

## Habits of consumption of fruits and vegetables in Mexican adolescents and their relationship with eating disorder

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### Abstract

This descriptive information intended to know the habits and preferences of some foods in Mexican adolescents, in addition to the benefits and barriers of adolescents to the consumption of fruits and vegetables and their association with overweight and obesity in adolescents. In the study of dietary patterns of the National Health and Nutrition Examination Survey, 2006 to 2012 and Survey teens to IMSS, dietary patterns were identified in Mexican adolescents. On the other hand the concern of the adolescent population fatten forces us to think about the influence of the prevailing aesthetic model in today's society and internalize it. It is known that concern about body weight is one of the variables of higher risk and can lead to disordered eating behavior. In short if the teen integrate within their usual diet group frutassegún vegetables and adequate intake recommendations, would help adolescents to have less weight and health problems, given the high percentage of water, fiber, low densidadenergética and contribution vitamins and minerals containing this group slowing in a sense the onset of eating disorder.

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## Introduction

## Adolescence

The word comes from the Latin *adolescens* is the active ingredient or present verb *adolescere*, it means to grow, to increase. Precisely liabilities and past participle of the same verb is *adultus*, which means "grown up" the already finished growing. The onset of adolescence has in the biological definition of sexual maturity (puberty), adolescent becomes an adult when it becomes financially and emotionally independent of their families. The World Health Organization (WHO) is an international organization that sets health policies in the countries and defines adolescence as the period population group between 10 and 19 years old. The group is between 15 and 24 defines it as youngsters. If we add the age groups between 10 and 24, they represent 30% of the total Latin American population.

Psychosocial development understand the process of progressive differentiation of the central nervous system that allows the acquisition of motor, language, cognitive and social empowering the individual to function normally within the family and society.

Classification of adolescence (Cecilia Silva 2007):

- Early (10-14 years old)
- Media (15-17 years old)
- Late and young adults (18-24 years old)

## Psychosocial development in early adolescence (10-14 years):

### Independence

- Lack of interest in family activity

- Changes in mood.

### Body Image

- Importance of appearance
- Importance of fashion

### Adoption of new lifestyles

They generally have friends of the same gender. Identity

The relationship with others helps them take their characteristics for the development of their personality; have fantasies, they need privacy, all of which is derived from a process of internal reflection we call cognitive thinking.

## Psychosocial development in middle adolescence (15 a 17 años) (Silva Cecilia 2007):

### Independence

- They have family conflicts
- Testing of the learned values.

### Body Image

- Concern about appearance

### Adoption of new lifestyles

- Sense of belonging or affinity groups or with their peers.
- We give great importance to the values of the group of friends.
- Begin heterosexual dating

**Identity**

- Intellectual ability
- Shared Feelings.

**Psychosocial development in late adolescence (18-21 years and even up to 24 years) (Cecilia Silva 2007):**

**Independence**

- Acceptance of responsibility
- Acceptance of advice.

**Body Image**

- Acceptance of your image.

**Adoption of new lifestyles**

- Expanding your groups
- Using and managing your time.

**Identity****Manifest a vocation****Set realistic commitments.**

Accepted moral, religious and sexual values MEXICO adolescent population (ENSANUT 2012)

While there is a group of relatively healthy old who has already passed the critical stage of the mortality and morbidity of childhood, and still does not face the problems of adulthood, adolescents contribute more proportionally to their weight population health conditions that result from behaviors that compromise their present and future welfare.

By following the definition of the previous surveys and according to international consensus adolescents comprise individuals from 10-19 years old. During the teens 21519 ENSANUT which together accounted for 22,804,083 estimated as residents in Mexico in 2012. This population equivalent to 20.2% of the people in this country were interviewed. Of that total, 50.3% are men and 49.7% women, which show a trend of higher percentage of women, it believes that the ENSANUT 2006 the percentage was 49.2%. The size of the adolescent population represents a decrease of 0.3% in relation to the size of the group in 2006 ENSANUT.

**Eating disorders in adolescents (ENSANUT 2012)**

The proportion of adolescents (10-19 years) at risk of having an eating behavior disorder was 1.3% (1.9% in females and 0.8% in males).

