# Eating Habits and Sedentary Behavior Related to Obesity in Inter-Urban Carriers Cooperatives

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## ABSTRACT

This is a case-control analytical study with a population of 180 intercity transport drivers, a sample of 180 participants equivalent to the universe, determined on a 1:1 basis. The sample was selected using a non-probability convenience sampling procedure, using a questionnaire with dichotomous and Likert-scale questions. The prevalence age was 38 years, 51% were married, 61% had secondary education, and 82% lived in an urban area. Regarding dietary habits, fat consumption was a protective factor with an OR of 0.651, p-value >0.424, high-carbohydrate foods with an OR of 0.390, p-value >0.006, and the frequency of energy drink consumption was a risk factor of 1.2 times the probability of developing the problem without any association between variables. The most relevant sedentary behaviors in terms of physical activity were OR: 0.952, p-value >0.025, acting as a protective factor, with walking being a protective factor. OR: 0.957, p-value >0.022. Staying active for more than 4 hours acted as a risk factor, 1.366 times more likely to develop obesity. P-value >1.090, with no association between variables. In conclusion, it is essential to carry out activities that promote healthy eating habits and physical activity, as well as exercise and physical activity, given the level of sedentary lifestyle they present. Thus, obesity can be avoided by providing modifiable guidelines and strategies for optimal food consumption.

**Keywords:** Eating Habits, Sedentary Behavior, Obesity, Transporters.

## INTRODUCTION

Obesity has become a major public health problem in both developed and developing countries. The World Health Organization (WHO) considers obesity an epidemic of chronic non-communicable diseases (NCDs) and estimates that by 2015, approximately 2.3 billion adults worldwide will be overweight and more than 700 million will be obese [1].

Obesity is the fifth leading risk factor for human death worldwide. Each year, at least 2.8 million adults die as a result of obesity [2].

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The National Health and Nutrition Examination Survey (2003–2004) in the United States showed a prevalence of obesity in men and women of 31.1% and 33.2%, respectively, with a higher predisposition among non-Hispanic black Americans and Mexicans. Between 2009 and 2010, the prevalence of obesity increased to 36% among American men and women [3].

In Peru, obesity primarily affects young adults and adults, with one in three young adults being overweight or obese and one in two adults being overweight or obese [4].

Meanwhile, in Argentina, the prevalence of overweight is 47.8% in men and 35.9% in women, while the prevalence of obesity in men and women is 14.7% and 20.5%, respectively [5].

In Costa Rica and Panama, vehicle drivers constitute a labor group that is exposed to a higher prevalence of overweight and obesity than the general population [6].

This may be favored by the conditions of their work, i.e. sedentary lifestyle (little time for practicing any sport or physical activity, more than 12 hours behind the wheel, few rest intervals), changes in eating habits (predominance of fried foods, low consumption of fruits/vegetables and fiber), hours of sleep below 8 hours, exposure to pollution and work stress [6].

In Nicaragua, regarding the prevalence and personal factors associated with overweight and obesity in public transport drivers, there is a high overall prevalence of overweight/obesity in drivers, representing 56% of the population, making it a very common problem in this population group. Drivers' working conditions and health behaviors include working more than 12 hours a day, not sleeping 8 hours a day, not engaging in any physical activity, and not following a healthy diet, all of which affect their quality of life [7,8].

It is vitally important to study the two factors that influence the development of obesity in transporters. There are few research studies on this very common problem, which arises from unhealthy eating habits, coupled with a lack of physical activity.

The following research work is prepared in accordance with Sustainable Development Goal number 3, which speaks to us about health and well-being, which is in line with our research problem to provide an outlet for our research process [9].

According to a report prepared by the World Health Organization (WHO), in 2012 there were 310 million obese people in the world (5%), in 2014 these figures reached 600 million obese people (9%) and in 2016 it reached 760 million obese people (13%), this being a major public health problem worldwide and its prevalence is increasing alarmingly [10].

**Justification**

Overweight and obesity are defined as an abnormal or excessive accumulation of fat that can be harmful to health. The WHO defines overweight as a BMI equal to or greater than 25, and obesity as a BMI equal to or greater than 30. In 2016 the obesity rate reached 760 million people (13%), Every year, at least 2.8 million people die from obesity or overweight; 65% of the world's population lives in countries where overweight and obesity cause more deaths than underweight.

An increase in the consumption of high-calorie foods without a proportional increase in physical activity leads to weight gain. A decrease in physical activity also leads to an energy imbalance that leads to weight gain. Engaging in moderate-intensity physical activity for 30 minutes a day on most days of the week reduces the risk of cardiovascular disease, diabetes, colon cancer, and breast cancer.

This study is of great importance because it will help us determine the relevant factors associated with the development of obesity in Western transport workers. It will also help us to adopt a very important role in nutritional education and physical activity for this group of workers.

The results of this study will be of great use to:

**The General Directive for intercity transport operators,** so that they can promote the importance of healthy eating and physical activity through talks and conferences.

