

Eating habits in mexican schooled children

Hábitos alimenticios en niños escolares mexicanos

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SUMMARY

In Mexico, 35.5% of school-age children are overweight or obese, the main cause of this excess is related to eating habits. A multivariate study was carried out to predict the eating habits of school children in function of social eating norms and perceived food advertising. Through random sampling, 132 girls and boys from upper primary were selected, to whom a questionnaire was applied to measure eating habits, food social norms, and perceived food advertising. As a result, in a model that predicts 36.5% of eating habits, the social norms to avoid ($\beta=0.368$, $P=0.001$) and the perceived food advertising that motivates the purchase ($\beta=0.243$, $P=0.011$) have a greater weight on it.

Which emphasizes the need to implement psychosocial interventions for the prevention of childhood obesity.

Keywords: *Eating habits, eating social norms, food advertising, health psychology*

RESUMEN

En México, el 35,5% de los niños en edad escolar tienen sobrepeso u obesidad, la principal causa de este exceso ponderal está relacionada con los hábitos alimentarios. Se realizó un estudio multivariado para predecir los hábitos alimentarios de los escolares en función de las normas sociales de alimentación y la publicidad alimentaria percibida. Mediante un muestreo aleatorio se seleccionaron 132 niñas y niños de primaria superior, a quienes se les aplicó un cuestionario para medir hábitos alimentarios, normas sociales alimentarias y publicidad alimentaria percibida. Como resultado, en un modelo que predice el 36,5% de los hábitos alimentarios, las normas sociales a evitar ($\beta=0,368$, $P=0,001$) y la publicidad de alimentos percibida que motiva la compra ($\beta=0,243$, $P=0,011$) tienen un mayor peso en él. Lo que enfatiza la necesidad de implementar intervenciones psicosociales para la prevención de la obesidad infantil.

Palabras clave: *Hábitos alimentarios, normas sociales alimentarias, publicidad alimentaria, psicología de la salud.*

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INTRODUCTION

Mexico is currently under an epidemiological

emergency declaration due to the magnitude and significance of cases of overweight and obesity, where 35.5 % of school-age children and 76.8 % of adults present this weight overload related to multiple diseases (1,2).

Obesity has caused a variety of health problems and risks for children in this country (3) and the strategies that have been used to combat this epidemic have been to increase physical activity, improve the labeling of the food and beverages that are sold, as well as having conferences and nutritional education. Regarding these strategies, although positive results have been seen in clinical practice settings, they have fallen short in reaching their goal, since it has been observed that the eating habits of minors at home and in educational institutions are not healthy (4).

Various conceptual models explain the increase in childhood obesity, among which are the Biopsychosocial Model (5), Ecological systems theory (6), the Six C's model (7) and the medically is the developmental cascade model of pediatric obesity (8). This article has an approach from Health Psychology, in company with the Biopsychosocial Model.

Eating habits are the main psychosocial factor related to overweight and obesity, which are the result of the automation of eating actions, which is eaten without an awareness filter (9) and it can be observed in group and collective behaviors regarding what, when, where, how, with what, for what and with whom food is consumed, these are carried out continuously and are built in the socio-cultural context of the individual in addition to their biological repertoire (10-12). Eating habits have become very important among health professionals due to their relationship with nutritional status, ceasing to be an exclusive issue for nutrition professionals given the bio-psychosocial characteristics of the variable.

During childhood and adolescence, nutrition is essential for growth and development, health, and general well-being. The eating habits developed during childhood are generally habits that are carried into adulthood and they contribute in the long term to the health and well-being of the individual, as well as helping to prevent the development of chronic degenerative diseases (13).

Although multiple factors influence eating behaviors and the development of eating habits, some of the factors that have been found relevant are the perception of what the group, peers, and society, in general, accept as "proper" eating behavior. Eating patterns also function as a means of interaction between individuals, thus allowing us to relate to people in our midst, since it consists of a specific feature of our society and culture, an example of this fact is when we sit down as a family during dinner, or on the festivities of each culture, that performs in the social alimentary norms (14).

Eating habits and Social Norms

The social norms are generally aspects of great influence in almost all the processes of the human being. Social norms are endorsed and declared rules that social groups establish, they can be of a moral or cultural nature, this facilitates the behavior of individuals or even making them more difficult at times (15).

