

Continued use of drugs and working conditions among truck drivers

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Abstract *Few studies have been conducted on truck drivers with regard to their health problems, especially their drug consumption profile. This study aimed to determine the continuous use of drugs and to identify use-related professional characteristics among this category. A cross-sectional study was carried out with truck drivers parked at the sorting yard of the, Port of Paranaguá, Paraná. An interview to obtain socioeconomic data, data on health problems, working conditions and continued use of medication was performed. Of the drivers evaluated (n = 665), 21.1% reported a continuous use of some medication, mainly captopril (10.7%), metformin (10.3%), omeprazole (6.2%) and simvastatin (6.2%). Drivers with 16 or more years of professional experience (Prevalence Ratio [PR] 1.67; Confidence Interval [CI] 95% 1.11-2.51), truck owners (PR 1.38; CI 95% 1.03-1.86) and without formal labor contract (PR 1.49; CI 95% 1.11-2.00) had a higher prevalence of continuous use of medication. We noted that some working conditions play an important role in the continuous use of drugs by truck drivers.*

Key words *Truck drivers, Drug use, Working conditions, Pharmacoepidemiology*

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Introduction

Drugs are the leading technology in the management of acute and chronic health diseases¹. Despite the risk of adverse events, they contribute significantly to people's increased life expectancy and quality^{2,3}. Drug consumption is related to socioeconomic and demographic indicators, access to health services, life habits and the very presence of health disorders, especially chronic degenerative diseases^{4,5}.

In this context, we highlight working conditions, which may hinder access and adherence to drug treatment⁶ and increase the risk of health problems and therefore lead to a greater use of medicines, mainly due to stress or caused by the unsanitary conditions of the working environment⁷. Thus, certain professions may differ in their drug consumption profile.

Thus, some segments of society are not studied enough with regard to profile and drug use-associated factors. We note that epidemiological studies seek to carry out such investigations in the general population^{4,5}, children⁸, adolescents⁹, elderly¹⁰ or pregnant women¹¹. However, there are few studies on population groups with specific occupational exposures, such as truck drivers.

These professionals are mostly male^{12,13}, married or in common-law marriage¹³⁻¹⁶, with low schooling level^{13,14,17-19} and high professional experience²⁰. In addition, studies have evidenced a greater vulnerability of truck drivers to various health problems such as sexually transmitted diseases^{20,21}, psychoactive substance abuse^{13,18,22}, traffic accidents^{17,23}, workload-derived chronic pain^{19,24,25}, etc. Moreover, there are very few studies on the disease profile and drug consumption of this population of workers.

Truck drivers have access to professional and health services needs similar to the general population or that are specific to their own work²⁶ and should also be covered by strategies to promote the safe and proper use of drugs. Truck driver-specific health care strategies have emerged in some road stop points and promoted by organizations such as the Transport Social Service (SEST) and the National Transport Learning Service (SENAT)^{27,28}

It is worth noting that a study by Guedes *et al.*²⁹ showed that only 29.4% of truck drivers seek primary health care to treat their health problems, indicating the need for higher comprehension of this phenomenon, especially with regard to drug use. However, there is still a significant

gap of studies investigating the characteristics of drivers' drug consumption. Thus, this study aimed to demonstrate the continuous use of medications and identify professional features associated with truck drivers' use at the Port of Paranaguá, Paraná, Brazil.

Methodology

This is a cross-sectional study of truck drivers parked at the Screening Courtyard, Port of Paranaguá, Paraná. The Screening Patio is a local annex to the Port in which truck drivers await the screening of grains (soy, corn and soybean meal) from the Brazilian harvest and unloading in Paranaguá Port's silo complexes.

Prior to data collection, we conducted a pilot study in that courtyard, which evaluated the operational logistics of the collection site, vehicle flow, truck parking system in the yard and performed a pre-test of the data collection tool with ten drivers. This pre-test attempted to verify the feasibility of implementation and tool language adaptation to the population under study.

The collection tool consisted of a form, which gathered information on socio-demographic and economic features, lifestyle habits, health issues, working conditions and use of drugs. The study sample was defined with StatCalc, infinite population, estimated prevalence of 50% and 4% error margin, totaling 600 individuals. Drivers who reported less than one-year professional experience were excluded from this study.

Trained researchers collected data in July 2012 through convenience sampling, since the systematic distribution of drivers in the courtyard was undefined. During collection, two researchers roamed around the Port's courtyard, addressing drivers sitting in their own trucks, while other two remained at drivers' food or products purchase meeting points, and three more at a fixed spot, meeting drivers seeking information about the investigation voluntarily.

This study was approved by the Ethics Committee, State University of Londrina. Before the survey, drivers were informed about the objectives of the research and then read and signed the consent form.