**To intercity transport workers from the** Study Cooperatives, so they can become aware of good eating habits and the importance of physical activity.

**To the researchers,** since this study will be very useful for future research on this health issue.

**General Objective**

To analyze eating habits and sedentary behavior related to obesity in transporters in western Nicaragua.

**Specific Objectives**

To characterize the study population demographically.

Identify the Eating Habits of Intercity Transporters.

Evaluate the Sedentary Behaviors of Intercity Transporters in the West.

**Problem Statement**

Obesity is a chronic disease with a high prevalence in most countries around the world. It is characterized by increased body fat, which, depending on its severity and topographic location, can lead to health risks that limit life expectancy and quality of life.

According to the World Health Organization, obesity is a chronic disease characterized by increased body fat, associated with increased health risks [1].

Obesity is one of the leading public health problems worldwide. It is currently considered the pandemic of the 21st century. Obesity causes multiple chronic diseases that affect quality of life and life expectancy, triggering a variety of conditions such as high blood pressure, diabetes mellitus, and heart disease, which are consequences of this condition.

The poor eating habits of transport workers start with simple aspects, ranging from not having a specific mealtime due to the pace of the workday, to poor food choices at the time of consumption.

Which time they remain seated. This means they are exposed to expending fewer calories and therefore have a slower metabolism, which causes a risk of being overweight, as well as developing chronic diseases such as diabetes, cardiovascular disease and musculoskeletal disorders.

Considering the factors that influence the life of the carrier to suffer from obesity, we have formulated the following research question:

**What is the relationship between eating habits and sedentary behavior related to obesity in intercity transport drivers**

## METHODOLOGY

**Type of Study:** Epidemiological Case-Control Analysis.

- **Analytical:** Because it analyzes the relationships between variables and the individual's health status, it goes beyond a description of the disease in a population,

thus establishing the association of obesity with eating habits and sedentary behaviors.

- **Case-Control:** It is a study in which subjects are selected based on whether they have (cases) or do not have (controls) a certain disease.
  o The cases are intercity transporters who are obese.
  o The controls are intercity transporters who are not obese.

**Area of Study:** This study was carried out on intercity transporters of public transport cooperatives in the West.

The municipality's intercity transport units are classified into four cooperatives, each divided into 12 routes that travel along the city's main thoroughfares. Workers (drivers and conductors) have a rest area depending on their route, where they have 25 to 30 minutes, which is sometimes used to clean the transport unit, eat (breakfast, lunch, or a snack), and rest. The rest areas are located in remote locations from the center of the municipality. They include cafeterias where drivers eat their meals, grocery stores, and some are near schools and local parks in the neighborhoods.

**Analysis Unit:** It was made up of intercity route transporters, drivers and collectors, as well as their impact on their sedentary work areas.

**Study Population:** Transport collectors and drivers who work in bus terminals and are exposed to long workdays where they spend most of their time sitting in the transport unit.

**Universe:** The study universe consisted of 180 intercity transporters (drivers and collectors) from the West.

**Sample:** To calculate the sample of cases and controls, the statistical formula for the finite population was applied.

$$n = Z^2 \times P \times Q \times N / (e)^2 (N-1) + Z^2 \times P \times Q$$

N= Total population (180)

P=Proportion of occurrence in the 50% event (0.5)

Q= Complement of P (1-P) =1-0.5

Z= Confidence level

**Sources of information:**

- **Primary:** People under study, whether these are drivers and collectors.

- **Secondary:** Documents filed with cooperatives include time cards for each bus, entry and exit rolls, bus codes, and routes.

## Definition of comparison group

- **Case Definition:** Transporters from different cooperatives who present Obesity with BMI <30, who present a WHR <0.94 and a PB <25.3.

- **Definition of Controls:** Transporters from the different cooperatives who do not present Obesity with BMI < 30, who do not present a WHR < 0.94 and who do not present a PB < 25.3.

## Inclusion Criteria (Cases)

- That meets case criteria.

- BMI < 30

- ICC (Hip Waist Ratio) < 0.94

- PB (Arm Perimeter) < 25.3

- That you agree to participate in the study.

- Be a transporter for the Cooperatives that are actively involved.

- Male gender.

## Exclusion Criteria (Controls)

- Let them be taxi cadets.

- Let them be tricycle drivers.

- That they agree to participate in the study.

- That they are transporters of other interurban cooperatives

## Study Variables

- **Dependent Variable:** Obesity

- **Independent variables:** Eating Habits. Sedentary Behavior.

## Method of information collection

The data collection method was a survey. This involves obtaining information from the study population, where they provided their opinions and knowledge about the eating habits and sedentary behaviors that predispose them to obesity.

To access the information, permission and authorization were requested from the transport cooperatives, explaining the objective of the research.