Food social norms are standards perceived by others about what is an adequate diet, such as the quantity and choice of food for members of a social group. These are of powerful influence since following or not following a food social norm is associated with social judgments. These social judgments affect the choice and intake of food, altering the self-perception and evaluation of nutrition.

Evidence has been found where people, as social beings, use information about the eating behaviors of others as a guide about what is an appropriate behavior according to a specific context (16,17) it has also been reported that the behaviors of following a diet are related to the normative behavior perception among peers (18).

There are different reasons why people follow the social norms of food, one of them is that following this standard reinforces and helps the individual to feel identified and accepted with the social group, and the other is because following a norm is the result of eating what is right (19). Studies have concluded that concern for social acceptance affects and plays a very important role in shaping food consumption norms (20), what they found is that affective issues, such as self-esteem and empathy, as well

as the individual's need for social acceptance, influence the construction of the repertoire of eating behaviors. Many studies (21,22) have examined how individuals adjust their eating habits to improve their public image, and somehow make an impression on others and to fit in a stereotype.

The idea that social norms are important determinants for developing healthy eating habits has been widely accepted, since different investigations have been made where it is found that there is an important correlation between the social norms perceived and applied by the group with specific healthy behaviors, such as eating a healthy diet, exercising, consuming fruits and vegetables, consuming sugary drinks, and consuming fast food (23).

Eating habits and Advertising

With the rapid growth of technologies and the speed with which information is transmitted, an important relationship could be seen between the weight gain of infants and the time they spend watching television, because of this there has been an inadequate food intake and decrease in physical activity, television being one of the important platforms of food advertising, due to the time and accessibility that the child has access to television (24). However, with new technologies, social networks, smart devices, the impact of food advertising on children may be greater, resulting in the development of eating habits being negatively impacted (25).

Additionally, advertising influences which can be stated that is an important determinant for the sale of a product (26). It has been repeatedly seen that the persuasiveness of advertisements is such that laws and regulations have been created to ensure the well-being of others (27).

Since the objective of advertising is to attract attention and create a need for its consumption, food advertisements greatly affect children, who are vulnerable to developing overweight or obesity in the face of constant exposure to high-calorie food advertisements and low in nutrients (24). It has been found that the hypercaloric foods that are advertised to minors are not adequate for them to have a healthy and

optimal diet. Also, the food advertising strategies that are effective to offer the product use happy melodies, interesting colors, and characters of animation to attract the attention of the young public (27).

In this regard, Cobio and Alvarez (28) found that although children do not recognize the influence of television advertising on their diet, they are carried away by it as they crave the foods, mostly junk, that they advertise, and although they do not buy them or they rarely ask for them, parents tend to buy them these foods most of the time.

Some studies find that preschool and primary-age children prefer foods and beverages with a high percentage of saturated sugar and fat, and generally, this type of food is what children ask to buy; these preferences are influenced by their exposure to food advertising on television (29).

In this way, it is necessary to identify the aspects of the social context that influence the construction of these eating habits, especially in girls and boys since the Food and Agriculture Organization of the United States (30) emphasizes that both "mothers and husbands, families, community and professional advisers must understand that the life and future of their children depend on what they eat", evidencing the role of the family and the community is a fundamental aspect for the development of minors and therefore of society.

Although an increase in research about psychosocial factors that intervene in eating habits in Mexico has happened, focusing on aspects such as body image, the influence of parents, the school context, or nutritional status (28,31,32), just a few studies seek to explain the multi causality of the phenomenon, considering the main actors in the context of schoolchildren, that is, culture and advertising.

The impact of external aspects such as family, food social norms, and advertising influence the construction of eating habits, being important determinants in food intake, food preferences, time, and place for its consumption, and even the meaning that food has. Since the process of eating, as previously reviewed, is not only a physical process but also a social one allowing the children's eating habits to develop (33). This

has generated an important need, which could foresee the impact that established social norms about food and food advertising have on eating habits in school-aged children.

Therefore, it is necessary to identify how the television advertising for children and the social norms of their peers influence the eating habits of school-aged children, to develop interdisciplinary intervention programs in the future that consider the context in which the minor operates so that it is possible to work on the co-construction of healthier habits that are part of the community's lifestyle, not only of those who enter a food program.