The dependent variable analyzed was the continuous consumption of drugs. To assess this variable, at the time of the interview, we asked drivers whether they were continuously using any medication. If the answer was affirmative, we asked then what these drugs were by checking the

prescription or package, when available. Drugs used were listed by their generic names and subsequently classified according to the Anatomical Therapeutic Chemical Classification (ATC) of the World Health Organization, according to the first subgroup, which corresponds to the therapeutic group³⁰.

The independent variables (professional characteristics) were as follows: work experience as a driver (below sixteen years, sixteen years and over); work shift (fixed, alternating); truck ownership (employer; driver); employed (yes; no), income as a driver (below R\$ 2,500; R\$ 2,500.00 or more); driving time exceeding eight hours straight (yes, no); driving while being overly tired (yes, no); and wage (fixed, productivity or fixed + productivity). Variables work experience and income as a driver were categorized as median value.

The descriptive variables were sociodemographic and economic (age, schooling, marital status and access to private health insurance) and self-reported health disorders. All health problems were identified through truck drivers' self-reporting and converted to appropriate medical language. Variables age (up to 40 years; above 40 years), schooling (less than eight years of study, eight years of study and over) and access to health insurance (yes, no) were also used as control variables.

Data were double entered in Epiinfo 3.5.4® database for Windows® and were compared in the same program. Data were then analyzed with SPSS software, version 19.0. Windows®. Simple frequencies were calculated for qualitative variables, whereas quantitative variables were submitted to central tendency and dispersion (mean and standard deviation). Poisson logistic regression and 95% confidence interval (CI 95%), with an estimated prevalence ratio (PR) were used to determine the association between professional features and continuous use of drugs variables, with non-adjusted and adjusted analyzes (by age, schooling and access to health insurance plan). A $p < 0.05$ value was used to establish statistical significance.

Results

We approached 773 drivers during the collection period and we excluded five (5) drivers because their experience as truck drivers was less than one year. Of the remaining 768, 98 (12.8%) refused to participate. Of the 670 drivers who started the interview, five were called in to unload their ve-

hicles and did not provide all the necessary information. Thus, this study consisted of 665 truck drivers. All were male averaging 41.9 years (standard deviation [SD] = 11.1 years), with 50.2% aged over 40 years. Most of them (58.5%) had no more than eight schooling years, reported living maritally with companion (84.8%) and reported no access to private health plan (70.4%).

Average time experience as a truck driver was 18.2 years (SD = 11.4), ranging from one to 57 years, with 51.1% claiming having over 16 years of experience. Most drivers reported alternate work shifts (74.4%), not being truck owners (68.7%), being employed (62.4%) and receiving productivity-based wages (89.3%).

Most drivers ($n = 421$; 63.3%) - reported some health issue, with a total of 683 problems, highlighting chronic pain in general (arms, legs or back) (35.6%), systemic arterial hypertension (SAH) (16.2%), dyslipidemia (12.6%), hemorrhoids (8.7%) and diabetes mellitus (DM) (7.5%). On average, respondents had 1.03 health problems (SD = 1.05) with a minimum of zero and a maximum of five health disorders.

Of the 670 drivers interviewed, 140 (21.1%) reported continuous use of some medication at the time of investigation. Of these, 72.9% and 18.6% used one and two drugs, respectively. In total, 194 drugs were reported, with a mean of 1.38 (SD = 0.70) per driver and, at most, four drugs per driver. Drugs most often quoted by respondents were captopril (10.7%), metformin (10.3%), omeprazole (6.2%), simvastatin (6.2%), enalapril (5.6%) and hydrochlorothiazide (5.2%) (Table 1).

With regard to drug treatment, of the top five diseases reported by truck drivers, SAH and DM showed the highest proportion of treatment (47.2% and 48.0%, respectively). Moreover, chronic musculoskeletal pain reported by drivers showed 2.5% treatment proportion, and hemorrhoids, 3.4% (Table 2).

Professional features that were associated with the continuous use of medicines in the non-adjusted model were 16 or more years work experience as a driver; driver's own truck ownership; and no employment relationship (no record in working papers). After adjustments (for age, schooling and access to health plan), these variables remained associated with the continued use of drugs: 16 or more years work experience as a driver (PR 1.67; CI 95%; 1.11-2.51); driver's own truck ownership (PR 1.38; CI 95%; 1.03-1.86) and no employment relationship (PR 1.49; CI 95%; 1.11-2.00) (Table 3). The higher

age group (over 40 years) was also associated with the continuous use of medicines in all the adjusted analyzes.