## Data collection technique and instrument

The instrument implemented is a questionnaire, composed of closed-ended questions and multiple-choice or Likert-scale questions that address the study's objectives. The survey includes sociodemographic data from respondents and closed-ended questions about the study's two independent variables: Eating Habits and Sedentary Behavior.

## Information processing and analysis

The collected information was processed in the statistical program SSPS version 25. The analysis of the information was carried out through analytical statistics, contingency tables or 2x2 tables were used to demonstrate the association of the variables and simple tables for sociodemographic data. The Chi Square statistical test ($X^2$) was used: When $X^2$ is less than 0.5 there is an association of variables and when $X^2$ is greater than 0.5 there is no association of variables.

The Odds Ratio test was used to calculate the risk of a variable; an OR less than 1 indicates that it is a protective factor, while an OR greater than 1 indicates that it is a risk factor; if the OR is equal to 1, it is a non-associated factor.

The analysis was performed with a 95% confidence interval, using the natural limits (upper and lower limits) to test the statistical significance of the variables. If the Ln values contain 1 within their range, this means there is no statistical significance, while if the Ln values contain 1 outside their range, this means there is statistical significance.

**Ethical Aspects**

- **Charity:** None of the participants' physical, psychological, social, or spiritual integrity was harmed. The data provided by our respondents was protected to the maximum extent possible.

- **Informed Consent:** Individuals were asked to participate voluntarily in the study, and the objectives and usefulness of the research were explained to them. The carrier signed the informed consent document, agreeing to participate in the study.

- **Autonomy:** The participant in the study was free to participate, taking into account that if the participant

withdrew before the end of the study, the data already collected would be used in that study.

- **Anonymity:** The participant was told that no data would be taken that could put their identity and integrity at risk.

**Confidentiality:** The information obtained was handled only by the research team and will be used for educational purposes only.

**Ethics Committee Subpoena**

Excellent day. We are nursing graduates who are requesting submission of our research work to the ethics committee. The study is being conducted by **Lic. Pablo Jerson Espinoza Palma, Lic. Lester Fidel García Guzmán, Lic. Dulce María Oviedo Martínez,** Lic. Nathaly Valentina Conrado Flores, Lic. Eugenia Cristina Medrano Mendoza, Lic. **The study is entitled Eating Habits and Sedentary Behavior Related to Obesity in Intercity Transport Drivers in the West.**

Before giving your approval to participate in this study, it is important that you understand that this is a research project, intended to gather information for academic studies and conduct a study based on the eating habits and sedentary behavior of intercity bus drivers. Through closed-ended questions and an ethical and reliable approach to the opinions expressed by participants, it is also important to emphasize that the procedures performed will not be invasive. The only thing performed will be anthropometric measurements with a scale and a centimeter tape measure. This will allow us to interpret the data from the study population and, in the same way, prioritize the general and public health of the general population.

Signature of the Interested Parties:

**RESULTS**

The study, Eating Habits and Sedentary Behavior Related to Obesity in Intercity Transport Drivers, included a sample of 180 transport drivers, 90 of whom were cases and 90 of whom were controls. The results were as follows:

Regarding sociodemographic data: the mean age was 35 and the mode was 38. Marital status was 49% single and 51% married; 82% were from urban areas and 18% from rural areas; and, according to academic level, 1% were illiterate; 17% completed primary school, 61% completed secondary school, 20% completed university studies, and 2% completed higher education (Table 1).

**Table 1.** Sociodemographic data of intercity transporters

| Data | Sociodemographic | F | % |
|---|---|---|---|
| Age | Average | 35 | |
| | Fashion | 38 | |
| Marital status | Single | 89 | 49% |
| | Married | 91 | 51% |
| Origin | Urban | 148 | 82% |
| | Rural | 32 | 18% |
| Professional Level | Illiterate | 1 | 1% |
| | Primary | 30 | 16% |
| | Secondary | 109 | 61% |
| | University | 36 | 20% |
| | Higher Education | 3 | 2% |

**Source: Questionnaire**

**Eating habits associated with obesity in transporters**

**Table 2** In relation to the consumption of high-fat foods and obesity, it was found that 84 of the cases did consume fatty foods, with a result of $X^2$: 0.424, an OR of 0.651 and its lower natural limits of 0.177 and upper of 2.390 (Table 2).

| Foods high in fat | Obesity | | |
|---|---|---|---|
| | Yeah | No | Total |
| Yeah | 84 | 86 | 170 |
| No | 6 | 4 | 10 |
| Total | 90 | 90 | 180 |

**$X^2$:** 0.424 **OR:** 0.651 **Lni:** 0.177 **Lns:** 2.390

Regarding the frequency of consumption of high-fat foods, 12 cases were found to be eating poorly, with a result of $X^2$:1.910, an OR of 0.575 and its lower natural limits of 0.261 and upper natural limits of 1.268 (Table 3).

