



# MATERNAL EATING BEHAVIOR ASSOCIATED WITH BODY COMPOSITION OF THE ADOLESCENT SON IN THE POPULATION OF ALLENDE-MEXICO

CONDUCTA ALIMENTARIA MATERNA ASOCIADA A LA COMPOSICIÓN CORPORAL DEL HIJO ADOLESCENTE EN LA POBLACIÓN DE ALLENDE-MÉXICO

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## ABSTRACT

**Introduction:** Appetite traits (RA) are part of the eating behavior of the person, with a series of continuous responses that are related to the choice and consumption of food, but also to aspects at the moment in which the feeding is carried out, the frequency of meals, the place, the company with which they are shared, among others. These factors can have a significant impact on the way a person eats and on their long-term health. **Objective:** To analyze the possible connection between maternal eating behavior and the body composition of the adolescent, from a high school in the city of Allende, Nuevo León, in Mexico. **Method:** A quantitative, cross-sectional and correlational study was carried out. The period of the present study was February-August 2022, the population was 41 couples (mother and adolescent son between 15 and 17 years old), from a high school in the municipality of Allende, Nuevo León, Mexico. To test the hypothesis, Spearman's correlation coefficient was obtained. **Results:** When running the statistical test, it was found that there is no significant correlation between the level of eating behavior of the mother and the body composition of the adolescent ( $r_s = -0.174, p = 0.277$ ), therefore, the hypothesis of investigation. **Conclusions:** It was found that the eating behavior of the mother is not significantly related to the body composition of the adolescents with the sample considered in the present study.

**Keywords:** Eating behavior; obesity; body composition. (Source: MESH-NLM)

## RESUMEN

**Introducción:** Los rasgos del apetito (RA) forman parte de la conducta alimentaria de la persona, con una serie de respuestas continuas que se relaciona con la elección y consumo de alimentos y, también, con aspectos al momento en que se realiza la alimentación como son la frecuencia de las comidas, el lugar, la compañía con la que se comparten, entre otros. Estos factores pueden tener un impacto significativo en la forma en que se alimenta una persona y en su salud a largo plazo. **Objetivo:** Analizar la posible asociación entre la conducta alimentaria materna y la composición corporal del adolescente, de una preparatoria de la ciudad de Allende, Nuevo León, en México. **Método:** Se realizó un estudio cuantitativo, transversal y correlacional. El periodo del presente estudio fue de febrero a agosto de 2022. La población fue de 41 binomios (madre e hijo adolescente entre 15 y 17 años) de una preparatoria del municipio de Allende, Nuevo León, México. Para probar la hipótesis, se utilizó el coeficiente de correlación de Spearman. **Resultados:** Al correr la prueba estadística se encontró que no existe una correlación significativa entre el nivel de conducta alimentaria de la madre y la composición corporal del adolescente ( $r_s = -0,174, p = 0,277$ ), por lo cual se rechaza la hipótesis de investigación. **Conclusiones:** Se encontró que la conducta alimentaria de la madre no se relaciona significativamente con la composición corporal del adolescente, de acuerdo a la muestra considerada en el presente estudio.

**Palabras clave:** Comportamiento alimentario; obesidad; composición corporal. (Fuente: DeCS- BIREME)

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## INTRODUCTION

Eating behavior is defined as normal behavior related to eating habits, food selection, culinary preparations, and the amounts eaten. In human beings, the ways of eating, preferences and rejections towards certain foods are strongly conditioned by learning and the experiences lived in the first five years of life. In general, the child incorporates most of the eating habits and practices of a community before that age. However, the mother has a fundamental role in educating and transmitting dietary guidelines to the child, so the delivery of preventive educational content must be focused on her so that diseases related to altered eating behaviors (food rejections, obesity, diabetes, dyslipidemia, anorexia nervosa). Therefore, the present study sought to analyze the possible association between maternal eating behavior and the adolescent's body composition from a high school in the city of Allende, Nuevo León, Mexico. The background of the study is described below.

## BACKGROUND

### Appetite trait

#### Concept

It is the desire to eat. Appetite is the process of choosing and eating food related to the genetic-hereditary area, whose characteristics can be recognized from the first years of life through various behaviors<sup>(1,2)</sup>. When talking about the traits of appetite, it refers to a constant tendency towards food<sup>(3)</sup>. In this same sense, when an individual is susceptible or does not control their appetites, they are at risk of entering the field of developing obesity<sup>(4-6)</sup>. González<sup>(7)</sup> comments that appetite is a psychological desire to eat, since it is related to sensory experiences, and the inhibition of eating when the digestive system stops is considered a feeling of satiety.