Discussion

Musculoskeletal chronic pain in general appeared as a major ailment reported by drivers analyzed, which is in line with previous studies that evaluated this professional category^{19,24,25,31}. The driver's role is not restricted to truck driving, with a need to perform or assist in the loading or unloading of transported goods³², as well as driving many hours straight, which can increase the risk of health injuries and diseases^{33,34}.

The existence of cardiovascular risk factors (hypertension, diabetes and dyslipidemias) was also mentioned by other drivers evaluated in Brazil^{19,35-39}, while lower than those mentioned in population-based prevalence studies⁴⁰⁻⁴³, particularly SAH^{44,45}. It is believed that this occurs because self-reported information suffer the influence of underdiagnosis, failure to understand one's own condition or driver's choice not to report his ailment. In addition, worth noting is the healthy worker effect, in other words, workers with less complex health conditions are likely to continue working while those with the worst conditions tend to abandon the profession^{46,47}, underestimating the prevalence of some diseases.

Regarding drug consumption, similarity was noted in those reported by drivers with those of the general population^{4,5,48,49}. In a study in Campinas-SP, hydrochlorothiazide, captopril and enalapril stood out among the most consumed continuous-use drugs⁴. In surveys conducted in Grossa-PR⁵ Ponta and Campinas-SP⁴, continuous-use drugs for cardiovascular and digestive systems and metabolism were the most reported by respondents.

Reduced drug treatment proportion of reported major injuries is an important aspect identified in this study. Studies of individuals who recognized their condition of SAH^{50,51} and DM^{52,53} carriers showed treatment rates results higher than those of this study. Low treatment rates found among truck drivers may be related to difficult access and adherence to drug treatment, especially because these professionals did not show a routine (working conditions) that facilitated and encouraged the proper and/or continuous use of drugs, as well as to their lifestyle, which often goes against the proper management of patients with chronic diseases such as SAH and DM.

Table 1. Distribution of drugs used by truck drivers by therapeutic group, Port of Paranaguá, Paranaguá, Paraná, Brazil (n = 194).

Therapeutic Group*	n	%
Drugs acting on the renin-angiotensin system (C09)	44	22.6
Captopril	21	10.7
Enalapril	11	5.6
Losartan	6	3.1
Valsartam	5	2.7
Candesartan	1	0.5
Drugs used for Diabetes (A10)	33	17.0
Metformin	20	10.3
Glibenclamide	8	4.2
Gliclazide	3	1.5
Glimepiride	1	0.5
Insulin	1	0.5
Drugs for acid-related disorders (A02)	14	7.2
Omeprazole	12	6.2
Lansoprazole	1	0.5
Pantoprazole	1	0.5
Lipid-modifying drugs (C10)	14	7.2
Simvastatin	12	6.2
Atorvastatin	1	0.5
Fenofibrate	1	0.5
Beta blockers (C07)	13	6.7
Atenolol	7	3.7
Metoprolol	3	1.5
Propranolol	3	1.5
Diuretics (C03)	10	5.2
Hydrochlorothiazide	10	5.2
Anti-inflammatory and anti-rheumatic drugs (M01)	7	3.7
Diclofenac and associations	5	2.7
Diclofenac	1	0.5
Nimesulide	1	0.5
Antithrombotic drugs (B01)	7	3.7
Acetylsalicylic acid	5	2.7
Warfarin	2	1.0
Other therapeutic groups**	34	17.5

* Eighteen (9.2%) unidentified drugs have not been shown;

** All therapeutic groups with frequency below 2.0%.

We noticed that greater experience (16 years or more) as a truck driver showed a strong association with the continuous use of drugs. It is expected that drivers with more experience, with some exceptions, are the oldest (we emphasize that a higher age group was also associated with the use of drugs in this study). Thus, since studies in the general population show that there is

a proportional increase in the consumption of drugs with age^{4,54}, there is also a greater level of this consumption with increased professional experience. Still, we can consider that working

conditions experienced by drivers throughout the profession may have contributed to increased prevalence of some diseases^{24,25,35}, favoring a higher continuous use of drugs.

We expect that the lack of employment relationship, usually related to truck driver's own truck ownership, causes the driver to spend a long time waiting for goods to be loaded and transport, which would increase their working day and make it difficult to seek medical treatment. However, as this study found an association between higher prevalence of continuous use of medication and truck drivers with no employment relationship, we believe that drivers with formal ties would have greater difficulty in controlling their working hours, delaying access to health services and consequently the diagnosis and treatment of existing diseases.

We took some methodological precautions to ensure the internal validity of results, such

Table 2. Drug treatment of five major health disorders reported by truck drivers, Port of Paranaguá, Paranaguá, Paraná, Brazil, 2012 (n = 421).