**Table 3.** Relationship between the frequency of consumption of high-fat foods and obesity in intercity transporters

| Frequency of consuming foods with high fat content | Cases | Obesity Controls | Total |
|---|---|---|---|
| Inappropriate | 12 | 19 | 31 |
| Appropriate | 78 | 71 | 149 |
| Total | 90 | 90 | 180 |

**$X^2$:** 1.910 **OR:** 0.575 **Lni:** 0.261 **Lns:** 1.268

In relation to the consumption of foods high in carbohydrates and obesity, it was found that 90 of the cases do consume foods high in carbohydrates, with a result of $X^2$: 1.006, an OR of 0.497 and its lower natural limits of 0.429 and upper of 0.576 (Table 4).

**Table 4.** Relationship between consuming foods high in carbohydrates and obesity in intercity transporters

| Foods high in carbohydrates | Cases | Obesity Controls | Total |
|---|---|---|---|
| Yeah | 90 | 89 | 179 |
| No | 0 | 1 | 1 |
| Total | 90 | 90 | 180 |

**$X^2$:** 1.006 **OR:** 0.497 **Lni:** 0.429 **Lns:** 0.576

**Table 5.** Relationship between the frequency of consumption of foods with high carbohydrate content and obesity in transporters

| Foods high in carbohydrates | Cases | Obesity Controls | Total |
|---|---|---|---|
| Yeah | 90 | 89 | 179 |
| No | 0 | 1 | 1 |
| Total | 90 | 90 | 180 |

In relation to the frequency of consumption of foods high in carbohydrates, 8 cases were found to be eating improperly, with a result of $X^2$: 4.496, an OR of 0.390 and its lower natural limits of 0.160 and upper of 0.951 (Table 5).

| Frequency of consuming foods high in carbohydrates | Cases | Obesity Controls | Total |
|---|---|---|---|
| Inappropriate | 8 | 18 | 26 |
| Appropriate | 82 | 72 | 154 |
| Total | 90 | 90 | 180 |

**$X^2$:** 4.496 **OR:** 0.390 **Lni:** 0.160 **Lns:** 0.951

In relation to water consumption during the working day and obesity, 88 cases were found that did drink water, with a result

of $X^2$: 0.690, an OR of 2.047 and its lower natural limits of 0.365 and upper of 11.465 (Table 5).

**Table 6.** Relationship between drinking water during the working day and obesity in intercity transporters

| Drink water | Cases | Controls | Total |
|---|---|---|---|
| Yeah | 88 | 86 | 174 |
| No | 2 | 4 | 6 |
| Total | 90 | 90 | 180 |

**X²:** 0.690 **OR:** 2.047 **Lni:** 0.365 **Lns:** 11.46

In the relationship with the frequency of drinking water during the working day and obesity, 8 cases were found that do not drink water frequently, with a result of $X^2$: 0.746, an OR of 1.659 and its lower natural limits 0.521 and upper 5.729 (Table 6).

**Table 6.** Relationship between the frequency of drinking water during the working day and obesity in intercity transporters

| Frequency of drinking water | Cases | Obesity Controls | Total |
|---|---|---|---|
| Infrequent | 8 | 5 | 13 |
| Frequent | 82 | 85 | 167 |
| Total | 90 | 90 | 180 |

**X²:** 0.746 **OR:** 1.659 **Lni:** 0.521 **Lns:** 5.72

In the relationship between eating three meals a day and obesity, 80 cases were found that, if they consume food three times a day, with a result of $X^2$: 0.585, an OR of 0.675 and its lower natural limits 0.245 and upper 1.859 (Table 7).

**Table 7.** Relationship between eating three meals a day and obesity in intercity transporters

| Three meals a day | Cases | Obesity Controls | Total |
|---|---|---|---|
| Yeah | 80 | 83 | 163 |
| No | 10 | 7 | 17 |
| Total | 90 | 90 | 180 |

**X²:** 0.585 **OR:** 0.675 **Lni:** 0.245 **Lns:** 1.859

In relation to the consumption of two snacks a day and obesity, it was found that 45 cases did consume snacks twice a day, with a result of $X^2$: 8.396, an OR of 0.406 and its lower natural limits of 0.220 and upper of 0.752 (Table 8).

**Table 8.** Relationship between snacking twice a day and obesity in intercity transporters

| Daily snacks | Cases | Controls | Total |
|---|---|---|---|
| Yeah | 45 | 64 | 109 |
| No | 45 | 26 | 71 |
| Total | 90 | 90 | 180 |

**X²:** 8.396 **OR:** 0.406 **Lni:** 0.220 **Lns:** 0.75

In relation to the consumption of energy drinks and obesity, it was found that 58 cases did consume energy drinks, with a result of $X^2$: 4.536, an OR of 1.734 and its natural lower limits of 0.954 and upper limits of 3.151 (Table 9).

