

## Research Article

# Family Factors Associated with Obesity in School Children of a Primary Care Center in Tijuana, Mexico

Cardenas-Lopez LV\*, Vidal-Solorzano LC, Bermúdez-Villalpando VI, González-Acosta JF, Palacio-Díaz DA and Flores-Escutia M

Department of Family Medicine, Family Medicine Unit #27 (IMSS), Baja California Delegation, Mexico

\*Corresponding author: Cardenas-Lopez Luciano Vidal, Department of Family Medicine, Family Medicine Unit #27 (IMSS), Baja California Delegation, México

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## Abstract

**Background:** Obesity and its complications have reduced life expectancy in Mexico and the world. The family environment is a factor of multiple diseases, there are many studies that show that the adversity of the family environment, socioeconomic status and behavioral status are associated with psychopathological problems such as childhood obesity.

**Objective:** To determine the family factors associated with obesity in school children of the Family Medicine Unit #27 (FMU 27), Tijuana, Mexico.

**Methods:** A case-control study was carried out to identify family factors associated with childhood obesity in schoolchildren, through the application of the following instruments: Family Adaptability and Cohesion Evaluation Scale (FACES III) for family functionality; Graffar-Méndez method for socioeconomic status and classification of body mass index (BMI) according to WHO tables. In the bivariate analysis, odds ratio and Chi-square with a 95% confidence interval were used, a  $p < 0.05$  was considered significant.

**Results:** Two groups were established (with and without obesity), with a case: control ratio of 1:3. Within the group with obesity, 73 (92%) participants had family dysfunctionality and in the group without obesity, 110 (51%) had family dysfunction. A statistically significant association was found between these two variables ( $p < 0.05$ ).

**Conclusions:** The increase of children with obesity in our country is worrying, so we must initiate an adequate health promotion in which it includes the evaluation of family functionality, which can help to carry out interventions and guide to solve their crises.

**Keywords:** Family; Pediatric Obesity; Family Functionality

## Introduction

Obesity is a chronic disease of multifactorial origin involving genetic, behavioral and environmental factors [1]. During the twentieth century there is the transition in morbidity and mortality of the population, from infectious to chronic diseases. This transition is due to social, economic and public health changes in which there is an excessive positive balance of caloric intake among the population. Family interaction is a factor associated with diseases, a problem derived from this adverse environment is childhood obesity [2]. The family is the basis of society, its characteristic is unity and it is the greatest influence that affects the development and growth of children, their ties are defined by affinity or blood relations [3-5].

The family is characterized by being dynamic and constantly evolving. The functional family is the one that manages to promote the integral development of its members. A dysfunctional family is one in which their actions lead to discomfort to the members, affecting their health and causing obesity, which leads to a greater risk of isolation and physical or psychological aggressions towards children [6-8]. Obesity is a systemic, chronic, progressive and multifactorial disease that is defined as an abnormal or excessive accumulation of fat. It can be said that obesity is the result of an imbalance between energy intake and energy expenditure, which can begin in childhood. Obesity

is a serious problem for any country and even more to developing countries like Mexico [9].

Globally, the number of children with obesity has increased, the prevalence exceeds 30% [10]. The national prevalence of overweight and obesity in schoolchildren was 20% and 15%, a higher frequency than in previous years [11]. Studies in Tijuana found that 24% of school children suffered from obesity and 5% extreme obesity [12]. In other studies conducted in the northern part of the country, it was obtained that 30% of schoolchildren were obese [13]. In Sonora, the psychological affectation relationship with nutritional status was evaluated, with a prevalence of 24% in obesity [14]. In Guadalajara, family dysfunction was assessed as a risk factor for obesity, 52% of schoolchildren with obesity belonged to dysfunctional families [15-17]. Based on above, the objective of the research was to determine the family factors associated with obesity in school children of the Family Medicine Unit # 27, Tijuana, Mexico.

## Methods

### Study design and population

A case-control study was carried out in Tijuana, Baja California, Mexico, between October and December 2019. The research was carried out in the family medicine unit #27 (FMU #27) of the Instituto

Mexicano del Seguro Social (IMSS); main center of health care in the region. Patients of school age (6-12 years) who agreed to participate in the study by informed consent and informed consent by parents were included.