Reported Health Disorders	n	Drug treatment n (%)
Chronic Musculoskeletal Pain	237	6 (2.5)
Systemic arterial hypertension	108	51 (47.2)
Dyslipidemia	84	10 (11.9)
Hemorrhoids	58	2 (3.4)
<i>Diabetes mellitus</i>	50	24 (48.0)

Table 3. Association between professional characteristics and continuous use of drugs by truck drivers (non-adjusted and adjusted), Port of Paranaguá, Paranaguá, Paraná, Brazil, 2012 (n = 665).

Variables	Continuous Use of Drugs					
	Total		PR (CI 95%)			
	n	%	n	%	Non-adjusted	Adjusted ^a
Work experience (in years)						
Below 16	325	48.9	39	12.0	1.00	1.00
16 and over	340	51.1	101	29.7	2.48 (1.77-3.47)***	1.67 (1.11-2.51)*
Work shift						
Fixed	170	25.6	32	18.8	1.00	1.00
Alternating	495	74.4	108	21.8	1.16 (0.81-1.66)	1.03 (0.73-1.45)
Truck ownership						
Employer	457	68.7	85	18.6	1.00	1.00
Driver	208	31.3	55	26.4	1.42 (1.07-1.91)*	1.38 (1.03-1.86)*
Employment relationship						
Yes	415	62.4	74	17.8	1.00	1.00
No	250	37.6	66	26.4	1.48 (1.11-1.98)**	1.49 (1.11-2.00)**
Income as a driver (in Brazilian Reais)						
Below 2,500	390	58.6	74	19.0	0.79 (0.59-1.06)	0.81 (0.61-1.07)
2,500 and over	275	41.4	66	24.0	1.00	1.00
Continuous driving for over eight hours						
Yes	101	15.2	18	17.8	0.82 (0.53-1.29)	0.85 (0.55-1.31)
No	564	84.8	122	21.6	1.00	1.00
Driving while very fatigued						
Yes	168	25.3	30	17.9	0.81 (0.56-1.16)	0.93 (0.65-1.32)
No	497	74.7	110	22.1	1.00	1.00
Salary-related characteristics						
Fixed	71	10.7	13	18.3	1.00	1.00
Productivity or fixed + productivity	594	89.3	127	21.4	1.17 (0.70-1.95)	1.02 (0.62-1.68)

PR= Prevalence Ratio; CI = Confidence Interval. ¹Adjusted for age, schooling and access to health plan. *p < 0.05; **p < 0.01; ***p < 0.001.

as conducting pilot study and preparation of a manual of instructions for collectors. However, given the studied location's working dynamics, we chose participants through a convenience selection, a fact that makes it impossible to generalize the results to the total number of drivers who attended the screening of the Courtyard Port of Paranaguá in the study period. Furthermore, we should stress that there may be bias in the recall process, measurement or information in the variables obtained by indirect measurements with the use of a form, especially those relating to diseases and medications.

In the face of reported diseases and identified continuous-use drugs, we observe that the epidemiological and pharmacotherapeutic profile of rated drivers are similar to the general population, particularly concerning cardiovascular diseases and use of medicines for their treatment, with the exception of SAH, which showed the prevalence rates lower than population-based studies. Also noteworthy is the undertreatment of identified diseases, and especially identification of the relationship between some professional features (work experience, employment relationship and truck ownership) and the use of drugs.

Truck drivers have unique characteristics, specifically for staying many days, weeks or even

months away from their homes and his families, which implies the need to adopt health promotion strategies different from those of the general population. Thus, encouraging stoppage points, carriers and the loading and unloading process to have more appropriate structures to meet this specific population may favor the reduction and the impact of major health problems identified in the health of this population group. Now, only specific initiatives at some gas filling stations of Brazilian roads are noted, where medical and dental care, tracking health problems and guidance on men health are conducted, but which are still incipient considering the needs of this population group. Thus, it is important to ensure drivers' access to health professionals who can perform the correct diagnosis of their health problems and perform pharmacological and non-pharmacological therapy consistent with their unique needs.

Finally, it is worth emphasizing the importance of preventive and public health measures within the working conditions and actions related to workers' health surveillance⁵⁵, reducing the risks to which truck drivers are submitted, both for individual and collective health, such as the involvement in road traffic accidents.

Collaborations

All authors have made substantial contributions to justify authorship of the article. E Giroto, SM Andrade and AE tables outlined the study. E Giroto and CM Guidoni performed the statistical anal-

ysis and wrote the first draft of the manuscript. AD González supervised the statistical analysis and manuscript preparation. SM Andrade and AE Mesas contributed to the preparation and review of the manuscript. All authors approved the final version of the submitted article.

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