This is the reason why this study is proposed to describe and elaborate a predictive model of the constructions of the eating habits of school children based on the social norms of food and the television advertising that serve to have a broader picture of how the phenomenon occurs, therefore, the study is developed to answer the research question: To what extent do social food norms and perceived food television advertising predict the eating habits of schoolchildren in Northeast Mexico?

METHOD

A descriptive, predictive, and cross-sectional quantitative study was carried out to predict the eating habits of school children based on food advertising and food social norms.

Participants

Through a probability and random sampling with a 95 % confidence interval, 132 primary school girls and boys were selected from a population of 220 girls and boys from the third to sixth grades of a public primary school in northeastern Mexico.

The inclusion criteria were that the children attended upper primary school (from 3rd to 6th grade) and that they had delivered the consents signed by their parents. Those who had had a health problem that affected their regular food consumption during the week were excluded before the application as well as the ones who did

not answer more than 5 % of the questionnaire.

Of the participants, 40.2 % were boys and 59.8 % were girls, with an average age of 9.83 years and a range between 8 and 12 years. Regarding the nutritional status, 7.57 % presented underweight, 49.24 % normal weight, 18.9 % overweight, and 24.24 % obesity.

Instruments

A section of sociodemographic data was used in which they were asked about age, sex, school grade, number of people with whom they live, and their relation. In this section, the anthropometric data of height and weight were also taken. For the calculation of nutritional status, the formula and percentile table for weight measurement in children 5 to 19 years old were used, according to their age, sex, and height, provided by the World Health Organization (34).

To measure eating habits was used the subscale of eating habits of the Questionnaire on Physical Activity and Eating Habits by Moral et al. (32), in its original version which measures the weekly frequency of food consumption in 28 items with a scale of 4 response options (0= I have not consumed it, 1= I have consumed it once a week, 3= I have consumed it 3 times a week, y 7= I have consumed it daily); additionally, in 16 items, openly answered the following information on the acquisition of food: who does the shopping, prepares the food, who they eat at home with, as well as the meal times and the total number of meals they eat during the day.

For the application in school children, the section on the frequency of food consumption was adapted to the total of portions consumed daily, presenting the children with images with the size of the portions of each food indicated and without using the 4 response options, but leaving it open to a numerical answer. This for children to reach the food consumption count in a simpler way, supported by reference images of the portions and foods established in the Food Guide for the Mexican Population (35). This modification was piloted with a convenience sample of 100 girls and boys of the same age range, obtaining an internal consistency coefficient of .892 for the subscale of frequency of food consumption and

of 0.872 for the subscale of acquisition of foods that did not have variations to the original format.

The scale of frequency of food consumption yields three scores; a raw score per food and a raw score per food group; vegetables, fruits, cereals, legumes, meats, dairy, water, sugars, and fats, which are grouped according to the official norm in the Food Guide for the Mexican Population of the Secretaría de Salud (35); and finally a standardized score of food consumption (insufficient, adequate or exceeded) according to the parameters regarding the portions for Mexican children of school age from 6 to 12 years of the Dietary and Physical Activity Guidelines of the Academia Nacional de Medicina (36).

To measure the television food advertising attended, the Advertising Perception Questionnaire by Cobio (28) was applied, which in 36 dichotomous answer option items, asks about the television commercials of food that children watch. In its validation with the population in northeastern Mexico, it obtained a reliability coefficient of 0.781. This Questionnaire gives a total score of the number of items that motivate them to buy the food they advertise.

Finally, to measure food social norms, the NAS was used (Pérez and López, in review). In 11 items, it asks about the social norms that regulate their eating, it is answered on a Likert scale of 5 options of the level of agreement (0 = disagree, 4 = Totally agree). In its validation for the population of northeast Mexico, a Cronbach's alpha of 0.762, a Test-Retest reliability of $r_2 = 0.892$, and a goodness of fit for two factors were obtained; rules to reproduce ($\alpha = 0.774$) and rules to avoid ($\alpha = 0.446$, GFI = 0.951, RMSEA = 0.059).

Procedure

Permits and consents were requested from 12 public elementary schools in the city of Saltillo, Coahuila, which was only approved by one. Following the approval, the informed consents were sent to the children's parents and returned the following day. When collecting the consents, their consent was requested, and the anonymity and confidentiality of their data were guaranteed.

