

The larder the fridge and the obesity: the impact in the family of daily foods' possession, the way of celebrating birthdays, fast foods and the child aspect, mother's perception and self-perception, and the body volume

Summary

Introduction: Food selection and dietary pattern impact in weight at pediatric age. Unhealthy dietary habits, including foods with added sugar, sodium, and saturated fat, are associated with an increased risk of childhood obesity.

Objective: Determine the eventual relationship between the foods that are regularly purchased, offered and consumed, with the potential risk of generating overweight and obesity.

Materials and methods: An analytical and cross-sectional study was carried out using a structured and closed survey, from 1-1-19 to 31-7-19 in a representative sample of mothers of children from 1 to 10 years old. Data analysis was performed using the Epi Info 6 Program (CDC / WHO).

Results: 1144 surveys were carried out (50.09% girls; 49.91% boys. Mean age 5.59 ± 2.83 years). Aspect of the children: 20.6% were thin, 54.7% were normal, 18.4% were overweight, and 6.3% were obese. Foods that predispose to overweight and obese children were: yogurt, juices, mustard, ketchup, cold cuts, sausages, hamburgers, ready sauces, desserts, soft drinks, cream, ice cream, canned fruits, meat mincemeat, preserves, fruit juice powders, chips and sticks. The five foods that generated the highest proportion of overweight and obese children, (mean 24.7%) were: sticks: 48.5%; cheese puffs: 42.4%; chips: 39.4%; soft drinks 37.9%; fruit juice powders at about 36.5%. When the "Distortions" were analyzed it appeared that mothers who saw themselves with less volume than they have, greatly increased the proportion of children who were overweight and obese.

Conclusions: 1) The existence at home of snacks and sugar-rich drinks and foods given on birthdays' celebrations significantly determined the existence of overweight and obesity in children. Mothers who perceived themselves of lesser volume from that observed by the operator do increased the overweight and obese children proportion.

Keywords: feeding habits, pediatrics, weight excess

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Introduction

The WHO¹ states that nutrition is the ingest of food in relation to the dietary needs of the organism. Good nutrition (a balanced diet combined with regularly physical exercise) is a key element of good health. Because of this, a bad nutrition can increase the vulnerability to diseases, alter physical and mental development, immune response, and even reduce productivity. Aguirre² says that "when facing the universality of the biologic fact we face infinite forms that has taken its satisfaction in people from different towns, different places and throughout the time. An important characteristic of the eating habits viewed from the anthropologic point of view is that the cultural ways of eating actually ended up by conditioning the biologic need of doing it". Historically, man tried to store food by using different techniques, so that food could be available both in abundance and scarcity times. Some of these techniques consisted in storing together dry cereal grains, different meats, initially with small animals alive (goats, sheep, chickens, among others) or even through other store

procedures such as salting, drying, smoking, by heat and acid means, or even by increasing the quantity of salt or sugar, in order to prevent the appearance of germs because of the lack of water in some (salting) and of acidification in the latter (sugaring).

Food industry has researched and implemented physical, chemical, genetic, biological and marketing processes in order to facilitate the preservation of foods but inevitably it has also altered or denaturalized the intrinsic characteristics of them. What above claimed is based on the new family dynamics, long working days and the lack of time that leads to scarce recreational or sport activities, eventually making population to opt for quick solutions when consuming food and therefore modifying the consumption patterns and placing on the highest of the podium ultra-processed foods and drinks that are largely responsible for today's health problems, particularly overweight.

Industrialization food process in large scale has made transformations to the flavor, scent, color, texture and also modifications mainly of macro and micronutrients. These alterations

are closely related to overweight and obesity, hepatic steatosis and metabolic syndrome, among others.

Because of these issues, we considered it was the case to analyze cultural aspects connected to children eating habits, both in house groceries as in the normal stock kept on the “larders” and to analyze childrens' birthdays celebrations. In relation to the latest, we analyzed which food was offered and the entertaining activities carried out during the birthday celebration. The final purpose of the present work was to determine the possible relationships between the foods consumed daily with the potential risk that could be triggered on health level when in presence, or not, of these foods in the family and social environments.

