57th ESPE 2018
Meeting ATHENS GREECE
27-29 September 2018

UCL
GREAT ORMOND STREET
INSTITUTE OF CHILD HEALTH

75 años
¡Haciéndolo mejor!

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INTRODUCTION.

Obesity is a major public health problem in Mexico. Several factors such as increased sedentarism, inactivity and poor quality diet have been described as explanations and described together as "obesogenic environment (OE)".

OBJECTIVE.

We aimed to describe the relationship between the components of OE and the adiposity (fat mass percentage) of Mexican children and adolescents.

METHODS.

We carried a population-based cross-sectional study of Mexican children/adolescents (6-17.9 years old). We recruited subjects from public and private schools of Mexico City and performed full paediatric and nutritional assessment to them. We collected data on diet habits by a 24-hour food intake survey, and time dedicated to activities of interest (i.e. screen, sleep, exercise). We further analysed diet habits on The Food Processor Nutrition Software. We measured adiposity by dual-energy X-ray absorptiometry (Lunar-iDXA) as percentage relative to total body weight.

We defined OE components as non compliance to:
- WHO recommendation on physical activity ≥ 60min/day.
- AAP recommendation on maximum daily time dedicated to screen of 2 hr.
- AAP recommendation on minimum sleep duration of 9 hr for children and 8 hr for adolescents.
- AHA "intermediate" or "poor" diet score according to recommendations on vegetables, fruits, fish, sodium, sugar-sweetened beverages and whole grains intakes.

We analysed the differences in adiposity between conventional BMI-groups and according to different frequencies of the OE components.

To assess the relationship between OE components and the adiposity, we performed a multi-linear regression analysis.

RESULTS.

We assessed 1,449 Mexican children/adolescents, whose general demographic characteristics are shown in table 1.

In plot 1 we show the frequency of different behaviours towards healthy recommendations divided into groups of children and adolescents.