The proportion of adolescents at risk of having an eating disorder was half a percentage point higher in 2012 ENSANUT recorded in 2006. The data reported in the ENSANUT 2012 (Gutierrez et al., 2012) showed that the frequently dietary risk behaviors among Mexican adolescents (10-19) years were: concerns about fat, eat too much and lose control over what you eat. In both sexes we found that fasting, dieting, taking pills, laxatives or diuretics in order to lose weight was the most frequent risk behavior.

When comparing age groups, males 14 to 19 years had a higher prevalence of risk behaviors, such as eating too much and exercising, that of 10-13 years.

Teenagers 14 to 19 years had a higher prevalence of all eating disorder (except induce vomiting) that adolescents aged 10 to 13 years.

In the National Health Survey in school (ENSE (Shamma-Levy, 2010)) reports that preteens 10 years at 8% indicated a feeling of not being able to have control, to eat, and 0.7% practiced vomiting self-induced, 3% performing compensation practices such as fasting or excessive exercise with the intention to lose weight, just as 10% of schools had an inadequate eating behavior in the three months prior to implementation of the survey.

### **Eating habits of adolescents.**

#### **Definition of terms**

Eating habits: set of behaviors acquired by an individual, by the repetition of acts in the selection, preparation and consumption of food. Healthy eating habits: eating behaviors repeat in which we bring a lot of energy and nutrients needed for our age and daily activity, sufficient to protect the nutritional needs (R. Tapia 2005).

#### **Feeding Adolescents Power**

Food in Mexico City varies according to socioeconomic strata. In particular the concept of health is related to the concerns of different groups in the upper strata has to do with nature and with different groups: in high strata has to do with the nature and care of the image, while in the lower strata associated with the health and satiety, as opposed to hunger.

Furthermore the modification of diet due to socio-cultural changes, from the internal point of view that is, in their homes individuals develop habits and food preferences and households choose their food mainly on the market, or convenience stores, given that they are no longer cultivated. Eating habits and nutrition of adolescents are affected by snacks or drinks they buy in schools or near them, as may prefer them over traditional foods prepared at home.

They tend to be more tasteless, less sweet and fatty foods preferring innovative product of globalization, like fast food.

Obviously, food prices are non-core, also shape or distort the election, as the public adjusts its tastes and cultural budget constraints preferences and seeks diets that are affordable, filling and satisfactory elsewhere, where industrialized foods fill a nutritional niche. Increasingly they offer basic food options as tortillas, breads and pastas.

Processed foods also provide concentrated through fat snack foods and sugars in sodas energy. We know that eating plenty of these products contribute to overweight, obesity and chronic diseases, and may also contribute to malnutrition, because it distracts the appetite that could lead to energy consumed through foods also provide other nutrients.

Lack of time is also a factor in the selection of food away from home; it may be that while adolescents face between an obligation and other students to choose the products they sell in the shop, you get and consume more quickly, rather than a more nutritious food, such as those that have only an hour for power; in these conditions, acquisition, preparation, consumption and cleanup are time constraints that severely reduce the nutritious options. The work schedule interferes with parent family meals, with traditional communication and healthy eating habits, with pleasure and sociability to food and nutrition and individual health generational? Does it happen in Mexico that specific meals throughout the day are spacing?

#### **Macronutrient intake in teens**

In a survey of adolescents (10-14años), all beneficiaries of the Mexican Social Security Institute (IMSS).

The consumption of sweets, soft drinks, juices and pastries was 30.1, 27.1, 21.1 and 13.8%, while teenagers 15 to 19 years the percentages were in the same order, 30.3, 28.6, 20.2 and 12.5%. (Jimenez Cruz, et al 2002)

The information provided in the National Youth Survey 2005 (Perichart O. Pereda, 2007) tells us that 29% of adolescents 12 to 14 years taking soft drinks daily, 30% ate sweet snacks, salty snacks 24% and 11% consuming calls "fast food"; in adolescents aged 15 to 19 were observed frequencies of 36.0, 24.4, 23.5 and 120% according to the same order.