Materials and methods

An analytical and cross-sectional study was carried out using a structured and closed survey from January 1st 2019 until July 31st same year, on a representative sample of mothers with children between the age of 1 and 10 years old. The interviewers were pediatricians and nutritionists from different provinces of the Argentine Republic.

A closed and structured survey was carried out to collect data about food supplies and products stocked on larder/s and fridge/s, the foods and drinks offered on birthdays' celebrations, as well as the active and passive activities carried out during the celebrations (see Annex 1). The tool used is original and was proposed and / or expanded by the pediatricians and nutritionists.

Nutritional status

Nutritional status was carried out on the self-perception of the surveyed mother and the interviewer's perception of the mother and child surveyed. The categories used were: thin, normal weight, overweight and obesity.

Data analysis

Data analysis was performed using the Epi Info 6 Program (CDC /

WHO). Differences between averages and percentages were analyzed using ANOVA and Chi square, respectively.

Results

1144 surveys were carried out, of which 50.09% (n = 573) corresponded to girls and 49.91% (n = 571) to boys, with a mean age of 5.59 ± 2.83 years.

Aspect of the children: 20.6% (n = 236) were thin, 54.7% normal (n = 626); 18.4% (n = 210) were overweight and 6.3% (n = 72) were obese.

Mothers' self-perception: 15.0% perceived themselves as thin (n = 172); 53.1% as normal (n = 607); 23.4% as overweight (n = 268) and 8.5% as obese (n = 72).

Operator's perception: 14.5% were perceived as thin (n = 166); 43.8% as normal (n = 607); 27.6% as overweight (n = 316) and 14.1% as obese (n = 161).

Relation between children's aspect and larder and fridge food stocks

Next there is the detailed order of foods with higher presence in homes and the correlation with children's aspect.

From Table 1 it can be deduced that there are products that do not modify children's proportions which are identified with the letter Ω. Some other products which presence produces and increase in thin and normal children are identified with symbol @. Finally, the group of foods that increases overweight and obese children's proportion are identified with the letter €. Last column of Table 1 shows the percentage of overweight and obese children in every food product evaluated. In this regard, the neutral (Ω) foods were: rice, pasta, eggs, salt, meat, sugar, milk, oil, flours, cheese, sweet biscuits, mayonnaise, marmalades, saltine crackers, caramelized milk, white bread, spreadable cheese, mineral water, butter, tomatoes, canned fish, cornflakes, olives, sandwich bread, lemonade and red peppers.

Table 1 Larder and fridge, effect on children

Food	n	% +	λ 2	P-value	Rule	% OW-O (24.7)
Rice	1108	96.9	1.73	0.631	Ω	24.8
Pasta	1099	96.1	3.39	0.335	Ω	25.1
Eggs	1090	95.3	5.15	0.16	Ω	24.5
Salt	1086	94.9	1.19	0.754	Ω	24.9
Vegetables	1083	94.7	16.75	<0.000	@	23.3
Meats	1066	93.2	1.92	0.59	Ω	24.2
Sugar	1060	92.7	3.09	0.377	Ω	24.9
Milk	1023	89.4	1.57	0.066	Ω	24.9
Oils	1011	88.4	1.38	0.71	Ω	25
Fresh fruits	1009	88.2	13.24	<0.000	@	22.2
Flour	987	86.3	2.15	0.542	Ω	24.5
Cheese	959	83.8	4.39	0.222	Ω	25.8
Sweet biscuit	950	83	1.81	0.621	Ω	25.3
Mayonnaise	934	81.6	5.99	0.112	Ω	26
Marmalade	912	79.7	3.81	0.282	Ω	25.3
Saltine cracker	902	78.8	4.07	0.253	Ω	25.2

Table continued...

