



Assessment of the nutritional profile through the 24-hour record in truckers in the central-southern Brazilian region: a prospective observational cross-sectional study

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Abstract

Introduction: Truck drivers are of great importance to the Brazilian economy. The exorbitant workload and long periods away from home are causes of the adoption of unhealthy eating habits, such as the intake of foods that are sources of lipids with high caloric value. Extensive travel contributes to a sedentary lifestyle. This causes health damage and comorbidities such as diabetes, obesity, hypertension, stress, and depression. Based on these considerations, the present study evaluates the nutritional profile of truck drivers.

Objective: It was to evaluate the food quality of truck drivers in the Center-South Geoeconomic Region of the country, comparing the portions of macronutrients consumed with those recommended by the Brazilian Food Pyramid. **Methods:** Observational and cross-sectional study. The consumption of macronutrients by 100 truck drivers from the states of São Paulo, Minas Gerais, Mato Grosso do Sul and Goiás was qualitatively evaluated. The research used 24-hour food recalls, completed online, via Google Forms, between June and September 2020. Statistical analysis was obtained by calculating the Wilcoxon's non-parametric test to compare the medians of ingested portions and the ideas. **Results:** The Wilcoxon test identified significant differences between the number of servings consumed by truck drivers and the recommended ideal with regard to fruits, vegetables/vegetables, oils/fats, meats/eggs, sweets/sugars, milk, cheese and derivatives ($p < 0.0001$). Only the portions of carbohydrates were in accordance with the nutritional recommendations, that

is, six portions a day (ns). In the class of sugars and sweets, consumption four times higher than recommended was observed. In the meat and eggs category, consumption was double the ideal. In oils and fats, triple the recommended value. The consumption of milk and dairy products is three times less than ideal, such as vegetables. Finally, the average value of fruit portions eaten by truck drivers was zero, while the recommended value is three. **Conclusion:** Among the food groups analyzed, carbohydrates were the only group in which consumption was adequate. There was a significant excess of sweets and fats intake by truck drivers, when compared to the ideal amount indicated by the food pyramid. The intake of milk and dairy products, vegetables and legumes was deficient, three times lower than recommended. Fruits counted as a median intake value of zero servings.

Keywords: Nutrition. Nutrology. Truckers. Truck drivers. Food quality. Health.

Introduction

Truck drivers are of great importance for the movement of the country's economy, and Brazil has an approximate fleet of 1.8 million trucks and a population of more than 700,000 truck drivers, composed mostly of men [1]. According to the Ministry of Labor and Employment, truck drivers are self-employed or salaried workers who provide services to companies in the field of logistics or land transport [2]. This class of workers is influenced by environmental and climatic factors, such as poor road and highway conditions, intense traffic and

precarious vehicle conditions. There is also the interference of factors related to health, work and lifestyle conditions, as a result of their professional activity.

The countless hours of work and the variety of workplaces are major causes of unhealthy eating habits, especially foods with low nutritional value that are sources of high-calorie lipids [3] and large amounts of sodium, caffeinated beverages and alcohol, mostly at night. Shift work, routine for most Brazilian truck drivers, seems to be the solution to the large workload, with the drivers taking turns. However, the current organization aims to maximize profits and meet the local needs of all customers in contempt of the worker. This commercialization of the driver, in addition to harming physical and mental well-being, exposes truck drivers to greater risks of work accidents.

The reduced time of these workers for leisure and self-care activities contributes to a tendency towards an increase in BMI, increasing the risk of obesity for those who sleep less than 6 hours a night. This interferes with appetite and satiety, favoring the development of obesity and Chronic Noncommunicable Diseases (CNDs) [4].

The high workload contributes to a sedentary lifestyle and lack of physical activity, which results in low energy expenditure. This fact causes damage to health and some pathologies such as diabetes, obesity, hypertension, stress, depression, among others [5]. Based on these considerations, the present study evaluates the nutritional profile of truck drivers.

Therefore, the present study aimed to analyze the food quality of professional truck drivers in the Center-South geoeconomic region of the country. Compare the portions consumed with those recommended by the Brazilian Food Pyramid of the Ministry of Health.

Methods

Study Design

This study followed a prospective observational cross-sectional model, following the rules of clinical research of the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology), available at: <https://www.strobe-statement.org/>. The present study was developed through the application of forms, via Google Forms, to 100 truck drivers, 99 male, and 1 female, from the states of Sao Paulo, Minas Gerais, Mato Grosso do Sul, and Goias.