In the same sense teens in California in ninth grade the frequency of consumption of fruits is at least two servings of fruit per day was 20% and eating at least three servings of vegetables was 47% and IMSS beneficiaries of the study (Flores Huerta S, et al 2006) in the group of 10 to 14 years 35.7% of the subjects reported consuming fruit daily and 19.1% consumed vegetables; among 15- to 19 frequencies consumption of these foods was 35.0 and 20.4%, respectively.

### **Barriers and Benefits of consumption of fruits and vegetables**

Given the benefits of eating fruits and vegetables it is important to identify factors that motivate or impede such consumption, especially in adolescence. Studies on this subject have been based on the Transtheoretical Model of Prochaska, particularly on the pros and cons (Di Noia, et al., 2006)

There is little research on the consumption of fruits and vegetables by adolescents. These studies carried out on samples of developed countries, they showed no difference in the perceived benefits by gender.

Men think it gives them more energy while women favoring their physical appearance; another group said that fruits and vegetables are healthy foods that improve school performance, physical fitness and self-esteem. (Di Noia, et al., 2006).

Other research that considers the theoretical constructs of benefits and barriers, focus healthy eating behavior in the adult population. (López-Azpiazu I. et al., 1999).

Also in Mexico in the northern states of the republic (Matamoros Tamaulipas), among which is Tamaulipas, they are characterized by low consumption of fruits and vegetables; no published studies documenting exactly the benefits and barriers perceived by adolescents to include these foods in their diet and this issue has not been explored in Mexican adolescent population. For both a scale is used to determine benefits and barriers for adolescents to the consumption of fruits and vegetables they vary according to gender.

The main benefit for the consumption of fruits and vegetables for males was "take care of my health by eating fruits and vegetables" and the female was "I like the taste of fruits and vegetables."

The benefit with the lowest score was the fact that consumption of fruits and vegetables help to have a lower chance of developing cancer, a finding that is consistent in other studies have reported that the population does not identify long-term benefits of eating fruits and vegetables or consumption of healthy eating. (Di Noia J, 2006).

Regarding barriers to eating food aspects they have been identified as the availability of less healthy foods and they are prepared easier and faster besides flavor.

Likewise, regardless of the gender adolescents they mentioned that lack of support from parents to follow a healthy diet because it is they who buy food and that their parents are not role models.

Furthermore the findings of this study indicate that the perceived benefits and barriers for behavior can be influenced by personal factors, as in the present study according to gender differences were found. For example, women receive greater benefits than men, some authors suggest that men prefer foods like meats and hard to digest foods (Paquette MC 2005) and (Lupton D. 1996).

With regard to the barriers to healthy food consumption aspects have been identified as the availability of less healthy foods and they are prepared faster and easier, besides flavor. Likewise, regardless of the gender adolescents they mentioned that lack of parental support to follow a healthy diet because it is they who buy food and that their parents are not role models.

**Recommendation of Vegetable and fruit in the adolescent population (NOM-043-SSA1-2012)) (Social Welfare Guidelines DOF)**

It should be informed that during this growth stage, which should be monitored as the Mexican Official Standard NOM-031-SSA2-1999 points, to care for the child's health, so you should adjust the suggested amount of diet accelerates correct, according to the familiar availability and physical activity, particularly in the supply of iron, calcium and folic acid and dietary fiber.

Source of iron foods of animal origin, legumes and vegetables.

Source of calcium: cereals, animal foods mainly.

Source of folic acid food of animal origin, vegetables, fruits and cereals.

Source of dietary fiber. Cereals, vegetables, fruits and legumes is

In food safety as nutritional quality criteria for food assistance program includes subjects Vulnerable risk groups subject to food assistance, are preferably children and adolescents, pregnant women, nursing mothers, people with disabilities, vulnerable seniors income. (DOF 06/10/2013 guidelines)

The corresponding food support for this program to be one of the following options:

- a) Provision, if required, can be accompanied by Food complement.
- b) Breakfast or hot meal according to the criteria of nutritional quality

**Purse**

Include 4 or more staples that constitute part of the food culture of the beneficiaries.