Food	n	% +	λ 2	P-value	Rule	% OW-O (24.7)
Yogurt	837	73.2	15.41	0.001	€	27.2
Juices	761	66.5	25.28	<0.000	€	28.3
Unprocessed fruit	761	66.5	14.97	0.001	@	23.3
Pulses	758	66.3	18.85	<0.000	@	21.5
Caramelised	754	65.9	5.1	0.164	Ω	26.7
Milk						
White bread	748	65.4	6.05	0.109	Ω	26.3
Spreadable cheese	721	63	3.04	0.385	Ω	25.8
Mineral water	709	62	4.75	0.191	Ω	24.3
Butter	697	60.9	3.18	0.365	Ω	24.7
Tomato	606	53	3.5	0.32	Ω	26.4
Mustard	553	48.3	17.43	<0.000	€	29.1
Ketchup	551	48.2	24.51	<0.000	€	29.8
Cold meats	534	46.7	22.16	<0.000	€	28.3
Sausages	533	46.6	25.08	<0.000	€	31.3
Hamburgers	511	44.7	24.71	<0.000	€	31.5
Mineral water	507	44.3	13.18	0.004	@	20.3
Canned fish	493	43.1	2.11	0.549	Ω	26.6
Cornflakes	469	41	2.83	0.419	Ω	26
Sauces	459	40.1	15.11	0.001	€	30.6
Desserts	431	37.7	29.49	<0.000	€	33.2
Soft drinks	404	35.3	68.58	<0.000	€	37.9
Cream	400	35	17.66	<0.000	€	28
Dry fruit	379	33.1	8.5	0.036	@	22.2
Ice cream	365	31.9	27.01	<0.000	€	34
Canned fruit	355	31.1	14.94	0.001	€	30.1
Olives	353	30.9	4.39	0.222	Ω	28
Ground beef	325	28.4	42.63	<0.000	€	32.9
Sandwich bread	307	26.8	4.37	0.224	Ω	27.7
Canned food	292	25.5	30.93	<0.000	€	32.9
Fruit juice powders	285	24.9	30.7	<0.000	€	36.5
Chips	269	23.5	45.12	<0.000	€	39.4
Cheese puffs	184	16.1	40.55	<0.000	€	42.4
Sticks	163	14.2	62.8	<0.000	€	48.5
Lemonade	143	12.5	1.69	0.639	Ω	24.5
Red peppers	73	6.4	6.34	0.096	Ω	34.2

OW-O, overweight-obesity

Furthermore, the foods that were related to thin or normal weight (@) children were: fresh fruit, unprocessed fruit, pulses, mineral water and dry fruit. Differently, the foods that promoted an increase of overweight or obese (€) children were: yogurt, juices, mustard, ketchup, cold meats, sausages, hamburgers, ready sauces, desserts, soft drinks, cream, ice creams, canned fruit, ground beef, canned food, fruit juice powders, chips, cheese puffs and sticks. Five foods that were associated with the highest proportion of overweight and obese (which average is 24.7%) children were: sticks 48.5%, cheese puffs

42.4%, chips 39.4%, soft drinks 37.9% and fruit juice powders 36.5% (Table 1).

Operator's perception about mothers and the correlation with the food stocks on larder and fridge

Next there is the detailed order of foods with higher presence in homes and the correlation with mothers' aspect according to the interviewer's perception. In Table 2 there are products that did not

modify the distribution's proportions of the mothers in the thin, normal, overweight and obese categories. Then appears another group of foods that decreased the proportion of overweight and obese mothers and finally, the last group of foods which its presence caused an increase of mothers that were overweight and obese. Foods that did not relate to weight categories (Ω) were: rice, pasta, eggs, salt, vegetables, meat, oil, fresh fruits and flours, unprocessed fruits, *dulce de leche* [sweet caramel], water, butter, mineral water, canned fish, cornflakes, sauces, cream, canned fruit, olives, lemonade and red peppers. Foods (@) that related with thin or normal weight mothers and that promoted an increase of thin or normal weight

mothers were: pulses, spreadable cheese and dry fruits. Lastly, foods (€) that promoted an increase of overweight and obese mothers were: sugar, milk, cheese, sweet biscuits, mayonnaise, marmalade, saltine crackers, yogurt, juices, white bread, tomato, mustard, ketchup, cold meats, sausages, hamburgers, desserts, soft drinks, ice creams, ground beef, sandwich bread, canned food, fruit juice powders, chips, cheese puffs and sticks.

Five foods that caused the highest proportion of overweight and obese (which average is 41.7%) mothers were: salty sticks 63.8%, cheese puffs 62.0%, ground beef 57.5%, soft drinks 55.9% and chips 54.3% (Table 2).

