

Research Article

Family Misperceptions of Childhood Obesity in Mexico City

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- Non-communicable diseases
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Abstract

Aims: To define children, parents, and grandparents ideas about children overweight and obesity.

Method: A questionnaire applied to 1380 median-low, low and very low income families living in Mexico City, selected in a consecutive way, during the assistance to primary care units, according to inclusion criteria: Parents acceptance, at least one child with overweight or obesity and at least one child with normal weight, father and mother living in every day coexistence, four grandparents alive, daily or at least 5 days/week contact with grandparents, regular assistance to school, normal reading comprehension, and one or both parents working outside of home. We use Cochran-Mantel-Haenszel association test.

Results: The mother and grandmother's opinion defines nutrition practices and optimal health state. Children define healthy food as the one recommended by the mother or the grandmother (100%), elaborated at home (100%), regardless of lipid and sugar amount (98%), any food with supplement and/or vitamins (97%), and Mexican style (crunchy, condiments, chili) is preferred in 95%. Adult member defines healthy food as elaborated at home (100%), regardless of lipid and/or sugar content (92%), natural food including industrialized fruit juices and sugar added flakes (98%) and those industrialized food added with minerals and vitamins (100%). Overweight was considered the best state of nutrition, and an overweight child is considered taller, stronger, leader, healthy and smart than a normal weight child. Child obesity is considered as a normal (even desirable) and transitory state. All of these observations showed a statistically significant association

Conclusions: Social and cultural factors such as overprotection and forced feeding by grandparents and parents, false traditional beliefs about health and nutrition in grandparents, and little knowledge about nutrition in parents and caregivers are present in Mexican families.

A high percentage consider overweight as a desirable condition during childhood, and few identify overweight or obesity as a chronic disease or related to non-communicable diseases.

INTRODUCTION

Overweight and obesity in children and adolescents are a Public Health problem in Mexico, where a high percentage presents overweight and obesity (ENSANUT 2012).

The main determinants are changing dietary practices (high carbohydrates solids and beverages) and increasingly sedentary lifestyle with daily exercise during considerably short periods of time (6 minutes/day in public schools).

Considering that overweight and obesity in childhood tends to persist in adult life, and that they are the main risk factor for chronic non-communicable diseases development, including insulin resistance metabolic syndrome, type 2 diabetes mellitus, systemic arterial hypertension, atherogenic vasculopathy (coronary artery diseases and cerebral stroke), dyslipidemia, nonalcoholic fatty liver disease, polycystic ovarian syndrome, site-specific neoplasms, and others, it is priority to establish preventive programs to avoid or resolve them [1-4].

Furthermore, cross-sectional and secular trends indicate an increase in childhood obesity globally, particularly in developing countries [5-10].

Comparing the incidence of overweight and obesity in Mexico from 1999 to 2012, it increased from 2.3 to 5.3% in pre-school children, from 18.6 to 26.3% in scholar children, and from 18.6% to 39.1 in teenagers, and in adults the prevalence of overweight and obesity is 87%, and although a General National Plan for Health has been launched since 8 years ago, the incidence and prevalence remains at the present in the same range [11].

The lifestyle of the families did not changed in this period of time eventhough many massive communication media (radio, television, internet, newspapers, periodic magazines, etc.), present educational messages trying to induce a change in nutrition and physical activity.

To investigate the perception of the families about overweight and obesity, and try to explain the faults of the educational

programs, we designed a study in open population.

To facilitate the understanding of the inclusion criteria in this investigation, some important data is:

1. Medium-low, low and very low income families represent more than 85% of Mexico City total population.
2. Normal nuclear families are constituted by mother, father, and children, and they keep frequent contact with paternal and or maternal grandparents, mainly if both parents work outside of the house at least 5 days/week.
3. Most of the children living in Mexico City eat breakfast at home, go to school at 7:30am taken by their parents, and are picked up from school at 1:30pm every day or very frequently by paternal or maternal grandmother/grandfather, and eat at 2-4pm (their main meal of the day or supper) at their grandparents house.
4. Normal educational program in Mexico consists of 2 or 3 years of preschool, 6 years of elementary school, 3 years of secondary school, 3 years of high school, and 4-5 years of university (bachelor's degree).
5. Exercise is part of the school program and consists of one hour/week of physical education with light activities such as running short distances, soccer, baseball, basketball, and/or gymnastics. Once a week most of the children play soccer in a non-formal competition, or in local leagues. The father plays soccer, basketball or baseball once a week (or less) in a non-formal competition or in local leagues. The mother goes to a gym once a week (or less), or do not perform any kind of exercise, and grandparents do not perform any kind of regular exercise.