Include at least two or three food groups mentioned in the (NOM-043-SSA2-2012) vegetables and fruits, cereals, legumes and animal foods.

Include at least 2 cereals are a source of dietary fiber.

Include at least 2 varieties of legumes.

Should include a supplement, it should not contain sugar or sweeteners from their first three ingredients.

Breakfast or hot meal and / or cold mode; Quality Criteria (VF)

The same criteria for specific nutritional quality for school breakfast or lunch mode are considered hot. It is recommended:

20 cyclical school breakfast menus Committees whose design must consider the following points:

Include skim milk and / or natural water:

Should include fruit shall include the following: be prepared with only natural fruit, add a maximum of 20g / L ie 2 tablespoons per liter, this should be low frequency.

Include a main dish including vegetables, whole grains and legumes or animal food. That is fat dishes that require no or very small amounts, as sauce stewed, roasted, baked, roasted or cooked.

In order to contribute to increased consumption of vegetables, onion, garlic and tomato collection and / or tomatillo, will not be taken into account as a serving of vegetables.

Promote the serving of fruit or vegetable is fresh, based on purchasing power and distribution DIF parent or school breakfasts for purchase committees.

Offer fresh fruit or dried at breakfast cold mode.

On the recommendation of the group of fruits and vegetables raw or cooked grams for school-teen population.

Vegetables and fruit	Garlic, onion and other vegetables parsley cilantro to season	To Taste	
	VEGETABLES	100g	
	Leafy vegetables	50g	
	Chopped vegetables to accompany rice, soups or stews	50g	
	Guava, apricot plum	80g	2 pieces
	Banana, apple, pear, orange, tangerine	80g	½ parts
	Watermelon, melon, pineapple	80g	½ cup

Guidelines of the Social Food Assistance Strategy 2015. (Ministry of Health, DIF)

Finally to determine calorie needs is taken into account calorie per unit of height for age and sex (kcal / cm). The maximum caloric intake of women is about 2550 kcal during the time of menarche, around 12 years. This peak demand is followed by a gradual reduction. Parallel caloric intake of men occurs during the peak of the growth spurt and progressively increases to 3400kcal at age 16 and then decrease in proportion of 500 kcal to 19 years. Whose energy distribution percentage is 12-15% protein, 20-30% fat and 55-60% carbohydrate.

In the same period as mentioned before needs increase vitamins (B vitamins) and minerals (zinc, calcium, iron, folic acid), whose sources come from vegetables and fruits and other foods.

**Fruit and vegetables intake in Mexican population (Ramirez-Silva et al., 2009)**

The variables that are taken into account the recommendation of vegetables and fruit (VF), dietary intake (g) adequacy percentage (percentage of total consumption of the population or half the amount of the recommendations by the World Health Organization (WHO) and (AHA) American Heart Association.

Defining fruit and vegetables under the name of diversity of plant foods, vegetables, roots, leaves, stems, seeds, inflorescences, flowers and bulbs that contribute to the regulatory function of the body, they provide vitamins and minerals, provide much of the water and fiber the body needs. They are consumed raw or cooked, and have a low energy density and other bioactive components.

Fruit juices are excluded due to the high fructose and energy and low in fiber is therefore considered a negative effect on health.

According to NOM-043-SSA1-2015 criteria dietary guidance, foods are classified into 3 groups food groups:

- a) Vegetables and Fruits (VF)
- b) ANIMAL

It should promote the consumption of fruits and vegetables and regional station, if is possible raw shell that incorporate them into the daily diet helps reduce the energy density of the diet, and they are a source of carotenes, vitamin A and C, folic acid and dietary fiber and give color and texture to dishes as well as other vitamins and inorganic nutrients.

Daily intake (DI) of VF is estimated intake in grams per day based on frequency of use. This consumption is expressed in grams and no calorie. The percentage of adjustment was made taking into account recommendations to prevent cardiovascular disease by WHO and AHA.