Plot 1. Frequency of behaviours towards healthy recommendations divided by children and adolescents.
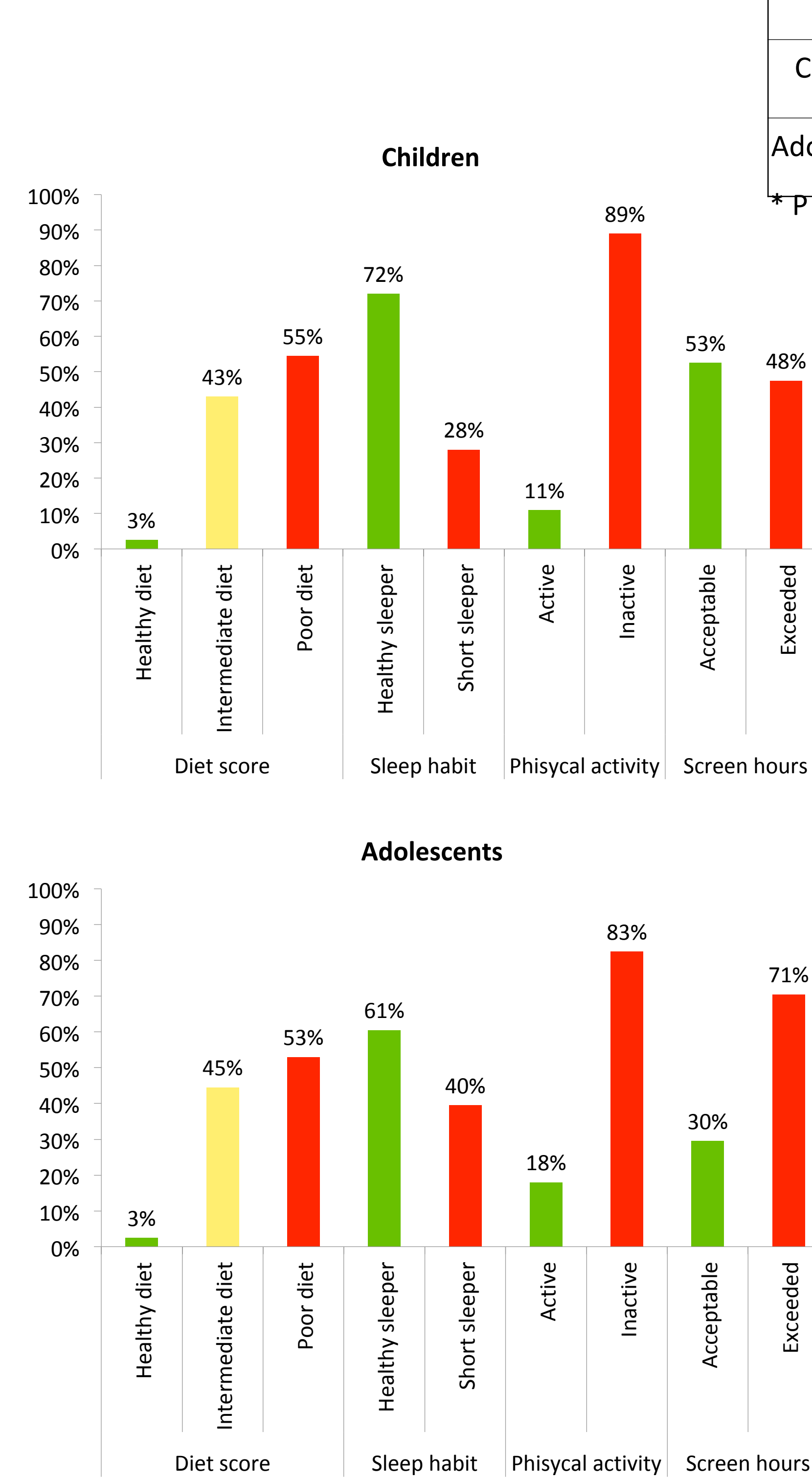
Plot 2. Proportion of subjects complying: none, 1, 2, 3, or all four healthy recommendations.
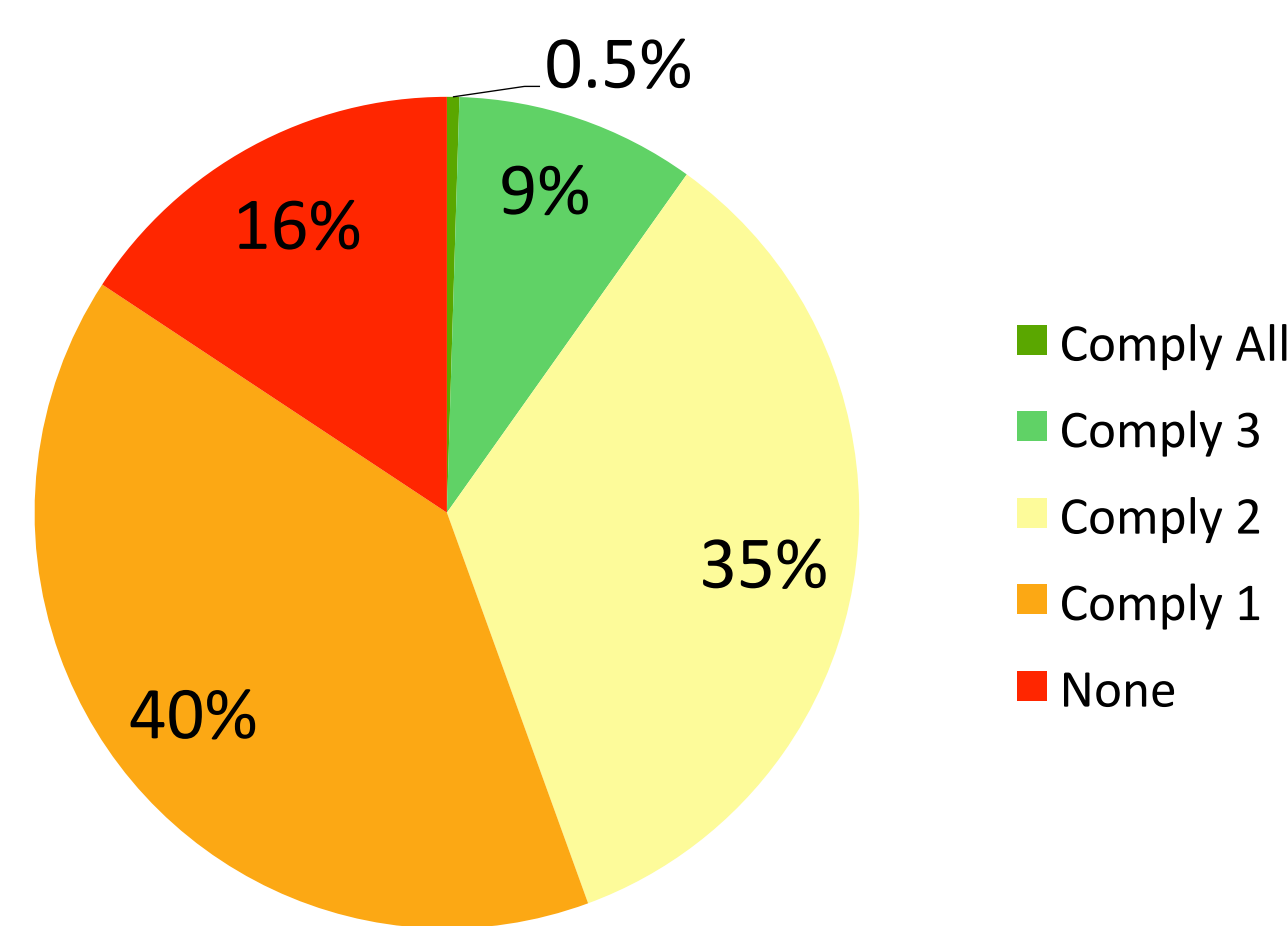