AIMS

Define some of the children, parents, and grandparents' ideas about child overweight and obesity as a normal or abnormal phenotype, and correlate them with the educational objectives of General National Plan of Health.

MATERIAL AND METHODS

We applied a questionnaire in a direct interview to 1500 families (child, father, mother, maternal and paternal grandparents) living in Mexico City, selected in a consecutive way according to inclusion criteria, during the assistance to primary care units for acute disease, immunization program or check-up of healthy child.

All the children were born in Mexico City, 58% of the families had at least three generations living in Mexico City, 38% two generations and in 4% one or both parents migrated from other states of the country.

Inclusion criteria were: Father and/or mother acceptance to participate, at least one child with overweight or obesity and at least one child with normal weight (defined by body mass index percentiles from WHO or USA NHI studies), married parents (legal and/or religiously) and/or at least both living in daily coexistence with the children, the four grandparents must be alive, daily or at least 5 days/week contact with paternal or maternal grandparents, regular assistance of the children to

elementary or secondary school, normal reading comprehension, and one or both parents working out of home. All families signed consent information format and all the children older than 10 years old signed the assent information format.

Exclusion criteria were: Chronic disease in any child of the family, participation in weight loss program of one or more family members, family violence or psychological aggression.

Elimination criteria were: No assistance of one or more family members to answer the questionnaire, not answering one or more questions.

Once the mother or father accepted to participate, all the family members were invited to a direct interview in a specific weekend day and the questionnaire was applied in the same moment to all the family members without a chance to communicate between them during the questionnaire answering.

The questionnaire was validated by The National and Autonomous University of Mexico for a previous thesis of one Nutritionist, and consisted of multiple choice questions with a given space for free text for "other" option if necessary according the criteria of the respondent. As an example: Obesity during childhood: a) Is a normal condition, b) Is a light abnormal condition but not a disease, c) Is a moderate abnormal condition but not a disease, d) Is a severe abnormal condition but not a disease, e) Is a disease; or Obesity in children: a) It is permanent and irreversible, b) It is transitory and spontaneously reversible during childhood, c) It is transitory and spontaneously reversible when puberty start, d) It is transitory and spontaneously reversible when puberty ends, e) Is transitory but not spontaneously reversible. At the end of every question, in the options, there was a space to write followed by the legend: "If you need to write any other option to answer, please write it here".

The questionnaire was performed on Sunday mornings (to assure assistance of all the members of the family), in groups of 10 families (8-10 members per family) in one auditorium and in the presence of five interviewers (Pediatric Endocrinologists, Nutritionist, and Physical Anthropologist, previously trained and standardized, full aware of the study hypothesis), whose intervention consisted only on sorting doubts, but never to induce the answer, and to check that all the questions were answered (whenever an unanswered question was brought up to the family member from the interviewers, and he/she refused to answer it even so, this unwillingness to answer was respected). To avoid communication between family members during the answering of the questionnaire, they were placed in strategic locations, separated at least three places in any direction from the nearest member of their family, and communication was not allowed during the time of interview.

The results were analyzed in percentage, and as there were no differences between family members, no other statistical analysis was performed.

RESULTS

There were excluded 120 families because one or more family members did not attend (88 families) or incomplete answers (32 families), and the analysis was performed with the information of 1380 families.

Characteristics of the families are shown in Table 1.

The age of the children was 10.8±2.4 years old, without differences between males and females, or between normal weight, overweight and obese children.

BMI of normal children was -0.2±1.1 ED, for overweight children +1.3±0.3 ED, and for obese children +2.5±0.4 ED.

All the families were of medium-low, low or very low income, all the children attend to an public school and the average educational level of the parents and grandparents was: 72.5% with complete elementary level, from the prior percentage only 38.66% had completed secondary level, from the prior percentage only 18% had completed high school level, and from the prior percentage only 10.8% completed bachelor degree.