**Table 9.** Relationship between energy drink consumption and obesity in intercity transporters

| Consume energy drinks | Cases | Obesity Controls | Total |
|---|---|---|---|
| Yeah | 58 | 46 | 104 |
| No | 32 | 44 | 76 |
| Total | 90 | 90 | 180 |

**X²:** 4.536 **OR:** 1.734 **Lni:** 0.954 **Lns:** 3.151

In relation to the frequency of taking energy drinks and obesity, it was found that 38 of the cases frequently consume energy drinks, with a result of $X^2$: 0.370, an OR 1.204 and its lower natural limits 0.662 and upper 2.187 (Table 10).

**Table 10.** Relationship between the frequency of taking energy drinks and obesity in intercity transporters

| Frequency of consuming energy drinks | Cases | Obesity Controls | Total |
|---|---|---|---|
| Frequent | 38 | 34 | 72 |
| Infrequent | 52 | 56 | 108 |
| Total | 90 | 90 | 180 |

**X²:** 0.370 **OR:** 1.204 **Lni:** 0.662 **Lns:** 2.187

In relation to the type of energy drinks and obesity, it was found that 28 of the cases consume these drinks that are inadequate, with a result of $X^2$: 1.951, an OR of 0.647 and its lower natural limits 0.351 and upper 1.194 (Table 11).

**Table 11.** Relationship between the type of energy drink and obesity in intercity transporters

| Type of energy drink | Cases | Controls | Total |
|---|---|---|---|
| Inappropriate | 28 | 37 | 65 |
| Appropriate | 62 | 53 | 115 |
| Total | 90 | 90 | 180 |

**X²:** 1.951 **OR:** 0.647 **Lni:** 0.351 **Lns:** 1.194

Relationship between consuming food outside their home and obesity, it was found that 70 of the cases consume food outside their home, with a result of $X^2$: 4,000, an OR of 0.438 and its lower natural limits of 0.192 and upper of 0.997 (Table 12).

**Table 12.** Relationship between eating outside the home and obesity in intercity transporters

| Eating food outside your home | Cases | Obesity Controls | Total |
|---|---|---|---|
| Yeah | 70 | 80 | 150 |
| No | 20 | 10 | 30 |
| Total | 90 | 90 | 180 |

**X²:** 4.000 **OR:** 0.438 **Lni:** 0.192 **Lns:** 0.997

In relation to the frequency of consuming food outside the home and obesity, it was found that 55 of the cases frequently consumed food outside the home, with a result of $X^2$: 0.214, an OR of 0.867 and its lower natural limits of 0.474 and upper limits of 1.587 (Table 13).

**Table 13.** Relationship between the frequency of food consumption outside the home and obesity in intercity transporters

| Frequency of Eating Outside Your Home | Cases | Obesity Controls | Total |
|---|---|---|---|
| Yeah | 70 | 80 | 150 |
| No | 20 | 10 | 30 |
| Total | 90 | 90 | 180 |

**X²:** 0.214 **OR:** 0.867 **Lni:** 0.474 **Lns:** 1.587

**Sedentary behaviors associated with obesity in transporters**

In relation to whether you remain seated for more than 4 hours during your workday and obesity, it was found that 50 of the cases remain seated for more than 4 hours, with a result of $X^2$: 1.090, an OR of 1.366 and its lower natural limits of 0.760 and upper of 2.456 (Table 14).

**Table 14.** Relationship between remaining seated for more than 4 hours during the workday and obesity in intercity transporters

| More than 4 Hours Sitting | Cases | Obesity Controls | Total |
|---|---|---|---|
| Yeah | 50 | 43 | 93 |
| No | 40 | 47 | 87 |
| Total | 90 | 90 | 180 |

**X²:** 1.090 **OR:** 1.366 **Lni:** 0.760 **Lns:** 2.456

Relationship between physical activities and obesity, it was found that 59 of the cases did perform some physical activity, with a result of X²: 0.025, an OR of 0.952 and its lower natural limits of 0.513 and upper limits of 1.764 (Table 15).

**Table 15.** Relationship between physical activity and obesity in intercity transporters

| Physical Activity | Cases | Obesity Controls | Total |
|---|---|---|---|
| Yeah | 59 | 60 | 119 |
| No | 31 | 30 | 61 |
| Total | 90 | 90 | 180 |

**X²:** 0.025 **OR:** 0.952 **Lni:** 0.513 **Lns:** 1.764

In relation to the type of physical activity and obesity, it was found that 43 of the cases perform physical activity, but in an inadequate manner, with a result of X²: 0.356, an OR of 0.837 and its lower natural limits of 0.466 and upper limits of 1.502 (Table 16).

**Table 16.** Relationship between type of physical activity and obesity in intercity transporters

| Type of Physical Activity | Cases | Obesity Controls | Total |
|---|---|---|---|
| Inadequate | 43 | 47 | 90 |
| Adequate | 47 | 43 | 90 |
| Total | 90 | 90 | 180 |

**X²:** 0.356 **OR:** 0.837 **Lni:** 0.466 **Lns:** 1.502

Relationship between walking +30 minutes daily and obesity, it was found that 45 of the cases walk less than -30 minutes daily, with a result of X²: 0.022, an OR of 0.957 and its lower natural limits of 0.533 and upper of 1.716 (Table 17).