Ethical Approval

This study was analyzed and approved by the

Research Ethics Committee according to a substantiated opinion number 5.270.708, and obtaining the Informed Consent Form according to CNS/CONEP Resolution 466/12.

Questionnaire

The application of the forms was done online during the period from June to September 2020, in which they were sent through the WhatsApp application to the respective truck drivers. The first part of the document consisted of personal questions, including the initials of the name, age, sex, and state of residence, and the consent form, accepted by all participants. The second part consisted of the 24-hour food recall, a dietary survey used as a parameter for nutritional assessment, elaborated by six open questions, which questioned exactly everything that was ingested by the drivers during the six main meals: breakfast, and morning snack, lunch, afternoon snack, dinner, and supper.

The study chose to use the 24-hour food recall because it was easy to understand, even in illiterate populations, and because it was a recent food consumption, which was easily remembered by the participants. Along with the document to be answered, texts and audios were sent that explained the purpose of the study, what the 24-hour food recall was and how they should describe everything that was consumed in the main meals of the last 24 hours, along with the respective approximate amounts of each food and/or beverage.

Statistical Analysis

All data were entered into tables in the Microsoft Excel program and statistical analysis was obtained by calculating Wilcoxon's non-parametric test to compare the medians of ingested portions and the ideas described by the Brazilian Food Pyramid.

Results

In the present study, 100 truck drivers from the Center-South Brazilian Geoeconomic Region participated, being one female and 99 male. The age group is between 25 and 72 years old. In comparison with the values presented in the Brazilian Food Pyramid, recommended by the Ministry of Health, the only macronutrient adequately consumed by truck drivers was carbohydrate (**Figure 1**). Regarding its consumption, the median of the daily amount of servings consumed was approximately 6 (ns).

In the meat and eggs class, consumption exceeded

the recommendations (**Figure 2**). It is suggested to consume one serving per day for this group, but the median of servings consumed by truck drivers was two ($p < 0.0001$). Fruit consumption proved to be extremely deficient. The mean value of fruit portions ingested was zero ($p < 0.0001$), while the recommended amount was three (**Figure 3**).

Both the intake of vegetables and milk and dairy products was three times lower than the recommended amount of daily portions. In both classes, the median obtained was one portion ($p < 0.0001$), while there should be three (**Figures 4 and 5**). As for oils and fats, their consumption was triple the oriented value (Figure 6). The median of servings was 3 ($p < 0.0001$), on the other hand, consumption should be one per day.

Finally, in the category of sugars and sweets, there was also a statistically significant difference between actual and ideal consumption, since the median of servings was four ($p < 0.0001$), while the correct one is only one (**Figure 7**).

Discussion

The present study aimed to analyze the food quality of these workers so indispensable for the country's economy [5]. Through the online questionnaire applied, the nutritional profile evaluated was in disagreement with that recommended by the Brazilian Food Pyramid.

It was observed that there is an inadequate consumption of fruits; vegetables and greens; oil and fat; Meat and eggs; sweets and sugars; milk, cheese and derivatives ($p < 0.0001$). Only the portions of carbohydrates were in accordance with the nutritional recommendations ($p = ns$). The largest surplus of the recommended value was in the class of sugars and sweets, being four times higher than recommended. In the category of oils and fats, consumption was triple the ideal. In line with the present study, Penteado et al [6] show that 33.25% of the truck drivers interviewed said they always had a fatty diet and 51.25% reported having a fatty diet occasionally.

Figure 1. Median obtained and standard deviation of carbohydrate portions.

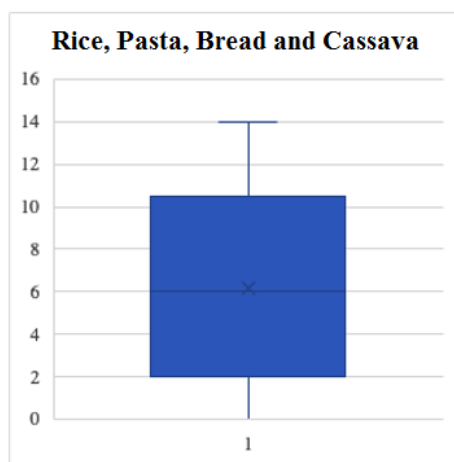


Figure 2. Median obtained and standard deviation of meat and egg portions.



Figure 3. Median obtained and standard deviation of fruit portions.

