

Possible Title*

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Abstract

Introduction: hi

Objective: hi **Methods:** hi

Results: hi

Conclusion: hi

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Introduction

The World Health Organization (WHO) defines obesity as a chronic and intricate disease characterized by an accumulation of excess fat that poses significant health risks. This condition is not confined to isolated cases but has become alarmingly prevalent across numerous countries worldwide, warranting recognition as a global pandemic (CITE PAPER1). Among its many complications, obesity significantly elevates the risk of various health issues, including diabetes, fatty liver disease, hypertension, cardiovascular events like heart attacks and strokes, cognitive decline, joint ailments such as osteoarthritis, disrupted sleep patterns due to conditions like obstructive sleep apnea, and an increased susceptibility to certain types of cancer (CITE PAPER1).

Literature suggests that the likelihood of obesity is influenced by a range of factors beyond individual characteristics, including demographic attributes, community infrastructure, socioeconomic conditions, and specific environmental factors within communities (CITE PAPER 2). In certain countries, particularly among lower socioeconomic groups, obesity rates have surged dramatically due to urbanization, shifts in diet and food availability, and reduced physical activity. This rise in obesity is linked to a significant increase in mortality from chronic diseases like type 2 diabetes, heart disease, and certain cancers, potentially shortening life expectancy by up to 20 years. Given the preventable nature of obesity and its associated health risks, early detection is crucial to mitigate the development of serious conditions such as cardiovascular issues, diabetes, and asthma. Obesity's complex origins involve various factors including socioeconomic status, occupation, and lifestyle habits like smoking and physical activity levels. Physical activity and eating habits are key in preventing obesity, as it primarily stems from an imbalance between calories consumed and expended. Weight loss typically involves reducing calorie intake, increasing energy expenditure, or both. When individuals consume more energy than needed, the excess is stored as fat, leading to obesity. Therefore, maintaining a healthy weight relies on a balanced diet and regular physical activity. (CITE PAPER3)

This work is centered in identifying determinants associated with obesity, with particular emphasis on exploring the interplay between socioeconomic indicators and lifestyle behaviors. In Latin American obesity rates have reached alarming levels, posing serious health risks and placing a substantial burden on healthcare systems CITE(paper4). Therefore this work will address the global health issue of obesity, with a specific focus on

*Replication files are available on the author's Github account (<https://github.com/MCV20/GLM-project.git>). **Current version:** April 23, 2024

Table 1: Variable Description

Variable	Description	Values
Nobeyesdad	Obesity Level	Insufficient/Normal ObesityI/ObesityII ObesityIII/OverweightI/OverweightII
Gender	What is your gender?	Female/Male
Age	What is your age?	Numeric Value
Height	What is your height?	Numeric Value (m)
Weight	What is your weight?	Numeric Value (kg)
family_history_with_overweight	Has a family member suffered or suffers from overweight?	Yes/No
FAVC	Do you eat high caloric food frequently?	Yes/No
FCVC	Do you usually eat vegetables in your meals?	Never/Sometimes/Always
NCP	How many main meals do you have daily?	Numeric Value
CAEC	Do you eat any food between meals?	No/Sometimes/Frequently Always
Smoker	Do you smoke	Yes/No
CH20	How much water do you drink daily	Numeric Value
SCC	Do you monitor the calories you eat daily	Yes/No
FAF	How often do you do physical activity	Numeric Value
TUE	How much time do you use technological devices such as cell phone, videogames, television, computer and others?	Numeric Value
CALC	How often do you drink alcohol	Never/Sometimes/ Frequently/Always
MTRANS	Which transportation do you usually use	Automobile/Motorbike Bike/Public/Walking

the diverse populations of Mexico, Peru, and Colombia. By examining individuals' eating habits and physical condition, this research aims to understand the factors contributing to obesity prevalence in these regions and understand the underlying mechanisms driving the escalating rates of obesity.

Methodology

Data

The dataset, accessible online at the UC Irvine Machine Learning Repository, includes information pertinent to estimating obesity levels among ($n = 411$) individuals aged 14 to 61 hailing from Mexico, Peru, and Colombia. Collected via a web-based survey administered to anonymous respondents, the dataset comprises 17 attributes and was available online for a duration of 30 days. Data collection involved posing questions as delineated in Table 1, which also details the variables under study and the methodology employed in the data collection process.

Data Pre-processing

Given the relatively modest sample size of our dataset, we anticipate potential challenges in conducting robust analyses. Our outcome variables comprise seven distinct levels, encompassing three tiers of obesity (Type I, II, III), two tiers of overweight (I, II), as well as normal weight and underweight categories. However, certain categories contain a limited number of individuals, necessitating the consolidation of some for better statistical reliability. Accordingly, we introduce a novel class termed “Obese,” which consolidates the three levels of obesity, alongside a separate class denoted as “Overweight,” housing the two levels thereof, while retaining the remaining categories unchanged. Furthermore, certain categories within the covariates exhibited minimal representation, with some even lacking individuals in certain categories. Consequently, we undertook additional aggregation of these classes. For instance, within the alcohol consumption variable, we combined the “always” and “frequently” classes into a singular category. Similarly, in the transportation variable, we merged “motorbike” and “automobile” into a consolidated class termed “motor vehicle,” while amalgamating “walking” and “bike” into a unified category.

Statistical Modeling

Results

Descriptive Statistics

Model Results

Model Diagnostics

Discussion

Code Appendix

References