**Table 17.** Relationship between daily walks and obesity in intercity transporters

| Daily Walks | Cases | Obesity Controls | Total |
|---|---|---|---|
| -30 | 43 | 47 | 90 |
| 30 | 47 | 43 | 90 |
| Total | 90 | 90 | 180 |

**X²:** 0.022 **OR:** 0.957 **Lni:** 0.533 **Lns:** 1.716

In relation to the activities they carry out in their free time during the working day and obesity, it was found that 43 carry out inappropriate activities, with a result of X²: 0.200, an OR of 0.875 and its lower natural limits of 0.488 and upper limits of 1.570 (Table 18).

**Table 18.** Relationship between activities carried out in their free time during their working day and obesity in intercity transporters

| Activities during the Working Day | Cases | Obesity Controls | Total |
|---|---|---|---|
| Inadequate | 43 | 46 | 89 |
| Adequate | 47 | 44 | 91 |
| Total | 90 | 90 | 180 |

**X²:** 0.200 **OR:** 0.875 **Lni:** 0.488 **Lns:** 1.570

Relationship with the means of transport in which they move and obesity it was found that 66 of the cases are moved in an inadequate means of transport, with a result of X²: 1.659, an OR 1.517 and its natural limits lower 0.803 and upper 2.866 (Table 19).

**Table 19.** Means of transport in which they move and obesity in intercity transporters

| Means of Transport | Cases | Obesity Controls | Total |
|---|---|---|---|
| Inadequate | 66 | 58 | 124 |
| Adequate | 24 | 32 | 56 |
| Total | 90 | 90 | 180 |

**X²:** 1.659 **OR:** 1.517 **Lni:** 0.803 **Lns:** 2.866

Relationship with the way of exercising and obesity it was found that 16 of the cases consider that the way they exercise is adequate, with a result of X²: 7.273, an OR of 0.392 and its lower natural limits of 0.196 and upper of 0.783 (Table 20).

**Table 20.** Relationship between the way of exercising and obesity in intercity transporters

| Way to Exercise | Cases | Obesity Controls | Total |
|---|---|---|---|
| Adequate | 16 | 32 | 48 |
| Inadequate | 74 | 58 | 132 |
| Total | 90 | 90 | 180 |

**X²:** 7.273 **OR:** 0.392 **Lni:** 0.196 **Lns:** 0.783

## DISCUSSION

Regarding the sociodemographic data of the population studied, it was observed that obesity in transporters is more common in the 32 to 38 age range, with a mode of 38 years; in marital status, married transporters predominate, those from urban backgrounds, and those with secondary education predominate in academic level [11-19].

When measuring the causal relationship between eating habits and sedentary behavior related to obesity in transporters, it was found that there is a perfect association of variables, it is a risk factor that increases the probability of getting sick up to 1,081 times and it is a variable that has statistical significance, this affirms Hinojosa Andia, Lucy J and Berrocal Kasay (2020) evidence that the incidence is increasing due to environmental and genetic factors, this is the cause of excessive consumption of nutrients and sedentary lifestyle, this being the main cause of the rapid acceleration of obesity in society [20].

• **Eating Habits Related to Obesity**

When measuring the causal relationship between the consumption of foods with high fat content and obesity, an association of variables was found. It is a protective factor that reduces the probability of getting sick by 0.651 times, a statistically significant fact, which contradicts what Valeria proposed. Carrasco (2020) in which he states that bad eating habits begin with simple aspects, this includes an excessive intake of fat, due to long working hours and this is why they are forced to consume food in quantity rather than quality, and this being the poor choice of food at the time of consumption [21-30].

Regarding the causal relationship between the frequency

of consuming foods with high fat content and obesity, it was found that there is no association of variables, it is a protective factor that decreases up to 0.575 times the probability of getting sick and is a value that has statistical significance, which is why it contradicts José Ramos (2017) in which he states that choosing healthy fats of vegetable origin more frequently instead of less healthy fats of animal origin will help reduce the risk of suffering a heart attack, stroke and other major health problems [28-39].

When measuring the causal relationship between the consumption of foods with high carbohydrate content and obesity, it was found that there is no association of variables, it is a protective factor that reduces the probability of getting sick up to 0.497 times and is a value that has statistical significance, which is why it contradicts Marta Esperanza Fonseca (2014) shows that the amount of nutrients required by humans is already established, but that each person's activity and lifestyle require careful selection of what food to obtain, and in what quantity and time. This is especially important for public transport drivers, who tend to sit in their cars for an average of 16 hours.

Regarding the causal relationship between the frequency of consuming foods high in carbohydrates and obesity, it was found that there is no association between variables. It is a risk factor that reduces the probability of getting sick up to 0.390 times and is a value that has statistical significance, which is why it contradicts Carlos José Martínez (2017), who recommends that the best foods with carbohydrate content are those that are of natural origin and that are ingested in a balanced way [40].