Table 2 Larder and fridges, effect on mothers

Food	n	% +	λ 2	p-value	Rule	% OW-O (41.7)
Rice	1108	96.9	1.09	0.78	Ω	41
Pasta	1099	96.1	7.34	0.061	Ω	42.3
Eggs	1090	95.3	5.35	0.147	Ω	41.9
Salt	1086	94.9	5.73	0.125	Ω	42
Vegetables	1083	94.7	1.4	0.705	Ω	41.9
Meats	1066	93.2	0.63	0.89	Ω	41.7
Sugar	1060	92.7	8.85	0.031	€	42.7
Milk	1023	89.4	11.12	0.011	€	43.3
Oils	1011	88.4	0.39	0.942	Ω	41.9
Fresh fruit	1009	88.2	2.09	0.552	Ω	40.9
Flour	987	86.3	5.48	0.139	Ω	42.8
Cheese	959	83.8	9.83	0.02	€	43.4
Sweet biscuit	950	83	7.81	0.05	€	43.5
Mayonnaise	934	81.6	11.88	<0.000	€	43.7
Marmalade	912	79.7	10.87	0.012	€	43.5
Saltine crackers	902	78.8	8.56	0.035	€	43.8
Yogurt	837	73.2	31.62	<0.000	€	45.8
Juices	761	66.5	35.35	<0.000	€	59.9
Unprocessed fruits	761	66.5	2.99	0.392	Ω	40.4
Pulses	758	66.3	10.11	0.017	@	38.7
Caramelised	754	65.9	6.75	0.08	Ω	43.9
Milk						
White bread	748	65.4	11.58	<0.000	€	44.8
Spreadable cheese	721	63	9.97	0.018	@	43
Water	709	62	0.46	0.926	Ω	42.3
Butter	697	60.9	3.46	0.325	Ω	41.3
Tomato	606	53	15.05	0.001	€	46
Mustard	553	48.3	21.56	<0.000	€	48.1
Ketchup	551	48.2	21.58	<0.000	€	46.1
Cold meats	534	46.7	10.44	0.0151	€	46.1
Sausages	533	46.6	15.72	0.001	€	47.7
Hamburgers	511	44.7	16.37	<0.000	€	47.9
Mineral water	507	44.3	5.72	0.126	Ω	39.1
Canned fish	493	43.1	5.34	0.148	Ω	45.2

Table continued...

Food	n	% +	λ 2	p-value	Rule	% OW-O (41.7)
Cornflakes	469	41	2.43	0.487	Ω	42.9
Sauces	459	40.1	7.4	0.06	Ω	45.9
Desserts	431	37.7	33.58	<0.000	€	50.8
Soft drinks	404	35.3	54.37	<0.000	€	55.9
Cream	400	35	2.59	0.458	Ω	44
Dry fruit	379	33.1	19.39	0.00022	@	32.7
Ice cream	365	31.9	30.53	0.000001	€	53.2
Canned fruit	355	31.1	7	0.071	Ω	45.9
Olives	353	30.9	1.48	0.686	Ω	44.2
Ground beef	325	28.4	52.4	0	€	57.5
Sandwich bread	307	26.8	11.42	0.0096	€	46.6
Canned food	292	25.5	25.54	0.000011	€	54.1
Fruit juice powders	285	24.9	18.58	0.00033	€	50.9
Chips	269	23.5	26.65	0.000006	€	54.3
Cheese puffs	184	16.1	49.66	0	€	62
Sticks	163	14.2	56.14	0	€	63.8
Lemonade	143	12.5	2.07	0.558	Ω	46.2
Red peppers	73	0.64	6.75	0.080	Ω	53.4

OW-O, overweight-obesity

Food consumption on birthdays and its correlation to child aspect

In relation to the products/foods given during birthdays' celebrations, it was observed that soft drinks, cheese puffs, pizzas, sticks, mayonnaise, juices, hot dogs, pastry, savory pies, hamburgers, ketchup, ice cream, mustard, ham sandwich, fancy pastries, French

pastries and savory biscuits had a direct link on children that were overweight (€); while the presence of water showed a relation with thin children (@). The rest of the foods, such as cakes, chips, candies, sandwiches, sweet biscuits, tomato, lettuce, salty peanuts and saltine crackers did not cause differences among the categories of the child's nutrition state (Ω) (Table 3).