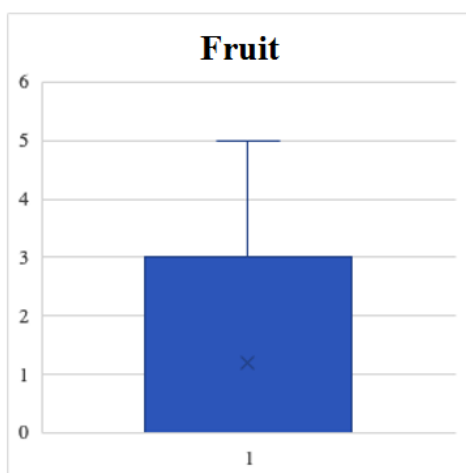


Figure 4. Median obtained and standard deviation of vegetables portions.

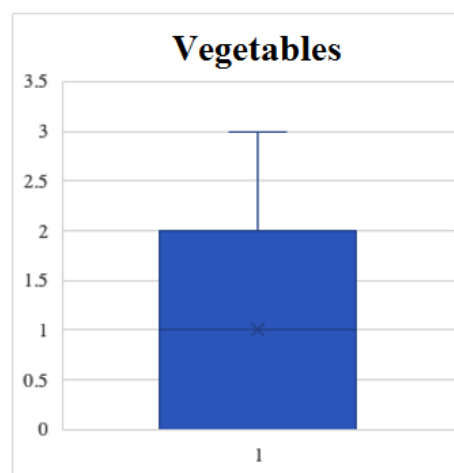
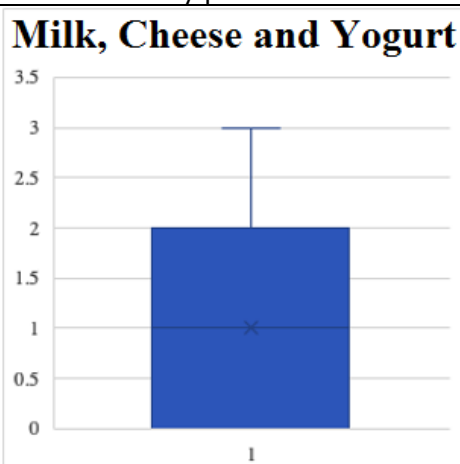
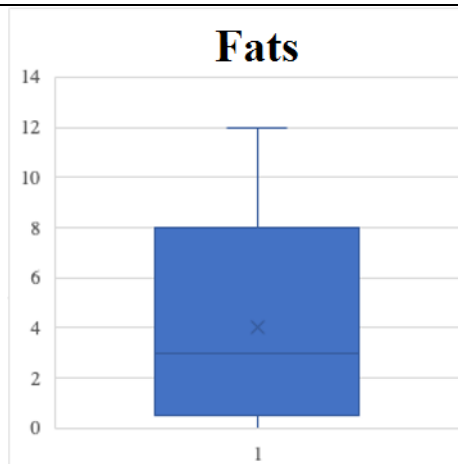
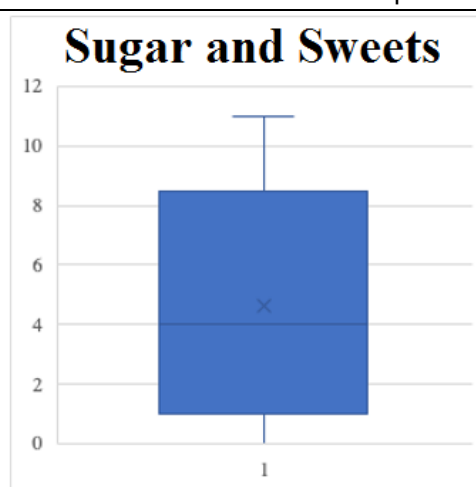


Figure 5. Median obtained and standard deviation of portions of milk and dairy products.**Figure 6.** Median obtained and standard deviation of the portions of oils and fats.**Figure 7.** Median obtained and standard deviation of the portions of sugars and sweets.

The consumption of meat and eggs was twice the ideal. Regarding the lack of recommended portions, the classes of milk and dairy products; vegetables and greens were three times smaller than the ideal. Regarding fruit intake, the median value obtained was zero, while the recommended amount is three servings daily. In the present study, the carbohydrate macronutrient (rice, pasta, bread, tubers and roots) was the only group in which the intake was adequate. Such findings are shaped by the fact that truck drivers eat in highway restaurants, with precarious food supply, with high caloric value and low nutritional value, such as snacks, processed foods, fatty meats, soft drinks and the like.