When measuring the causal relationship between drinking water during the work day and obesity, it was found that there is no association between the variables. It is a risk factor that increases the probability of getting sick by 2,047 times and is a value that does not have statistical significance, which contradicts Valeria. Carrasco (2020) In which he states that water is the element that can best help a driver's physical condition, so that he can maintain his reaction capacity, attention and concentration.

Regarding the causal relationship between the frequency of drinking water during the workday and obesity, it was found that there is no association between the variables. It is a risk factor that increases the probability of getting sick up to 1,659 times and is a value that does not have statistical

significance, which is why it contradicts Manolo Francisco Gonzales (2016) in which he expresses that the amount of water consumed by intercity transporters is little or none, deteriorating the quality of work during the day, which is why they recommend always carrying a bottle of natural water in the vehicle for proper hydration and durability during the workday [32].

When measuring the causal relationship between the three daily meal times and obesity, it was found that there is no association, it is a protective factor that decreases the probability of getting sick up to 0.675 times and being a value that does not have statistical significance, which is why it contradicts Manolo Francisco Gonzales (2016) in which he states that three meals a day should be made, breakfast time, this has to be very complete. Thus, it has to include four different food groups: dairy products, cereals, fruits or vegetables and supplements (oils and fats, meats and derivatives, sweets, etc.) [32].

When measuring the causal relationship between the two snacks a day and obesity, it was found that there is no association of variables, it is a protective factor that reduces the probability of getting sick up to 0.406 times and being a value that does not have statistical significance, which is why it contradicts Bryan Adrián Charro Bosmediano (2020) in which he shows that to have a snack there should be established schedules for intake, taking into account the proportion of these, and the nutrients they provide, these should be consumed two hours before lunchtime and two hours before dinner [31].

When measuring the causal relationship between the consumption of energy drinks and obesity, it was found that there is no association of variables, it is a risk factor that increases the probability of getting sick up to 1,734 times and being a value that does not have statistical significance, which is why it contradicts Manolo Francisco Gonzales (2016) shows that intercity transporters consume small quantities of water, they prefer to drink energy or sugary drinks that make their system active all day, but at the same time slowly deteriorate the body [32].

Regarding the causal relationship between the frequency of consuming energy drinks and obesity, it was found that there is an association of the variable, which is a risk factor that increases the probability of getting sick up to 1,204 times and is a value that does not have statistical significance,

which is why it contradicts Manolo Francisco Gonzales (2016) who states that the frequent consumption of drinks with high sugar content or energy drinks with non-natural content increases the probability of cardiac arrest and liver deterioration when consumed very frequently [32].

When measuring the causal relationship between the types of energy drinks and obesity, it was found that there is no association of variables, which is a protective factor that decreases the probability of getting sick up to 0.647 times and is a value that does not have statistical significance, which contradicts Manolo Francisco Gonzales (2016) who states that there are unhealthy and healthy types of energy drinks, with bottled drinks being the ones that cause the most damage to the body [32].

When measuring the causal relationship between eating outside the home and obesity, it was found that there is no association between the variables, which is a protective factor that reduces the probability of getting sick up to 0.438 times and is a value that has statistical significance, which contradicts Juan Manolo Gonzales (2018) It shows that there are several factors that influence drivers to eat outside the home, among the most important being long work days, which makes it difficult to go home to eat; this person consumes high-calorie foods and junk food in general, taking into account that it is more convenient for drivers to opt for this type of food outside the home.

Regarding the relationship between the frequency of eating outside the home and obesity, it was found that there is an association of variables, which is a protective factor that decreases the probability of getting sick up to 0.867 times, being a value that does not have statistical significance, which contradicts Juan Manolo Gonzales (2018) expresses that he does not frequently consume food outside his home, due to the excessive amount of calories and poor hygiene in fast food restaurants [34].

- **Sedentary behaviors associated with obesity in transporters**

When measuring the causal relationship between remaining seated for more than 4 hours and obesity, it was found that there is no association between variables, which is a risk factor that increases the probability of getting sick up to 1,366 times and is a value that does not have statistical significance, which contradicts José Carlos Fonseca (2020)

who says that Behaviors that involve sitting or lying down (but not standing) for more than four hours per day and occur in the workplace (paid or unpaid), travel, and leisure time. Time spent engaging in these behaviors is considered sedentary time [36].

When measuring the causal relationship between physical activities and obesity, it was found that there is an association of the variable, which is a protective factor that reduces the probability of getting sick up to 0.952 times and is a value that does not have statistical significance, which contradicts José Carlos Fonseca (2020) who says that physical activity has proven to be effective in the primary and secondary prevention of numerous chronic diseases such as cardiovascular diseases, diabetes, certain types of cancer, hypertension, obesity, depression and osteoporosis [36].