Table 3 Birthdays, effect on children

Food	n	% +	λ 2	p-value	Rule	% OW-O (24.7)
Cakes	1047	91.5	3.2	0.361	Ω	24.7
Chips	1030	90	2.93	0.402	Ω	25.2
Soft drinks	1026	89.7	8.26	0.04	€	25.3
Candies	948	82.9	4.66	0.21	Ω	25.6
Cheese puffs	926	80.9	10.92	0.012	€	26.3
Pizzas	864	75.5	14.78	0.002	€	26.7
Sticks	805	70.4	10.56	0.014	€	27.2
Mayonnaise	764	66.8	1.02	0.011	€	27.6
Sandwich	744	65	7.4	0.06	Ω	26.9
Juices	690	60.3	8.05	0.044	€	27.5
Hot dog	631	55.2	14.63	0.002	€	29
Savory pies	606	53	19.13	<0.000	€	28.2
Water	593	51.8	23.61	0	@	19.1
Hamburger	536	46.9	11.16	0.01	€	29.1
Ketchup	483	42.2	34.56	<0.000	€	33.3 (3)
Sweet biscuits	468	40.9	5.44	0.142	Ω	27.4

Table continued...

Food	n	% +	λ 2	p-value	Rule	% OW-O (24.7)
Ice cream	461	40.3	11.66	<0.000	€	28.9
Mustard	450	39.3	22.32	<0.000	€	31.6 (4)
Ham sandwich	427	37.3	15.49	0.001	€	30.4 (5)
Fancy pastry	427	37.3	13.94	0.002	€	30.4 (5)
Tomato	402	35.1	1.44	0.695	Ω	24.4
Lettuce	359	31.4	1.93	0.586	Ω	24
Salty peanuts	331	28.9	3.2	0.361	Ω	24.8
Saltine crackers	236	20.6	6.73	0.081	Ω	29.2
French pastry	236	20.6	14.42	0.002	€	33.1 (2)
Fruits	155	13.5	2.93	0.402	Ω	21.9
Savory biscuits	128	11.2	17.88	<0.000	€	38.3 (1)
Salty peanuts	104	9.1	2.06	0.559	Ω	25

OW-O, overweight-obesity

Food consumption on birthdays and its correlation to mother's perception aspect

In relation to the products/foods given during birthdays' celebrations, it was observed that in mothers' perception cakes, chips, cheese puffs, pizzas, mayonnaise, sandwiches, sausages, savory pies, hamburgers, ketchup, sweet biscuits, mustard, ham sandwich, fancy pastries, saltine crackers, French pastries and savory biscuits had a direct link on those mothers that were overweight (€); while the presence of water, tomato and fruits showed a relation with thin mothers (@). The rest of the products/foods, such as soft drinks, candies, sticks, fruit juice powders, ice cream, lettuce, salty peanuts and raw peanuts did not cause any difference among the categories of the mother's nutrition state (Table 4).

Table 4 birthdays, effect on mothers

Food	N	% Trend	λ 2	p-value	Reg.	% SP-O (41.7)
Cakes	1047	91.5	8.28	0.04	€	42.7
Chips	1030	90	11.21	0.01	€	42.7
Soft drinks	1026	89.7	5.79	0.122	Ω	42.8
Candies	948	82.9	2.43	0.488	Ω	42.6
Cheese puffs	926	80.9	10.15	0.017	€	43.2
Pizzas	864	75.5	17.86	<0.000	€	44.4
Sticks	805	70.4	4.37	0.223	Ω	42.2
Mayonnaise	764	66.8	9.71	0.021	€	44.5
Sandwich	744	65	7.76	0.051	€	43.5
Fruit juice powders	690	60.3	2.00	0.573	Ω	42.9
Sausage	631	55.2	16.17	0.001	€	45
Savory pies	606	53	16.40	<0.000	€	46.5
Water	593	51.8	11.29	<0.000	@	38.3
Hamburgers	536	46.9	14.60	<0.000	€	46.6
Ketchup	483	42.2	27.72	<0.000	€	49.9 (3)
Sweet biscuits	468	40.9	4.63	<0.000	€	47.6
Ice cream	461	40.3	6.34	0.096	Ω	45.6
Mustard	450	39.3	23.06	<0.000	€	48.7 (4)