The application was carried out in a guided and individual way in a room with a desk and chairs at

their school assigned exclusively for this activity, relying on the images of the real-size portions of the food printed on bond paper so that the children could hold them in their hands, with an average duration of one hour to respond to the full battery. In the case of 3rd-year children, it was necessary to do the application in 2 sessions of 40 and 20 minutes, to answer the questionnaire on eating habits in the first session and the second session the questionnaires on advertising perception and social norms food.

Analysis

The SPSS-25 statistical package was used for data processing, where we worked with parametric statistics given by the normality test ($KS > 0.05$) and the central limit theorem. Descriptive statistics of means and standard deviation were performed, as well as by frequencies and percentages, Pearson's correlation analysis, and multiple linear regression analysis by the introduction method, assuming the children's food consumption as a dependent variable.

RESULTS

Table 1 shows that, in general, children have insufficient consumption of vegetables (81.4 %), legumes (61.5 %), and fats (55.6 %), while the majority have an excess consumption of sugars (90.6 %), dairy (88.4 %), foods of animal origin (82 %), cereals (78.2 %), and fruits (56.6 %), with only water consumption being the one that occurs in most of them at a sufficient level in their consumption (68.9 %).

Regarding the description of the eating habits of schoolchildren, the total number of portions of food they consume in a day ($M=46.13$) and the average number of meals they eat outside the home ($M=3.44$) stand out. On the other hand, regarding food social norms, it was observed that they frequently identify with those that tell them how to behave in front of food ($M=4.19$), while they occasionally identify with the norms that tell them how not to behave when they eat ($M=3.54$). Finally, they averaged to receive an approximate total of 6 food advertising commercials that motivate them to buy the product they offer.

Table 1
Food consumption of children

Food consumption	Insufficient f%	Sufficient f%	Exceeded f%
Vegetables	105(81.4)	13(9.8)	11(8.3)
Fruits	17(13.2)	39(29.5)	73(56.6)
Cereals	11(8.9)	16(12.9)	97(78.2)
Legumes	80(61.5)	30(23.1)	20(15.4)
Foods of animal origin	6(4.7)	17(13.3)	105(82)
Dairy	7(5.4)	8(6.2)	114(88.4)
Water	24(18.2)	91(68.9)	17(12.9)
Sugar	4(3.1)	8(6.1)	116(90.6)
Fats	70(55.6)	21(16.7)	35(27.8)

Table 2 shows only the significant correlations between the eating habits and the social alimentary norms and the perceived food advertising that motives the purchase in schoolchildren. Resulting in that the greater the identification with the

social dietary norms, the less presence of the eating habits. The opposite occurs with perceived food advertising that is presented with a greater presence of eating habits.

Table 2
Correlations of eating habits, food social norms, and food advertising

	NSA-R	NSA-E	TNSA	PAP
Meals out of home				0.194*
Foods of animal origin	-0.196*	-0.177*	-0.216*	0.279**
Dairy				0.217*
Cereals	-0.203*	-0.270**	-0.287**	0.297**
Fats		-0.184*	-0.216*	0.275**
Sugar	-0.178*	-0.196*	-0.226*	
Water				0.298**
Total Consumption	-0.190*	-0.234*	-0.247**	0.276**

* ≤ 0.05 ; ** ≤ 0.01 ; NSA-R= Eating social norms to reproduce; NSA-E= Food social norms to avoid; TNSA= Total Food Social Norms; PAP= Perceived food advertising that motivates the purchase

Finally, in Table 3, the children's food consumption was predicted by 36.5 %. being the variables with greater significance weight the social norms to avoid ($\beta=0.368$) and the perceived food advertising that motivates the

purchase ($\beta=0.243$). In other words, the higher the level of agreement with the food standards that tell them what not to do with food and the more food publicity perceived by schoolchildren, the greater their food consumption during the day.