Regarding the relationship between the type of physical activity and obesity, it was found that there is an association of the variable, which is a protective factor that reduces the probability of getting sick up to 0.837 times and is a value that does not have statistical significance, which contradicts José Carlos Fonseca (2020) says that regular and frequent physical exercise stimulates the immune system, helping to prevent coronary heart disease, cardiovascular disease, type 2 diabetes, and obesity. It also improves mental health, helps prevent depression, develops and maintains self-esteem, and even increases libido and improves body image [36].

When measuring the relationship between walking +30 minutes daily and obesity, it was found that there is an association of variables, which is a protective factor that reduces the probability of getting sick up to 0.957 times and is a value that does not have statistical significance, which contradicts Miguel Pareja López (2020) who recommends walking 30 minutes a day, as this benefits your activity level and gives you a break of about 300 calories. It also helps prevent brain shrinkage, preserves memory, and reduces the risk of senile dementia by up to 40%.

Regarding the causal relationship between the activities you perform during the work day and obesity, it was found that there is an association of variables, which is a protective factor that reduces the probability of getting sick up to 0.875 times and is a value that does not have statistical significance, which is why it contradicts Fanny Zeledón (2013). It is a set of occupations to which the individual can engage completely voluntarily after being released from his obligations; the

transporter uses this free time to eat, sleep, listen to music, clean the transport unit, and chat with his coworkers.

When measuring the causal relationship between the means of transport used and obesity, it was found that there is no association between the variables, which is a risk factor that increases the probability of getting sick up to 1,517 times and being a value that does not have statistical significance, which is why it contradicts Fanny Zeledón (2013) who says that the best means of transport that exists is walking, she recommends doing it every day for 30 minutes to improve circulation, avoid chronic diseases and obesity [38].

When measuring the causal relationship between the way in which transporters exercise and obesity, it was found that there is no association between the variables, which is a protective factor that decreases the probability of getting sick up to 0.392 times and is a value that has statistical significance, which is why it contradicts Carlos Antonio Flowers (2017) Who says that when starting a physical exercise activity you should be aware of your own physical limitations and choose a sport that does not overburden your body [40-42].

## CONCLUSION

### 1.     Sociodemographic data

The study, carried out with a sample of 180 transporters, of which 90 transporters were cases and 90 transporters were controls, within these the mode for age is 38 and the mean 35, the most prevalent sex is male, they are married, the schooling of the transporters is secondary and the majority of these are from urban origin in the city of León.

### 2.   In relation to the variable Eating habits related to obesity, it was obtained that:

a)   An association was found between the consumption of high-fat foods and obesity, a protective factor that reduces the likelihood of illness by 0.651 times. High-fat foods are less edible for drivers, making them less likely to develop the disease.

b)   Regarding the consumption of foods high in carbohydrates and obesity, it was found that this risk factor reduces the likelihood of becoming ill by up to 0.390 times, and that carriers who consume foods high in carbohydrates promote weight gain.

c)   On the other hand, the consumption of energy drinks is

a risk factor that increases the likelihood of getting sick by up to 1,204 times, which puts drivers who consume these drinks at greater risk of obesity.

### 3.   In relation to the variable Sedentary behaviors related to obesity, it was obtained that:

a)   Regarding the relationship between physical activity and obesity, an association was found between variables where the possibility of contracting the disease is up to 0.955 times.

b)   In relation to daily walks and obesity, an association was found between variables where the possibility of developing the disease is up to 0.957 times.

c)   Sitting for more than four hours a day and obesity were found to be risk factors that increase the likelihood of getting sick by up to 1,366 times. Prolonged sitting and limited physical activity increase the risk of developing obesity.

d)   Regarding transportation mode and obesity, it was found that it is a risk factor that increases the likelihood of getting sick up to 1,517 times, since these people travel in their own vehicles, which causes them to walk less and engage in little physical activity, resulting in detrimental effects on their health.

In conclusion, we can say that our study population exhibits some risk behaviors related to obesity, considering that these individuals exhibit eating habits and sedentary behaviors that can affect their health and the quality of life of the transporters.

## RECOMMENDATIONS

**Addressed to the authorities of intercity transport cooperatives:**

•   Conduct training on the importance of proper eating habits and exercise.

•   Organize an event to promote health and provide medical checkups to transporters.

•   Provide information in pamphlets about appropriate physical activities that can be performed during the workday.

**To carriers:**

•   Engage in recreational activities that encourage physical activity, such as walking.

- Dedicate time to preparing your meals at home, emphasizing the consumption of fruits and vegetables, and reducing the consumption of foods high in calories and carbohydrates.

- Encourage people to drink water throughout the workday and thus eliminate energy drink consumption.

**To future researchers:**

It is recommended to continue research on eating habits and sedentary behavior in transporters, delving deeper into the topic.

Properly and efficiently manage the data provided by this research for further investigation, as it is the first to be conducted based on eating habits and sedentary behavior in Western transporters.

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