Relation between children's aspect and the entertainment on birthdays

In relation to the different recreational activities during birthdays' celebrations we saw that those called "static" activities as singing, story tales and clown shows, where children usually are seated, are related with an increase number of overweight and obese children (€). On the other hand, the "dynamic" activities such as playing with balloons or climbing up and down on slides, which require physical activity, do increase the proportion of thin or normal weight children (@), while the rest of the activities did not show a correlation between the weight categories (Table 5).

Table continued...

Food	N	%Trend	λ 2	p-value	Reg.	% SP-O (41.7)
Ham sandwich	427	37.3	12.38	0.006	€	45.6
Fancy pastries	427	37.3	13.40	0.003	€	46.8
Tomato	402	35.1	7.87	0.048	@	40.3
Lettuce	359	31.4	4.73	0.193	Ω	39.3
Salty peanuts	331	28.9	3.46	0.326	Ω	42.9
Saltine crackers	236	20.6	8.13	0.043	€	48.3 (5)
French pastries	236	20.6	15.13	0.002	€	52.5 (2)
Fruits	155	13.5	19.90	0.012	@	40.6
Savory biscuits	128	11.2	13.65	0.003	€	53.9 (1)
Raw peanuts	104	9.1	3.69	0.296	Ω	49

Table 5 Entertainment of children on birthdays

Activity	N	% Participation	λ 2	p-value	Rule	% OW-O (24.7)
Piñata	750	65.6	1.44	0.695	Ω	25.5
Balloons	747	65.3	7.91	0.047	@	24
Inflatable games	689	60.2	5.26	0.153	Ω	22.8
Ball player	637	55.7	5.81	0.121	Ω	23.4
Balls	580	50.7	2.01	0.569	Ω	23.8
Singing games	502	43.9	3.03	0.386	Ω	26.7
Entertainer	491	42.8	2.89	0.408	Ω	25.7
Trampoline	483	42.2	1.34	0.72	Ω	25.1
Slide	422	36.9	11.51	0.009	@	22.7
Courts	400	35	2.91	0.406	Ω	27.5
Songs	446	30	11.4	0.009	€	28.5
See-saw	304	26.6	7.13	0.06	Ω	25
Swimming pool	304	26.6	4.56	0.207	Ω	28.6
Swings	297	26	4.45	0.216	Ω	26.3
Merry-go-round	228	19.9	4.84	0.183	Ω	23.7
Puppets	204	17.8	4.21	0.239	Ω	27.9
Beuty games	187	16.3	3.64	0.303	Ω	27.3
Story tales	183	16	9.71	0.021	€	27.3
Musical chairs	182	15.9	5.35	0.148	Ω	31.3
Sandbox	152	13.3	3.56	0.313	Ω	28.9
Magician	148	12.9	1.96	0.58	Ω	29.1
Clowns	135	11.8	7.97	0.046	€	34.1

OW-O, overweight-obesity

Fast food consumption and child's aspect relation

Tables 6 (a&b) show the that as the frequency to fast food restaurants increased so did the proportion of overweight and obese children and mothers. Comparison between operator's perception about the "volume" of the mother and the mothers' self-perception about their body volume.

Body volume according to the operator: 14.5% (n= 161) were thin, 43.8% (n=501) were normal, 27.6% (n=316) were overweight

and 14.1% (n=161) were obese. Self body volume according to the mother: 15% (n= 172) thin, 53.1% (n= 607) normal, 23.4% (n= 268) overweight and 8.5% (n= 97) obese. This difference of perception and self-perception was extremely significant. (chi: 350,93; gl: 9; p=<0.0001). If we proposed a correlation index (operator/mother) we can see that there is a high correlation with the "thin" woman (0.96), a lower correlation with the "normal" woman (0.82) and "overweight" woman (0.85) and a very low correlation with the obese woman (0.60) (Tables 7&8).