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Table 3
Prediction of food consumption in children

Independent variable	R ²	P	SC			CI Beta 95 %	
			Beta	t	p	Inf	Sup
Social norms to reproduce	0.365	0.0001	0.134	1.291	0.200	-.322	-.322
Social norms to avoid			0.368	3.611	0.001	.926	.926
Perceived food advertising that motivates the purchase			0.243	2.602	0.011	0.383	0.383
Meals out of home			0.118	1.255	0.213	-.810	-.810
Hours between meals			0.285	3.037	0.003	1.316	1.316
Number of meals a day			0.035	0.360	0.720	-1.888	-1.888

DISCUSSION

As shown, the eating habits of the participating children are not the most appropriate according to the recommendations of the Secretaría de Salud (35) and the Academia Nacional de Medicina (36), even though they have a high consumption of fruits, cereals, foods of animal origin, dairy and sugars that are translated mostly in breakfasts such as cereals sweetened with milk or yogurt with cookies; lunches and dinners based on fast food such as pizzas, hamburgers or tacos accompanied by sugary drinks. This is also reflected in the times they eat away from home, which points to the consumption of food in fast food franchises, as mentioned by Wolfson et al. (37) regarding that these restaurants are part of the new lifestyles of modern families, where there are two working parents with less and less time to prepare meals.

Although the consumption of fruits is recommended for their high content of vitamins and minerals and the consumption of dairy products and foods of animal origin for their contribution of calcium and proteins, it is also recommended that these are consumed in the less processed possible way and that they do not exceed the normative portions by age group, since this is related to the development of obesity (36), as observed in this sample, where 43.14 % of has overweight or obesity, being above the national average.

On the other hand, it turned out that social food norms, specifically those that tell them what not to do in front of food, such as avoiding raising their elbows to the table, avoiding eating between meals, and reducing meals outside the home, as well as food advertising predict higher food consumption in children.

This was striking since it contrasts with what was found by Ball et al. (30), who stated that the more social food norms they assume, the better health habits in people. However, to understand this disagreement, it is necessary to remember what Higgs (23) referred to, regarding the fact that these social norms are constructed in the observation of social behaviors in a food context, rather than in health norms or medical guidelines regarding food portion size and food regulation. So, the fact that these social food norms are built in the culture of a country that ranks first in childhood obesity, and the first in overweight in adults (2) influences these health standards far from bringing them closer to the regulation of health, brings them closer to acceptance and social belonging (18,19).

Food advertising aims to provoke the purchase and consumption of food products, although there are many different market objectives, children are one of the age groups to whom a large number of messages of this nature are directed, being the television one of the main media through which they perceive this advertising (24,27). Advertising promotes the consumption of hypercaloric foods and fast food (25,28), which

could explain what was mentioned above regarding consumption in fast food franchises with meals such as hamburgers, pizzas, hot dogs, and tacos.

Likewise, according to Pérez (22), the consumption of these advertised foods becomes more affordable given the modern family dynamics that grants and promote the consumption of fast and hypercaloric food to a greater extent, as this favors the busy lifestyle of the city, compensates for the absence of parents and is partly influenced by the constructions that exist, especially in northern Mexico, where an Americanized culture is assumed. This normalizes their consumption, and it becomes perceived as healthy while providing a social status by the implication of purchasing power.

It can be concluded that children's eating habits are unhealthy, as they consume cereals, dairy products, foods of animal origin, and sugars excessively, in addition to frequently eating outside the home.

Likewise, it is realized that children regularly identify with food social norms and that they perceive that there are television commercials that motivate them to buy the food they advertise.

Finally, it can be said that both variables; social food norms and perceived food advertising predict higher children's food consumption in northeastern Mexico.

The above points to the importance of including these psychosocial factors, where phenomena of representation of the food reality, identity, belonging, and social status are involved, in intervention programs for the prevention of childhood obesity.

As noted above, the strategies to reduce the epidemic that Mexico faces, child overweight and obesity, have not yielded the expected result, since year after year the prevalence continues to increase, and in part, it may be since these and other variables of a psychosocial nature are not being considered that can trigger problems such as stigma, bullying, and therefore affect the mental health of the infant.

On the other hand, the limitations of the study were the size of the sample and its lack of representation for children from northeast Mexico, as well as not having included children

who are in the first years of school, to establish the differences between the children in who attend initial primary and upper primary.

In this way, it is recommended to continue in the study of these psychological and social factors related to health, considering the factors that emerged with respect to parental and family influence, accessibility to food, especially fast food and economic factors, as well as the constructions that children and parents have regarding the food regulatory norms established by health professionals, food preferences and the influence of peers, mainly in children.

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