The first was through a semi-structured instrument, prepared by the researchers, composed of questions referring to sociodemographic data (age, sex and self-reported skin color), work (time driving as the main occupation, distance driven per week in kilometers, number of days worked outside the home between trips, type of vehicle), life habits (practice of physical activity, smoking, alcohol consumption), and clinical (previous medical diagnosis of arterial hypertension, diabetes and other diseases). The second proceeded with BP measurement, in addition to measuring body weight and height.

The determination of BP followed the recommendations of the VI Brazilian Guidelines on Hypertension.[20] The Brachial Circumference (BC) was measured in order to select the appropriate size cuff for the participant's arm. Three BP measurements were taken with an interval of 60 seconds

between procedures, considering the average of the last 2 values obtained.

The criterion for the altered BP definition was the SBP value ≥ 140 mmHg and/or DBP ≥ 90 mmHg[20] and for previous AH, the research participant's self-report.

Data analysis

Data were recorded in double Excel® worksheets and validation was subsequently performed. Descriptive analysis of simple distribution of data and presented by percentages was used. To analyze the association between the outcome (altered BP) and work variables, we first performed univariate analysis using Pearson's Chi-Square test. The Odds Ratio (OD) was calculated, with their respective 95% confidence intervals for each study variable. Subsequently, to adjust the logistic regression model, the independent variables related to the dependent variable were considered. To test the input or output of the variable in the model, the Likelihood Ratio test was used. From the adjusted model, the Odds Ratio (Adjusted) and the probability of prediction of the model were calculated.

The significance level adopted was α=0.05. The SPSS Windows Statistical Package for the Social Science (SPSS) program, version 22.0, was used.

RESULTS

The sample consisted of 184 truck drivers, all male with a mean (±SD) age of 41.3 (±10.2) years, the majority between 36 and 59 years old (n=124, 67.4%) and sedentary (n=152, 82.6%). Alcoholism was identified in half of the participants (n=92, 50.0%) and smoking in 23.9% (n=44). Obesity in 31.5% and previous diseases in only 4.3% of cases.

When considering BP values, 73 (39.6%) participants had SBP ≥ 140 mmHg and/or DBP ≥ 90 mmHg (Table 1). Among the sociodemographic factors, lifestyle and clinical habits, smoking (p=0.009), diabetes (p=0.037) and age (p=0.005) were associated with altered BP values.

Note that a greater distance (≥3000 km) driven by the truck driver for a week, increased the chance of changing the BP 2.32 times more compared to those driving less than 3000 km (Table 2).

Table 1- Distribution of truck drivers (n=184) according to work characteristics by blood pressure values. Uberlândia, 2018.

Labor variables n= 184	Normal AP n = 111		High AP n = 73		Total n=184	
	n	%	n	%	n	%
Kilometers driven per week						
< 3000 km						
≥ 3000 km	72	39.1	36	19.6	108	58.7
	39	21.2	37	20.1	76	41.3
working hours per day						
< 10 hours	41	22.3	21	11.4	62	33.7
≥ 10 hours	70	38.0	52	28.3	122	66.3
days away from home						
< 14 days	70	38.0	36	19.6	106	57.6
≥ 14 days	41	22.3	37	20.1	78	42.4
Years of profession as a driver						
< 10 years	39	21.2	18	9.8	57	31.0
≥ 10 years	72	39.1	55	29.9	127	69.0
Hazardous cargo						
No	78	42.3	50	27.2	128	69.6
Yea	33	18.0	23	12.5	56	30.4
Car Type						
Truck	32	17.4	9	4.9	41	22.3
Cart	79	42.9	64	34.8	143	77.7
TOTAL	111	60.3	73	39.7	184	100.0

Table 2- Estimated odds ratio for the association between work characteristics and altered blood pressure values in truck drivers. Uberlândia, 2018.

Labor Variables	Gross Model OR (95% CI)	P	Adjusted Model OR (95% CI)	P
Kilometers driven per week				
< 3000 km				
≥ 3000 km	1	0.037*	1	0.028*
	1.89 (1.03 - 3.46)		2.32 (1.09 - 4.92)	
working hours per day				
< 10 hours	1	0.253	1	0.352
≥ 10 hours	1.45 (0.76 - 2.74)		1.42 (0.67 - 2.98)	
days away from home				
< 14 days	1	0.066	1	0.509
≥ 14 days	1.25 (0.64 - 2.44)		1.25 (0.63 - 2.49)	
Years of profession as a driver				
< 10 years	1	0.134	1	0.378
≥ 10 years	1.65 (0.85 - 3.20)		1.37 (0.67 - 2.77)	
Hazardous cargo				
No	1	0.798	1	0.522
Yea	1.08 (0.57 - 2.06)		0.78 (0.36 - 1.68)	
Vehicle Type				
Truck	1	0.009*	1	0.142
Cart	2.88 (1.28 - 6.47)		1.97 (0.79 - 4.87)	

OR: Odds Ratio IC: 95% Confidence Interval p = p value

DISCUSSION

The work environment and characteristics of the work organization can interfere with the quality of life of truck drivers and be predisposing factors for the development of risks for AH.[8]

Among the various risk factors detected among the truck drivers in this study, sedentary lifestyle and alcohol consumption stand out. In a study carried out by Sangaleti et al.[11] a high rate of truck drivers who did not practice physical activities (72.8%) was also observed.