Table 6 (a) Operator's perception of children's nutrition state and the relationship with fast food restaurants' attendance

Group	Fast food attendance				
	Never	Once a month	Twice a month	Four times a month	Eight times a month
Children					
Thin	154	50	14	13	5
Normal	378	151	55	37	5
Overweight	98	40	28	26	18
Obese	21	18	10	11	10
Overweight and obese (%)	18.50%	22.40%	36.70%	43.20%	73.70%
Total	651	259	109	87	38

Chi, 100.89 gl 12; P 0.000000

Table 6 (b) Operator's perception of mothers' nutrition state and the relationship with fast food restaurants' attendance

Mothers	Fast food attendance				
	Never	Once a month	Twice a month	Four times a month	Eight times a month
Thin	119	31	8	5	3
Normal	302	118	39	33	9
Overweight	147	81	40	33	15
Obese	83	29	22	16	11
Overweight and obese (%)	35.30%	42.50%	56.90%	52.30%	64.30%
Total	651	259	109	87	38

Chi = 42.24 gl 12; P 0.000000

Table 7 Correlation index between perception, self-perception and nutrition state

Correlation index	Thin	Normal	Overweight	Obese
Perception	166	501	316	161
Self-perception	172	607	268	97
Index	0.96	0.82	0.85	0.6

Table 8 Relation between operator's perception and the mother's self-perception

Operator's perception	Mother's self-perception			
	Thin	Normal	Overweight	Obese
Thin	(A) 105	(B) 55	(B) 4	(B) 2
Normal	(C) 50	(A) 410	(B) 39	(B) 2
Overweight	(C) 9	(C) 106	(A) 178	(B) 23
Obese	(C) 8	(C) 36	(C) 47	(A) 70

Observations about the distortion between perception and self-perception and the child's aspects of distribution

Finally, a distribution of child's different aspects analysis was carried out in relation to the body volume and the operator's perception and the mother's self-perception. If we look at the child's aspect distribution (thin, normal, overweight and obese) in relation to the distortion A, B and C, then groups B and C accumulate a higher

significantly proportion of overweight and obese children. Chi 2 = 30.49 GL 6 P: 0.00003 (see chart).

After analyzing the different "Distortion" groups, it emerges that the mothers who perceived themselves as of greater volume actually increased the proportion of the overweight and obese children. But the mothers that perceived themselves as of lesser volume are the ones who increased the most these proportions. The value is highly significant on the mothers who perceived themselves thinner (Chart 1).

Children's distribution aspect in relation to the mother's body "distortion"

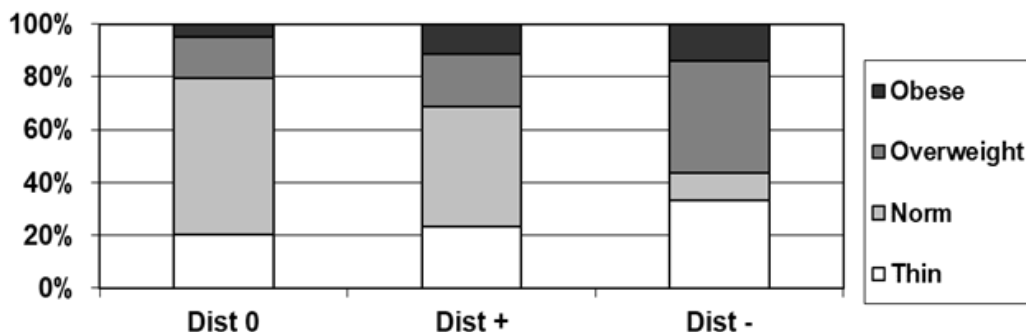


Chart I Children's distribution aspect in relation to the mother's body "distortion"