### Feeding behavior

According to Gorab<sup>(7)</sup>, feeding behavior is related to eating habits, food choices, culinary preparations and amounts consumed. This is due to the interaction of factors such as the physiology of appetite and satiety,

sociocultural, family and appetite disorders<sup>(7)</sup>.

Eating behavior is a behavior that a person performs concerning eating habits<sup>(8)</sup>, these behaviors can cause negative eating styles that put human health at risk<sup>(9)</sup>. Generally, these behaviors are caused by maintaining a slim physical figure in the face of the demands of society<sup>(10)</sup>.

Currently, eating behavior is considered to be a severe health problem worldwide and covers all ages. However, this problem is more common in young women<sup>(11)</sup>. On this idea, it is pointed out that most women, to avoid rejection by society, avoid consuming calories and thus preserve their physical condition<sup>(12)</sup>. This eating behavior causes them to lose their average weight excessively, which causes migraines, fatigue and anger, among others<sup>(13)</sup>.

Eating behavior is characterized by excessive food intake and the use of meal replacement products that can lead to obesity<sup>(14)</sup>. In a study on the control of obesity, it was found that 53.6% of patients had eating behavior problems<sup>(15)</sup>; in another study, it was found that, in patients with obesity controls, 20.6% showed abnormal eating behaviors<sup>(16)</sup>. Furthermore, being overweight in childhood is one of the most relevant factors for adult eating behaviour<sup>(17,18)</sup>. In addition, problematic eating patterns at an early age are associated with eating behavior<sup>(19)</sup>.

### Adolescent body composition

According to Kaufer-Horwitz<sup>(20)</sup>, overweight (OW) and obesity (OB) represent a public health problem and have been shown to be the result of accelerated changes in food demand, including changes in lifestyle. Torres<sup>(21)</sup> says that in society interactions with communities and food shape the reality of what future exposure to food will be like. In other words, adult customs and traditions are behaviors children can refer to in their adult lives. Childhood OW and OB are considered highly relevant public health problems. There are 40 million children globally with OW and OB, multifactorial chronic health conditions involving genetic susceptibility and lifestyles<sup>(22)</sup>.



Shamah-Levy<sup>(23)</sup> points out that Mexico is the country with the highest prevalence of overweight and obesity worldwide, since 34.4% of children and 35% of adolescents are obese and overweight, taking into account that these children have an 80% chance of that in their adult life they remain obese or develop a preventable disease problem. At present, OB and OW are diseases that are increasingly present in the lives of Mexicans. If the adolescent population is considered, 38.5% have some level of OW or OB<sup>(24)</sup>.

Childhood and adolescent OB is recognized as a global public health problem, that increases the risk of chronic non-communicable diseases, such as type 2 diabetes and hypertension, and has a high social cost. To measure and classify adolescents as OW, a body mass index (BMI) (kg/m<sup>2</sup>) between 25.0 and 29.9 is considered obese if the BMI is equal to or greater than 30<sup>(25)</sup>. That is why it is necessary to educate in good nutrition, which means discovering and eradicating beliefs, myths, and destructive behaviors. It is necessary to improve or change the eating habits of all members of the educational community: children, parents, teachers and managers. It is necessary to understand that the life and health of children depend on what they eat every day<sup>(26)</sup>.

## RELATIONSHIP BETWEEN VARIABLES

### Maternal eating behavior and child eating behavior

There are some family factors that act as predisposing and influencing children's eating behaviors<sup>(27)</sup>. It was found that the family's behavior significantly impacts the children's eating behavior, whether it is to lead a healthy life or not<sup>(27)</sup>. In this sense, Campo<sup>(28)</sup> mentions a link between environmental factors and leading a healthy lifestyle. In this regard, Krug<sup>(29)</sup> points out that predispositions to eating behaviors are acquired during childhood. Studies show that parental attitudes and behaviors toward food significantly predict children's later eating problems<sup>(29,30)</sup>.

Besides, dependence on alcohol and other substances in families is related to patients with eating behaviors<sup>(31)</sup>. In addition, it is pointed out that the comments and ridicule that the individual may receive about their weight and physical appearance at home impact their body image and can be reflected in symptoms of eating behaviors<sup>(32)</sup>.