In 1159 families from the complete sample (83.98%) both parents work outside of home from 7-8am to 15-16pm, and consequently although parents are the primary care responsables, grandparents are primary guide of parents and/or co-participants in primary care.

In 978 families (70.86%) parents and children live in grandparent house or house to house with grandparent house.

The family female's opinion (mother and grandmother) defines or has strong impact on nutrition practices and optimal health state, and the father and grandfather defines only

snack selections during television time. When the maternal grandparents live within or near the parents' home the hierarchy roles about good nutrition definitions are: maternal grandmother, mother, and father, and the maternal grandfather opinion has little to none importance, and when the paternal grandparents live within or near the parents' home the hierarchy roles are: mother, paternal grandmother, and paternal grandfather, and father has the least important opinion.

The children define healthy food as: the one recommended by the mother or the grandmother (100%), elaborated at home (100%), in food elaborated in home, oil and sugar amount are not determinants or even important (98%), any food with supplement and/or vitamins (97%), and Mexican style (crunchy, condiments, chili) is preferred in 95%.

Adult members of nuclear family define healthy food as: elaborated at home (100%), regardless of oil and/or sugar content (92%), natural food including industrialized fruit juices (sweeten only with fructose) and sugar added flakes (98%), and those industrialized food added with minerals and vitamins (100%). Occasional Mexican style foods (2-3 time/week) are considered normal or not harmful.

The adult and siblings' opinions of nutritional state of normal, overweight and obese children, and the self-perception of the children are shown in Table 2. It is evident that overweight

Table 1: Educational, employment and biological characteristics of the families (n = 8280)

	Father	Mother	MGM	MGF	PGM	PGF
Educational	n=1380	n=1380	n=1380	n=1380	n=1380	n=1380
Incomplete elementary	110	110	607	442	621	428
Complete elementary	1270	1270	773	938	759	952
Incomplete secondary	356	381	232	422	531	428
Complete secondary	914	889	541	516	228	524
Incomplete High School	356	391	460	490	193	430
Complete High School	558	498	81	26	35	94
Incomplete Bachelor	430	408	76	24	25	86
Complete Bachelor 10	128	90	5	2	10	8
Employment						
Professional	442	359	0	0	0	14
Technician	497	345	0	14	0	0
Temporary employments	110	304	69	221	0	248
Auto employments	331	166	55	165	55	250
Retired	0	0	83	897	110	868
Home care	0	206	1173	0	1214	0
Biological						
Age (years)	38.2±4.6	35.4±5.7	60.3±5.1	65.3±4.8	59.2±5.1	65.6±4.8
BMI (k/m ²)	27.2±3.2	28.1±4.5	28.9±3.3	29.9±2.8	29.8±3.5	28.2±3.7

MGM: maternal grandmother; MGF: maternal grandfather; PGM: paternal grandmother; PGF: paternal grandfather

Professionals: Work with regular salary as government or private employees

Technician: Work with regular salary as government or private employees

Temporary employments: Work with occasional salary and frequent changes of employment

Auto employments: Family businesses, autonomous technical employment (plumber, gardener, seamstress, house keeper, etc.)

Retired: Receive regular salary as ex-government or private employee

Home care: Any regular salary

and obese children were considered as normal by themselves and their siblings, parents and grandparents. When comparing the perceptions in each group occupying the Cochran-Mantel-Haenszel association test, we found that these associations are statistically significant.

The children and adult's opinion of natural evolution of obesity in childhood are shown in Tables 3 and 4. When comparing the perceptions about the idea that obesity is a transitory state in each group occupying Cochran-Mantel-Haenszel association test, we found that these associations are statistically significant, only obesity in girls shows a tendency to significance when it comes to the perception of parents and grandparents.

The correlation of optimal silhouette (under nutrition, thin, normal, overweight or obese) with the better condition of health is shown in Table 5. It is evident that overweight is considered the best nutritional and health state. Occupying Cochran-Mantel-Haenszel association test, we found that these associations are statistically significant.