### Variables

Two groups were formed (with and without obesity) according to their nutritional status. Weight and height were measured to plot the body mass index according to the Z score of the World Health Organization tables, it was staged in percentiles, considering obesity a percentile equal to or greater than 95. The Scale was applied to parents of Family Adaptability and Cohesion Evaluation Scale (FACES III) to determine family functionality, which has a Cronbach's alpha 0.70, has 20 self-answering questions [18]. The socioeconomic level was measured according to the Graffar-Méndez Castellanos scale that ranks from stratum I (upper class people) to stratum V (critical poverty), with a reliability coefficient of 0.85.

### Statistical analysis

In the qualitative variables we use frequencies and percentages; for quantitative variables, median and interquartile range. The normality test was performed using the Kolmogorov-Smirnov test. Chi-square analysis was performed to test the differences in the categorical variables and the odds ratio was used to calculate the relative risk. The results were evaluated in a 95% confidence interval, a  $p < 0.05$  was considered significant. For data analysis, the IBM SPSS program, version 20 (Armonk, NY, USA) was used.

### Ethics

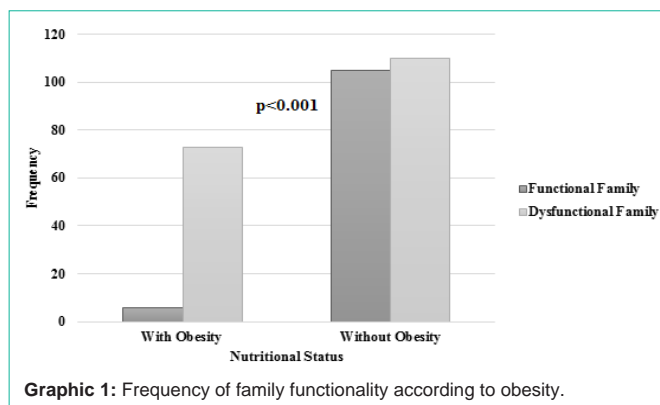
The study was approved by the local health ethics and research committee number 204; with registration number R-2019-204-021. The research was conducted under bioethical principles, the general health law in health research and the Helsinki declaration. The parents of the minors signed the informed consent and the participants the informed consent.

### Results

294 patients aged 6 to 11 years of FMU #27 were included. They were divided into 2 groups for cases and controls, 79 patients within the case group and 215 in controls. A case: control ratio of 1:3 was established. Within the group with obesity, 73 (92%) participants had family dysfunctionality and in the group without obesity, 110 (51%) had family dysfunction. A statistically significant association was found between these two variables (Graphic 1). In the family typology of the case group, 12 (15%) families were non-nuclear families and 67 (85%) nuclear families. In the socioeconomic level of the case group, 5 (6%) had a low average level and 74 (94%) worker level. When performing the bivariate analysis, we found a statistically significant relationship between obesity and family dysfunction (OR=11.6, 95% CI 4.8-27.8,  $p < 0.001$ ).

### Discussion and Conclusion

The most important finding of our research was the high prevalence of the diagnosis of obesity and family dysfunctionality in school age. The metabolic disease that occurs with the highest prevalence, both in developed and underdeveloped countries, is obesity. It is estimated that, worldwide, about 22 million children under the age of five are overweight. Of the countries of Latin



Graphic 1: Frequency of family functionality according to obesity.

America, Mexico has the highest prevalence of obesity in children, reaching approximately 20%. The region with the highest affected child population is Mexico City with 38% [19].

Bacardi-Gascón in his study in Tijuana, observed that 24% of school children suffered from obesity and 5% extreme obesity [12], this information is similar to our study. In the association between family dysfunction and obesity, González-Rico (2012) reported that 52% of patients suffering from obesity belonged to dysfunctional families [15], in our population 92% of patients with obesity had dysfunctional families; family dysfunction is a very important risk factor for the development of obesity that can continue to adulthood and help trigger chronic degenerative diseases and their complications.

The evaluation of family functionality should be considered part of the comprehensive approach of patients with obesity, knowing the family environment allows a more precise orientation on the crises that the family is going through and guides on the presence of emotional disorders such as anxiety, depression or stress, entities present in dysfunctional families [20-21]. Clinical practice guidelines propose physical activity, the reduction of television hours and breastfeeding as the method of infant feeding of choice as preventive action for obesity. In the case of treatment, it is proposed the early identification of obesity and overweight and should be treated immediately, it should not be postponed to adolescence or adulthood, the recommended non-pharmacological measures are diet modification, increase of physical activity, decrease in sedentary activity, family participation and behavior modification, psychological support is important; Pharmacological or surgical measures such as the use of metformin, orlistat and bariatric surgery are recommended after adolescence [22].

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