### Maternal feeding behavior and body composition

Mothers adopt their care and feeding habits early, so their weight seems to influence the weight and feeding of their children<sup>(33)</sup>. In addition, problems related to weight, shape, and eating are also often transmitted from parents to children, especially from mother to daughter<sup>(32)</sup>. Henderson<sup>(34)</sup> reveals a clear link between mothers' experiences, children's weight, and mealtime conflicts.

Additionally, it is established that the diet of the girls is closely related to the diet of the mothers, since they are the ones who introduce the food and choose the forms of consumption and the eating habits of the parents and the dissatisfaction with their own is correlated with the children's diet<sup>(35)</sup>.

## METHOD

### Design

A quantitative, observational, cross-sectional study was carried out.

### Population and sample

The study population was the mother-son pairs of a high school in Allende, Nuevo León, Mexico, in May 2022. A non-probabilistic sampling was carried out for convenience, selecting the participants by group and hours of the class of sports. In addition, they were informed of the benefits and the data collected would be used for a final project of a subject, and this way everyone could participate. To participate in the study, girls inform their mothers about the project, share a printed brochure with their mothers, access a digitally signed informed consent form, and complete the AEBQ-Esp survey electronically. A total of 41 mother-child pairs participated in the study.

### Variables and instruments

Eating behavior was evaluated in both mothers and children. The Appetite Traits Questionnaire (AEBQ-ESP) adapted to Spanish by Eva Morales, was used to assess the mother's eating behavior<sup>(36)</sup>, this questionnaire is made up of 30 items that measure seven dimensions. Three dimensions are related to pro-intake (response to food, enjoyment of food, and emotional overeating)

and four to anti-food intake (satiety response, emotional undereating, picky attitude, and slow eating) To assess the adolescent's eating behavior, the Appetite Traits Questionnaire (CEBQ-ESP) was used.

The questionnaire comprises 35 items, with eight dimensions, of which three are related to pro-ingestion (response to food, enjoyment of food and emotional overeating) and five to anti-eating. foods that are satiety responses, emotional malnutrition, picky attitude, slow eating, and desire to drink. In both questionnaires, the response categories are on a 5-option Likert scale, where one corresponds to *disagree* and 5 to *to agree strongly*. To obtain an estimate of each dimension of the questionnaires, the sum of the items included is made, obtaining the total score of each one. Both eating behavior questionnaires were validated and adapted to the Spanish language <sup>(36)</sup>. The internal consistency through Cronbach's alpha for the AEBQ-ESP is 0.86 and for the CEBQ-ESP it is 0.797.

In the case of the children, the body composition was evaluated through the BMI, the percentage of body fat and the percentage of visceral fat. The percentage of fat was obtained using the electrical bioimpedance scale (InBody Dial). Sociodemographic information was obtained from both the son and the mother, such as: age, sex of the son, educational level, and occupation of the mother.

### Statistical analysis

An exploratory analysis of the data was carried out, obtaining descriptive statistics. For the numerical variables, the arithmetic mean and standard deviation were obtained. To carry out the hypothesis tests, the

normality of the data was first evaluated using the Shapiro Wilk test. When it was found that the data did not follow a normal distribution ( $p < 0.05$ ), the association between the mother's eating behaviors and body composition was evaluated using Spearman's Rho test. Data analysis was performed using Jamovi 2.3.22 statistical software.

### Ethical aspects

In the development of the investigative process, an informed consent was made to safeguard the privacy of all the participants in the surveys carried out. All the supports and foundations of the investigation were recognized, as well as the copyright of each of the contributors. The information the participants provided to the study was kept strictly confidential and used only by the project's research team and is not available for any other purpose. All participants were coded with a number, and their names were not used, so they cannot be identified. Study participants did not receive any payment for participating in the research nor did it imply any cost to them. The study was carried out in accordance with the Declaration of Helsinki, Edinburgh 2000 and the current General Health Law on research for health: in Second Title, Chapter I, Article 17, the study is considered to be of minimal risk, since the survey that has no risk on their psychological health.

### RESULTS

The arithmetic mean of the mothers' eating behavior level was 2.6 and the standard deviation of 0.48; for the level of eating behavior of the adolescents an arithmetic mean of 2.8 and a standard deviation of 0.46 was obtained. Table 1 shows the arithmetic means and the standard deviation of the dimensions of the variable eating behaviors of the mothers.