The characteristic of overweight children according to children and adults is shown in Table 6. In a very high percentage the overweight child was considered taller (which seems to be true), stronger, healthier and smarter than their non-obese siblings. The Cochran-Mantel-Haenszel association test, shows that these associations were statistically significant in both groups for children as parents and grandparents

There were no differences in answers between the families' time of residence in Mexico City in any item ($p < 0.8$).

DISCUSSION

The grandparents' points of view, could be influenced by the fact that 50-70 years ago, when Mexico was a country just leaving the post-revolutionary times, and beginning as a democratic state, the overweight child had more chances to survive to recurrent infectious diseases and nutritional imbalance than children with under nutrition (very frequent) or in the middle of normal and under nutrition (thin). Even, one normal child that suffered an infectious disease and nutrition imbalance, changed to thin or malnourished, and if recovery was not full, the next infectious disease will change to severe malnourished, with less opportunities of recovery and survival. Consequently during this period of time, when it was possible for the families, they induced over nutrition until the children were overweight to assure a better possibility of survival.

Actually, grandparents try to get an overweight child by inducing daily excessive consumption of food, including candies, cookies, cakes, chocolate-milk, sweet flakes, industrialized fruit juice, etc., and disagree and fight against the educational messages of the National General Plan for Health, modulating the perception of the parents and children about optimal state of nutrition, and consequently it is not rare that more than 80% of the parents consider that overweight is the better state

Table 2: Opinion of nutritional state (n = 1380 for mother, father, maternal and paternal grandparents)

Family member think about	Perception of nutritional state					
	Under nutrition	Thin	Normal	Overweight	Obese	p
Obese child self-perception	0	7	268	58	7	<0.0001
Overweight child self-perception	0	42	301	7	0	
Normal child about overweight sibling	0	69	552	55	14	
Normal child about obese sibling	0	55	483	62	90	
Normal child self-perception	124	483	69	14	0	0.01074
Overweight child about normal sibling	87	238	21	4	0	
Obese child about normal sibling	78	238	17	7	0	
Mother about normal child	552	621	207	0	0	<0.0001
Mother about overweight child	0	152	1214	14	0	
Mother about obese child	0	27	1076	248	29	
Father about normal child	166	966	248	0	0	<0.0001
Father about overweight child	0	290	1062	28	0	
Father about obese child	0	41	1063	221	55	
Maternal grandmother about normal child	635	455	290	0	0	<0.0001
Maternal grandmother about overweight child	14	138	1214	14	0	
Maternal grandmother about obese child	0	41	1077	234	28	
Maternal grandfather about normal child	193	966	221	0	0	<0.0001
Maternal grandfather about overweight child	0	276	1076	28	0	
Maternal grandfather about obese child	0	69	1062	235	14	
Paternal grandmother about normal child	662	483	207	28	0	<0.0001
Paternal grandmother about overweight child	14	152	1214	0	0	
Paternal grandmother about obese child	0	28	1076	235	41	
Paternal grandfather about normal child	179	966	235	0	0	<0.0001
Paternal grandfather about overweight child	0	317	1035	28	0	
Paternal grandfather about obese child	0	41	1035	248	56	
X ² of Cochran-Mantel-Haenszel association test						

Table 3: Conception of natural evolution of obesity among children

	Normal	Overweight	Obese	p
	n=690	n=350	n=340	
Childhood obesity is				
Normal	636	333	327	0.022
Morbid condition	54	17	13	
Pubertal obesity is				
Normal	611	323	321	0.005
Morbid condition	79	27	19	
Boys obesity				
Disappears at puberty	617	333	311	0.008
Persist at puberty	73	17	29	
Girls obesity				
Disappears at puberty	306	171	180	0.02
Persist at puberty	384	179	160	

Table 4: Conception of natural evolution of obesity among adults

	Mother	Father	Grandmother	Grandfather	p
	n=1380	n=1380	n=2760	n=2760	
Childhood obesity is					
Normal	1315	1308	2732	2658	<0.0001
Morbid condition	65	72	28	102	
Pubertal obesity is					
Normal	1184	1101	2407	2026	<0.0001
Morbid condition	196	279	353	734	
Boys obesity					
Disappears at puberty	1290	1160	2481	2382	<0.0001
Persist at puberty	90	220	279	378	
Girls obesity					
Disappears at puberty	807	774	1637	1554	0.07
Persist at puberty	573	606	1123	1206	