The recommended intake is 200g for 1-4 years, 5-8 years of 300g to 400g for people age between 9-59 years old. The classification is given in three categories according to age-specific intake;

Or above the percentage of recommended intake or adequacy or higher:

- 1) Adequate intake.
- 2) Moderate intake inadequate: from 50% to 90% of the recommended intake.
- 3) Inadequate intake elevadamente: less than 50% of the recommended or less than 50% adequacy intake.

Relate to fruit and vegetable intake were taken into account by categorizing regions of Mexico, which was divided four regions:

- a) North (including North and South Baja California, Coahuila, Chihuahua, Durango, Nuevo Leon, Sonora and Tamaulipas)
- b) Center (Aguascalientes, Colima, Guanajuato, Jalisco, Estado de México, Michoacán, Morelos, Nayarit, Querétaro, San Luis Potosí, Sinaloa, Zacatecas).
- c) México City
- d) South (Campeche, Chiapas, Guerrero, Hidalgo, Oaxaca, Puebla, Quintana Roo, Tabasco, Tlaxcala, Veracruz y Yucatán)

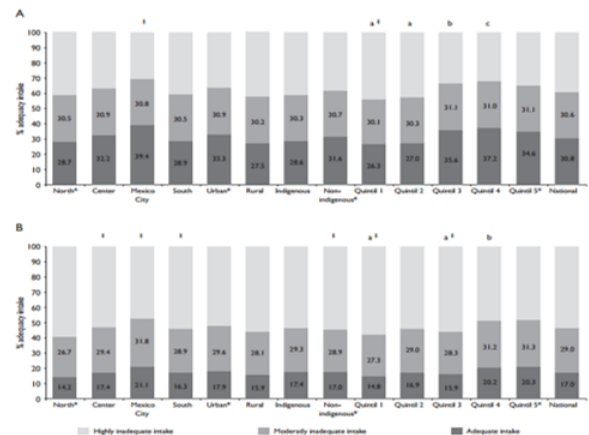


Figure 1 Adolescents and adults adequacy percentage distribution according to the recommendation of intake of vegetables and fruits (VF), ENSANUT 2006.

The results analyzed are a total of 3224 children aged 1-4 years, 8,294 children 5-11 years old and 7722 adolescents aged 12-18 years and 16349 adults 19-59 years of age accounted for:

With 61.3 g vs. 26.2 g preschoolers, 68.9g vs.34.2g school children, adolescents .43.3g vs 72.9g and 65.8g vs. 56.8g adults respectively.



The total amount of VF and recommended intake for each group is below the recommendation. See Fig. 1.

This study represents a low intake of fruit and vegetables among the Mexican population in relation to international recommendations. Low intake was observed in fruits and vegetables and in all age groups, regions, ethnic groups, higher socioeconomic levels in rural and urban population and both sexes. Only 30.8% of preschoolers, 17.0% from children of school age, 19.2% of adolescents and 24.2% of the adult population meets the recommended intake. Given the low intake in both low and high demand given the low socioeconomic levels, high prices of fruits and vegetables for calorie foods relative density low energy- and other cultural reasons linked to poverty. Another potential reason the population is poor access problems due to limitations of the transport of perishable foods such as fruits and vegetables.

At the same time the relationship with people living in northern given consumption patterns resulting from the nutrition transition due to globalization and modernization, in addition to weather conditions, which lavf staying indoors conditioners raising its price. The same relationship is associated in rural areas among indigenous people located in isolated areas whose local production compensates for the lack of supply in certain seasons of fruits and vegetables in season. And reinforcing the above low intake of certain groups is possibly related to demand rather than supply.

Definitely intake of fruits and vegetables among adolescents living in rural areas and non-indigenous is higher than in urban areas given the dietary patterns associated with modernity of life, for example eating fast food at home and abroad.

As a final conclusion is substantial efforts of parents, teachers, schools, teaching early childhood habits of healthy eating integrating the three groups of food diet as NOM-043 provides in particular VF, based on the recommendations by age in Suitable models settling sum power of parents to teenagers, who are subject to receive influence of the environment, accompanying the values of body image, whose value is overstated in this age also is up to the parent to provide a fair assessment of this to teenager, to prevent the occurrence of conduct disorder at an early age accompanied by physical activity according to age and skill adolescents.

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