- Comply All
- Comply 3
- Comply 2
- Comply 1
- None

Figure 1. Differences in body composition in two 11 years males by DXA.

Table 1. General characteristics of the sample.

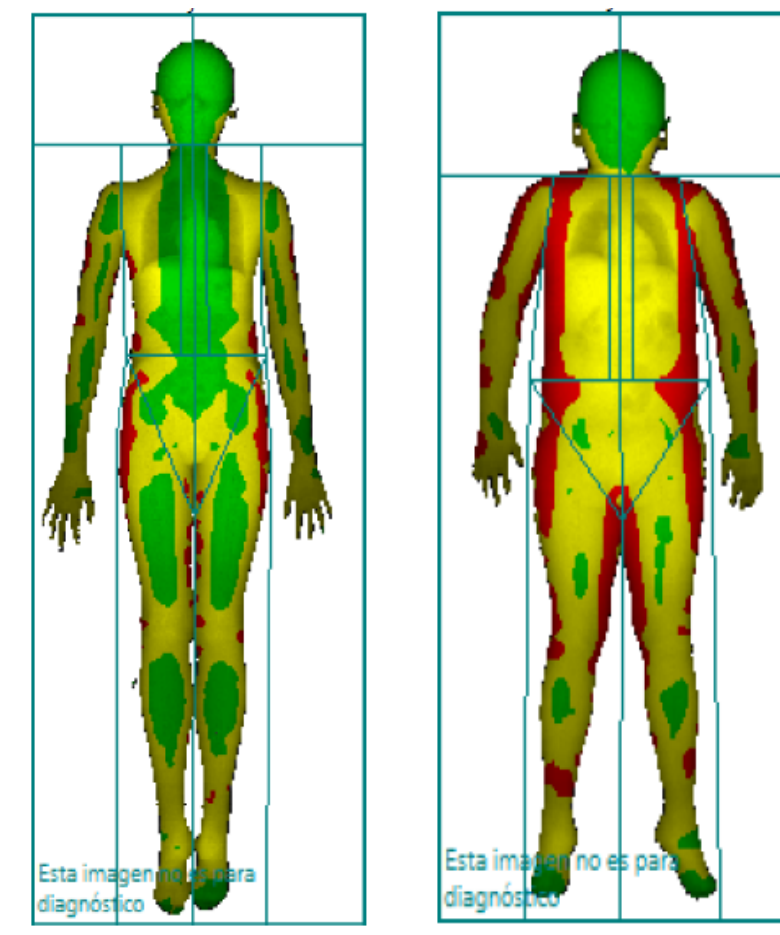| N = 1449	Children (800)	Adolescents (649)
Gender		
Male n (%)	349 (44%)	309 (48%)
Female n (%)	451 (56%)	340 (52%)
	Mean ± SD	
Age (years)	9.04 ± 1.64	14.83 ± 1.68
Weight (kg)	32.66 ± 11.21	57.02 ± 13.31
Height (cm)	132.18 ± 11.53	160.11 ± 9.16
BMI (kg/m2)	18.25 ± 3.85	22.12 ± 4.28
Systolic Blood Pressure (mmHg)	97.47 ± 7.73	105.37 ± 8.83
Diastolic Blood Pressure (mmHg)	60.8 ± 5.91	65.04 ± 5.85
Tanner puberal stage		
I	593 (74%)	16 (3%)
II	159 (20%)	52 (8%)
III	41 (6%)	151 (23%)
IV	7 (1%)	263 (41%)
V	0 (0%)	167 (26%)
Nutritional status by BMI		
Normal weight	500 (62%)	416 (64%)
Overweight	117 (15%)	117 (18%)
Obesity	144 (18%)	91 (14%)
Low weight	39 (5%)	25 (4%)