Table 5: Correlation of different silhouettes with the optimal state of nutrition and health

	Thin Silhouette	Normal Silhouette	Overweight Silhouette	Obese Silhouette
Normal child (n=690)	55	124	497	14
Overweight child (n=350)	0	49	273	28
Obese child (n=340)	0	14	292	34
Mother (n=1380)	0	179	1104	97
Father (n=1380)	0	193	1104	83
Grandmother (n=2760)	0	28	2484	248
Grandfather (n=2760)	0	193	2374	193

Undernutrition silhouette was not chosen by any participant
 χ^2 Cochran-Mantel-Haenszel 460.5 P < 0.00001

of health, because overweight child is taller, stronger, more of a leader, healthier and smarter than normal and thin children, and consequently more than 72% of the children who receive education in this line of thought, consider that overweight is the aim to get in a good nutrition balance.

Even more, self-perception of normal children is that they are thin (70%) or malnourished (18%), and their obese and overweight siblings had the same perception.

Besides, Food Industry uses more than 90% of commercial time in massive communication media to send messages about the

importance of vitamins and supplements in daily consumption, its high content of industrialized food, and the fact that during pre-exercise, trans-exercise and post-exercise, a high caloric and electrolyte content beverages are not only indispensable but imperative for children and adolescents.

Additionally to considering overweight and obese children as well nourished, more than 92% of children and adults do not identify obesity and overweight as a chronic disease and more than 84% of children and adults considerer that obesity during childhood is a temporary condition and that it will spontaneously disappear when puberty starts [12].

Table 6: What family members think about characteristics of overweight child

	Taller	Stronger	Leader	Healthy	Smart (>IQ)	p CMH
Normal child	676	690	552	607	428	0.00023
Overweight child	350	350	315	322	322	
Obese child	337	340	303	320	316	
Mother	1133	1297	1325	1380	1311	<0.0000001
Father	1076	1311	938	1352	1187	
Grandmothers	2622	2732	2539	2760	2567	
Grandfathers	2482	2732	2456	2760	2566	

There are a number of nutrition-related socio-cultural and traditional beliefs, mostly passed down through generations, firmly ingrained in mothers and grandmothers of children residing in Mexico. Overweight children are often said to have baby fat that parents believe will disappear as they get older, but it is known that a majority of them will remain obese during later life [13]. Another common myth is that a fat child is a healthy child.

Mothers believe that feeding oils, ghee (clarified butter), and butter to children would be beneficial for their growth and impart strength.

Similar to other studies which showed a positive relationship between prevalence of obesity and children living in homes where the grandmother cook, in the Mexican families it is the maternal grandmother and paternal grandmother who dictate the nutrition practices [11,14].

Although in the last 15 years we have learned enough to understand the pathological bases of co-morbidities associated with overweight and obesity, it has been not possible to influence the information received through massive communication media, or in the establishment of effective strategies for prevention and control of overweight and obesity in children and adolescents, and perhaps one of the main factors is to ignore or give little importance to the conception of good nutrition aims and practices into the Mexican families which do not lead to establish appropriate strategies [15-18].

CONCLUSION

Sociocultural factors as overprotection and forced feeding by grandparents and parents, false traditional beliefs about health and nutrition in grandparents, and low knowledge about nutrition in parents and caregivers are present in Mexican families.

Grandparents educate parents and children with misperceptions about overweight and obesity and a high percentage of the population consider that both conditions are desirable during childhood and represent an advantage for any child, and a very low percentage of the population identify overweight or obesity as a chronic disease or relate it to non-communicable diseases that appear during adult life.

Driven by aggressive advertising practices, relatively low cost of energy-dense foods and improved purchasing power, children and adolescents are increasingly consuming foods high in saturated fat and refined carbohydrates, sweetened carbonated beverages, and diets low in polyunsaturated fatty acids and fiber.

The authorities of the National General Plan of Health must be aware of these family misperceptions, and that it is urgently needed to elaborate new strategies for effective health educational programs to impact not only children, but also the grandmothers and mothers on good nutrition practices, and convince them that overweight and obesity during childhood are chronic diseases and precludes for non-communicable diseases in adult life.

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