Discussion

The German philosopher and anthropologist Ludwid Feuerbach, wrote in 1850 in "Nutrition education", the famous phrase "We are what we eat". Effectively, this phrase applies to the observations and evident relations shown in our work between the consumption of ultra-processed foods with a higher index of overweight/obesity. The importance of the results obtained and the evident direct relationship before mentioned, doesn't derive from the perception that the observer or interviewed could have about the physical image, but far more from the consequence that the overweight/obesity can eventually trigger in a person, the consequences that this can provoke, and increasing the risk when the equation is composed by consumption of foods rich in saturated fat and low in essential nutrients (both macro and micro nutrients). Every day it is more evident and alarming the increasing percentage of population coping with overweight and obesity problems; being relevant the increase in the pediatric population. It is also alarming to see how the population is not conscious of what the excess body fat really implies, not because of the person's physical aspect but far more because of the impact and pathologic associations that this condition can entail. Child overweight and obesity are well known risk indicators of obesity in adulthood. Furthermore, they are risk factors for developing non-communicable diseases such as arterial hypertension, dyslipidemia, hepatic disease (fatty liver), diabetes, polycystic ovary syndrome and obstructive sleep apnea. It can also entail psychosocial problems that include discrimination, isolation, low self esteem and bullying; therefore causing negative repercussion on person's health, education and quality life. It is believed that between 40-60% of obese children will turn into obese adults with obvious consequences to their health.³⁻¹³

Foods preferences and a dietary pattern impact on weight from the pediatric age. Non healthy dietary habits that include foods with added sugar, sodium, and saturated fat are associated with increased risk of pediatric obesity.

It is actually during infancy, mainly when food transition from exclusively milk to nutrition that includes more semi-solid foods, when diet turns into a challenge in many occasions. In this stage is where many of the problems begin because, with the aim of feeding the child, it is likely to give non healthy foods which are tasty to the palate but end up having an addictive and counter-productive effect on the child. It is remarkable that, even with the important divulgation that exists nowadays and the public knowledge about the advantages

of a healthy nutrition, the epidemiologic data obtained through surveys reveal that between 6 and 11 months of age 25% children do not consume vegetables and 17% do not eat a single fruit during the day. From 11 months on the frequency and consumption of non-healthy food is every time higher.

Nevertheless, it is important to highlight the difficult task of battling against this situation because the increase of the epidemic observed in relation to the infancy obesity, does coincide with the marketing and already wide publicity of industrialized foods, the higher consumption frequency of snacks and the high-calory foods. Because the diet that a person follows is determined by a pattern of food consumption, and the diet itself is a risk factor that can be modified, trying to understand the different food patterns and the real influence that these pattern directly with the overweight and obesity becomes crucial. As long as it is not granted the corresponding value to the necessity of increasing the consumption of healthy foods rich in fibers and vitamins, leaving aside the excess sugar and fat, we are condemned to be witnesses of the silent and fatal impact from these excesses. Diseases like fat liver, diabetes, arterial hypertension or even lipid disorders, that where once considered "adulthood" diseases are now seen in infancy. In despite of this, these disease are secondary to bad nutrition habits, lack of physical activity and an increase of not healthy behaviors (use of computers, isolation, excessive use of technology) which are triggering an in advance time presentation of these diseases in relation to the age, together with the impact this produces. There are more children nowadays with adulthood diseases, revealing new clinical findings of chronicity and damage to target organs with biochemical variables altered. This study puts into evidence that people who adhere to dietary patterns full of fat, added sugar and addictive foods will be have more probabilities of developing overweight and obesity than those who do not follow these diet patterns.

It is highly important the vision the parents have about themselves in relation to their body image because this vision will be extrapolated to their sons and it is what will determine eventually the future of the son regarding nutrition and the healthy state or not. Parent's diet patterns and what they consider to be allowed to be included on the larder and therefore on family birthdays, show a direct relation with the physical aspect of the parent and the son. It is important to understand that the decisions we take about what we eat must be taken very seriously because these are tendency markers and can foresee probably future consequences that would modify the life quality.

Conclusion

1. The mere existence of some foods as a cultural habit of provision in the family, very significantly conditions the trend of overweight and obesity.
2. Foods given on birthdays' celebrations significantly determine the existence of overweight and obese children.
3. It impacts much more what is offered at home than what is offered on birthdays.
4. The higher the frequency attendance to fast food restaurants by children, the higher the number of overweight and obese children will be.
5. Mothers who perceive themselves of lesser volume from that observed by the operator do increase the overweight and obese children proportion.

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Conflicts of interest

Author declare that there is no conflict of interest.

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