Physical exercise practiced regular has an inverse relationship with the risk of AH and has a positive effect on the overall quality of life.[9] Physical activity combined with the restriction of alcohol consumption constitutes an important non-pharmacological method for reducing blood pressure.[12] In general, people who exercise, compared to sedentary people, are less likely to develop cardiovascular diseases, and this seems to be related, among others, to body weight control.[12-13]

Another risk factor of great impact on the onset of CVD is smoking. In 2015, the World Health Organization estimated the number of 950 million male smokers worldwide. In Brazil, this population represents a total of 22.1%.[14] In the present study, a percentage of smokers of 23.9% was noted, very close to the WHO estimate mentioned above, highlighting that all study participants were male. The practice of smoking can affect the consumption of alcoholic beverages, also making the figure of 50.0% alcohol drinkers present in the population of this study worrying. These results corroborate a study also carried out with truck drivers, where the number of participants who consumed alcoholic beverages was 52.7% and 19.8% were smokers.[15]

In a research on modifiable and non-modifiable risk factors for the development of AH in truck drivers, 23.7% of the participants reported the use of alcohol and tobacco.[16] In another study that evaluated the relationship between lifestyle and health risks, 23.20% of truck drivers were smokers.[8]

In another study conducted with 227 truck drivers who traveled on the BR 277, they showed that physical inactivity (72.8%), consumption of alcoholic beverages (66.8%), routine use of some type of stimulant during work activities predominated (19.2%) and smoking (29%). Only 20.8% had a healthy weight and 58.2% had an abdominal circumference greater than 102 cm. The diagnosis of arterial hypertension was confirmed in 45.2% and abnormal glucose levels were detected in 16.4%.[11]

Hypertension is considered the main risk factor for cardiovascular diseases.[1] In a study with truck drivers, 37.2% of them had

blood pressure levels compatible with arterial hypertension17, in another 15.2% of truck drivers had hypertension.5 In our study similar data were found where 39.7% had blood pressure levels above normal values.

The high number of truck drivers who presented high BP in this study can be explained by the underreporting of the diagnosis of AH in this population, since work characteristics influence the profile of health care behaviors, such as not routinely attending health services, not checking blood pressure frequently, not performing additional tests and not attending appointments with health professionals.

Several factors that may be directly or indirectly related to the occurrence of AH among truck drivers refer to the characteristics of the work activity of these professionals, such as the long working hours and large kilometers traveled per day. In the current study, it was observed that most participants (69.0%) worked for more than 10 years as truck drivers. A study that evaluated the relationship between work process and health of truck drivers observed that 29% of the participants had 11 to 20 years in the profession.[10] Another study with the same population reports that 19% worked from 11 to 15 years as truck drivers.[8]

Most participants traveled less than 3,000 km per week (58.7%) and drove for more than 10 hours daily (63.0%) (Table 2). Such results corroborate the study by Cavagioni et al.[17], where the mean of daily working day was 10 hours, covering approximately 800 km a day. In another study it was shown that the average daily working hours was 12 to 16 hours and kilometers traveled per day from 500 to 1000km.[8] The fact that most people traveled less than 3000 km per week in the current study, although driving for more than 10 hours a day, may be explained by the type of vehicle used, where 77.7% of truck drivers work with trailers, these being heavy and slower vehicles.

According to data from the National Transport Confederation (CNT)[7], truck drivers travel an average of 15 hours a day, including not only working days, but also weekends and, often, holidays. On average, 38% of these professionals have never had a health exam, which they reported as a reason, the lack of time.[18] These factors increase in relation to the lifestyle that truck drivers lead, such as exhausting workdays with little time to sleep and rest, several days away from home, long kilometers traveled and long years of work.[19-20]

High blood pressure was observed among truck drivers in this study and associated with work characteristics, as shown in the results of Table 2. Those who drive more than 3000 km per week have a 2.32-fold increased risk for altered blood

pressure compared to those who drive less than 3000 km per week, after adjusting the model for age, clinical, life and work habits.

Driving the type of vehicle "truck" presented an increased risk of 2.88 times for the altered pressure, but the statistical significance was not maintained after the model adjusted for other variables of the study. The other work variables: hours of work per day, time working as a truck driver, type of dangerous vehicle, time away from home between trips were not associated with high blood pressure.

CONCLUSION

In the present study, most participants had risk factors for HTHE, mainly sedentarism and alcoholism.

Among the work variables evaluated in the study, traveling more than 3000 km per week was associated with high BP values among truck drivers, after an adjusted model for sociodemographic, clinical, life and work habits variables.

The long working hours, related to the long distance traveled and/or to different other factors, can have a negative impact on the truck driver's living and health conditions and lead to their illness.

It is necessary to develop health policies aimed at this population in order to motivate them and provide conditions for them to acquire a healthier lifestyle, thus

avoiding the installation of AH and other health conditions.

Search limitations

The self-report of participants who may not have adequate knowledge of their health situation and the impossibility of being able to establish causal relationships stand out as limitations of this study, since the work methodology is cross-sectional.

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