**Table 1.** Descriptors of the dimensions of the eating behaviors of the mothers.

Acronym	Dimensions	M	SD
EF	Enjoy Food	4.1	0.78
FF	Fussy attitude	3.3	0.53
SE	Slow to Eat	2.7	0.70



SR	Satiety Responses	2.4	0.88
EUE	Emotional underfeeding	2.3	0.94
FR	Food Response	2.2	1.02
EOE	Emotional overeating	2.0	0.91

Table 2 shows the arithmetic means and the standard deviation of the dimensions of the adolescent eating behaviors variable.

According to the table, the best-evaluated size was "Enjoyment of food" and the least evaluated dimension was "Response to food".

**Table 2.** Descriptive dimensions of adolescent eating behaviors.

Acronym	Dimensions	M	SD
FR	Food Response	2.2	1.05
EF	Enjoy Food	4.3	0.72
EOE	Emotional overeating	2.3	0.88
SR	Satiety Responses	2.4	0.51
EUE	Emotional underfeeding	2.9	1.07
FF	Fussy attitude	3.3	0.53
SE	Slow to Eat	2.7	0.70
DB	Desire to drink	2.3	1.06

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Table 3 shows the behavior of the demographic variables. In general, it is observed that the respondents

have a body mass index between low *weight* and *obesity*.

**Table 3.** Descriptors of the demographic variables of the children

	Age	Height	Weight	Body composition	% fat	Classification % fat	Visceral fat	Fat classification
Mean	15.36	163.43	64.03	23.79	30.48	2.73	9.04	2.39
Median	15.00	162.00	59.30	23.00	31.90	3.00	9.00	2.00
SD	0.736	8.52	16.41	5.27	10.97	0.54	5.10	0.58
Minimum	15.00	147.00	45.50	16.40	11.00	1.00	1.00	1.00
Maximum	17.00	184.00	137.00	47.40	50.60	3.00	20.00	3.00

**Hypothesis testing**

Before testing the hypothesis, the Shapiro-Wilk normality test ( $p > 0.05$ ) fue menor a 0.05 ( $p = 0.04$ ) por lo cual se asume que las variables no se distribuyen en forma normal.  $p$  was less than 0.05 ( $p = 0.04$ ) pwhich is why it is assumed that the variables are not normally

distributed.

The study hypothesis was the following: there is a significant association between maternal eating behavior and the body composition of the adolescent from a high school in the city of Allende, Nuevo León, Mexico.



To test the hypothesis, Spearman's correlation coefficient was used to determine if there is a significant association between the variables level of eating behavior of the mother and the adolescent's body composition. When running the statistical test, it was

found that there is no significant correlation ( $r_s = -0.174$ ,  $p = 0.277$ ) (see Figure 1) between the level of eating behavior of the mother and the body composition of the adolescent in the population studied. Therefore, the research hypothesis is rejected.

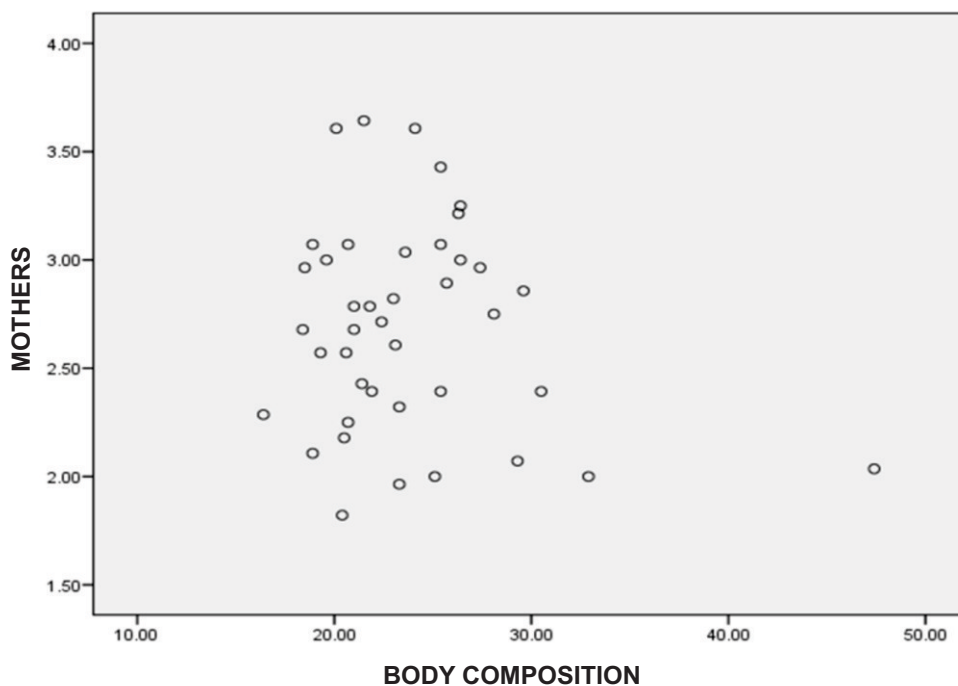


Figure 1. Scatterplot.