Comparing the results obtained in our research with the other studies mentioned, we found that the diet of truck drivers, in general, is considered inadequate, which, in the long term, can bring numerous comorbidities to these people, such as gastritis, diabetes, high cholesterol, obesity, hypertension [7] and, consequently, worsening of the quality of life. Another study, carried out in the city of São Paulo,

showed a significant presence of cardiovascular risk factors and metabolic syndrome among truck drivers. The authors found an above-normal BMI and waist circumference in more than half of the sample [8]. Domingos et al [9] observed overweight in 44.6% of truck drivers, obesity in 27.2% and only 28.2% of drivers with BMI considered adequate. The results of the study by Lago [10] indicate a high frequency of cardiovascular risk factors in truck drivers, which may reflect poor diet, lack of physical conditioning and high level of stress.

In this way, having the recent and updated literature parallel and compatible with the data collected in this research, we can, consequently, stimulate a significant result of clinical importance. 61 articles were identified and 18 studies were included that point to risk factors for non-communicable chronic diseases, as well as the presence of these diseases in some truck drivers. It was also found that the truck driver's trajectory interferes with his health, as it makes him vulnerable to adopting unhealthy lifestyle habits, a behavior that can be found in professionals subjected to similar working conditions [11].

Unfortunately, despite the undeniable importance of this class, the conditions for exercising the profession of truck driver are related to bad eating habits. Most respondents did not report consuming macronutrients properly. Resende et al [12] showed that truck drivers' food is precarious, results similar to ours. The vast majority of drivers prepare food in an adapted place such as a kitchen, on the outside of the truck. It was noted that the meal is simple and without variety.

Working conditions put truck drivers in dangerous situations, especially road accidents and robberies, causing them to remain under constant surveillance [13]. The working conditions of truck drivers can therefore be considered dangerous and stressful, as long journeys require a high level of attention behind the wheel and a great responsibility with the preservation and delivery of cargo.

The pressure of deadlines for goods to arrive quickly at their destination makes them more vulnerable to stress, use of stimulant drugs, sleep deficits, among other problems that can lead to illness [14]. Due to lack of time, long-haul truck drivers, in general, eat in restaurants on the side of the road, offering high-calorie and low-nutrition foods, as well as empty calories, especially through the use of alcohol. Poor digestion and an unpleasant feeling in the stomach are common symptoms for truck drivers [15]. It is undoubted: the quality of life would be linked to the impact of the health status on the subject's ability to live fully [16-18].

During the initial approach to explain the research and fill in the form, some truck drivers spontaneously wanted to expose their realities even more, through reports, such as the following:

"(I didn't eat) anything, there's not even much time (to eat)" (E.1)

"But there are days in the truck driver's life that there is no time for lunch; only eats at night" (E.2)

"On the road we don't have much time to do different things, we don't even have time to have a snack" (E.3)

"There are days when you feel like giving up, you know? When we most need people who can help us, we are at hand" (E.4)

"We don't have that weekend that we wanted so much to have next to the ones we love" (E.5)

It is important to highlight that the collection of food reports was carried out through an online form, due to the coronavirus pandemic (SARS-CoV-2). Thus, some questionnaires had to be discarded, due to truck

drivers not filling it correctly (example: not specifying portions), which generated a loss of data. However, the stipulated sample of 100 respondents was obtained.

Conclusion

Despite the adversities promoted by the coronavirus pandemic in the interaction with the interviewees, we obtained the desired data for the closing of the research. Thus, it is concluded that the food intake of the interviewed truck drivers does not follow the values recommended by the Brazilian Food Pyramid. Among the food groups analyzed, only cereals, bread, tubers, and roots (carbohydrates) were consumed following the established pattern. While the intake of meat and eggs exceeded twice, sugars and sweets were consumed four times more than recommended. The consumption of oils and fats was also high, three times above the proposed. Vegetables and vegetables, as well as milk and dairy products, were consumed three times below the ideal amount. The median value of fruit consumption was zero, while daily consumption of three servings of this group is expected.

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Not applicable.

Ethics approval

This study was analyzed and approved by the Research Ethics Committee according to a substantiated opinion number 5.270.708, and obtaining the Informed Consent Form according to CNS/CONEP Resolution 466/12.

Informed consent

The patient signed the consent form.

Data sharing statement

No additional data are available.

Conflict of interest

The authors declare no conflict of interest.

Similarity check

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