### Other analyzes

A relationship was sought between the variable appetite traits (AR) of the mother's eating behavior, the percentage of fat, and the weight of the adolescents. No significant relationship was found for having a p value greater than 0.05. A significant positive relationship was found between the mother's eating behavior and the adolescent's eating behavior ( $r_s = 0.436$ ,  $p = 0.004$ ).

A significant relationship was found between the mother's level of behavior and the response to food (RF) ( $r_s = 0.347$ ,  $p = 0.026$ ); A relationship was also found with the satiety response (SR) ( $r_s = 0.335$ ,  $p = 0.032$ ) In addition, a relationship was found with emotional malnutrition (EUE) ( $r_s = 0.392$ ,  $p = 0.011$ ). Se halló relación con actitud remilgosa (FF) ( $r = 0.476$ ,  $p = 0.002$ ) and a medium relationship with slow eating (SE) ( $r = 0.375$ ,  $p = 0.016$ ). No significant relationship was found with the other dimensions. When looking for differences between gender and the eating behavior of the mother and child, no differences were found difference significant ( $p = 0.753$ ). Both men and women have the same level of perception about the eating behavior.

### Statistical power

The G\*Power was obtained to calculate the statistical power of the correlations; the G\*Power<sup>(37)</sup> was obtained from a free statistical program used to calculate the statistical power and the effect size. A post hoc analysis was made for having applied the measurement instruments. To calculate the statistical power, an  $\alpha = 0.05$  and a sample of 41 binomials was obtained. A coefficient of determination of  $R^2$  de 0.436 was obtained. When calculating the statistical power, a value of 0.83 was found, one can be sure that in 83% ( $1 - \beta = 0.83$ ) that the statistical decision to reject the null hypothesis is also in the population the null hypothesis it is false.

### DISCUSSION

This study aimed to determine if the eating behavior trait of mothers has a significant relationship with the body composition of adolescents and mothers from a high school in the city of Allende, Nuevo León, Mexico. When running the statistical test, no significant



correlation was found between the level of the mother's eating behavior and the adolescent's body composition. Although when running the statistical test of the evaluation between the variables of the psychometric instrument of eating behavior of mothers (AEBQ-ESP) and adolescents (CEBQ-ESP), a significant correlation was found between the level of eating behavior of the mother and the level of adolescent eating behavior. These results agree with some previous studies where it is pointed out that mothers adopt their care and feeding habits early, so maternal eating behavior seems to influence the weight and feeding of their children<sup>(33)</sup>. In addition, BMI, shape, and eating issues are often passed down from parent to child, especially mother to daughter<sup>(32)</sup>. Henderson<sup>(34)</sup> reveals a clear link between mothers' experiences, children's weight, and Conflicts at mealtime. Additionally, it is established that the diet of the girls is closely related to the diet of the mothers, since they are the ones who introduce the food and choose the forms of consumption, the eating habits of the parents and the dissatisfaction with their own is correlated with the children's diet<sup>(35)</sup>.

## CONCLUSION

In the sample of mothers and adolescents from a high

school in the city of Allende, Nuevo León, Mexico, it was found that the mother's eating behavior level is not associated with the body composition of the adolescent. It means that the eating behavior of the mother has no association with the body composition of her children in the studied population. The increase in the body composition of the children could be caused by other factors not studied in the present investigation, such as the intake of foods with high caloric content.

A significant association was found when measuring the variables of the psychometric instrument that evaluated the eating behavior of mothers (AEBQ-ESP) and adolescents (CEBQ-ESP). It is important to elucidate that, if there is a direct significant weight between eating behavior traits between mothers and adolescent children, it follows from the study that when mothers have pro-eating or anti-eating behaviors their children will develop them equally in his teenage life. As a recommendation, it can be added that the importance of food education towards mothers is plethora so that they transmit it, teach their children in their first years of life, and remain omnipresent in their future life.

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