Table 2. Mean fat % of total body weight according to BMI classification, sex and age group.

Age Group	Gender	Underweight		Normal weight		Overweight		Obesity	
		Mean	CI 95%	Mean	CI 95%	Mean	CI 95%	Mean	CI 95%
Children	Female	25.1	23.4 26.7	30.6*	30 31.3	37.7*	36.4 39	43.2*	42 44.3
	Male	21	19.9 22.1	26.7*	26.1 27.3	34.4*	33.3 35.5	41.8*	40.9 42.7
Adolescents	Female	22.5	19 25.9	34*	33.3 34.7	40*	39.1 40.8	45.1*	43.9 46.2
	Male	17.8	16.3 19.3	21.8*	21 22.6	31*	29.2 32.7	37.9*	36.4 39.5

*All groups are statistical differents. (P adjusted by Bonferroni <0.05)

Table 3. Mean fat % differences according to compliance to healthy recommendations.

| Age group	Gender	Physical Activity		Screen time		Sleep		Diet score		
		active	inactive	Adequate	Exceeded	Healthy sleeper	Short sleeper	healthy diet	intermediate diet	poor diet
Children	female	27.3	34.08*	32.45	34.75*	33.56	33.41	30.85	33.95	33.32
	male	28.18	30.77*	29.57	31.38*	30.14	31.42	29.29	29.63	31.16
Adolescents	female	35	37.01	36.1	37.04	36.53	37.18	36.28	37.34	36.4
	male	22.1	25.88*	26.19	24.62	25.07	25.18	27.03	25.69	24.52

* P <0.05

As seen in Table 2 fat mass percentages increased significantly according to BMI-groups: underweight, normal weight, overweight and obesity, respectively.

In the independent annalysis for odds ratio for each component of OE, only the physical activity has risk for overweight/obesity OR 2.0 (95% CI 1.17-3.41 p0.01) for children, and OR 1.6 (95% CI 1.006-2.55 p0.04).

We observed a positive dose-response effect between non-compliance to healthy recommendations (i.e. OE) and fat mass percentage. (See Plot 3).

Plot 3. Mean fat mass percentage by cumulative uncompliance recomendations.

- Children female
- Children male
- Adolescents female
- Adolescents male
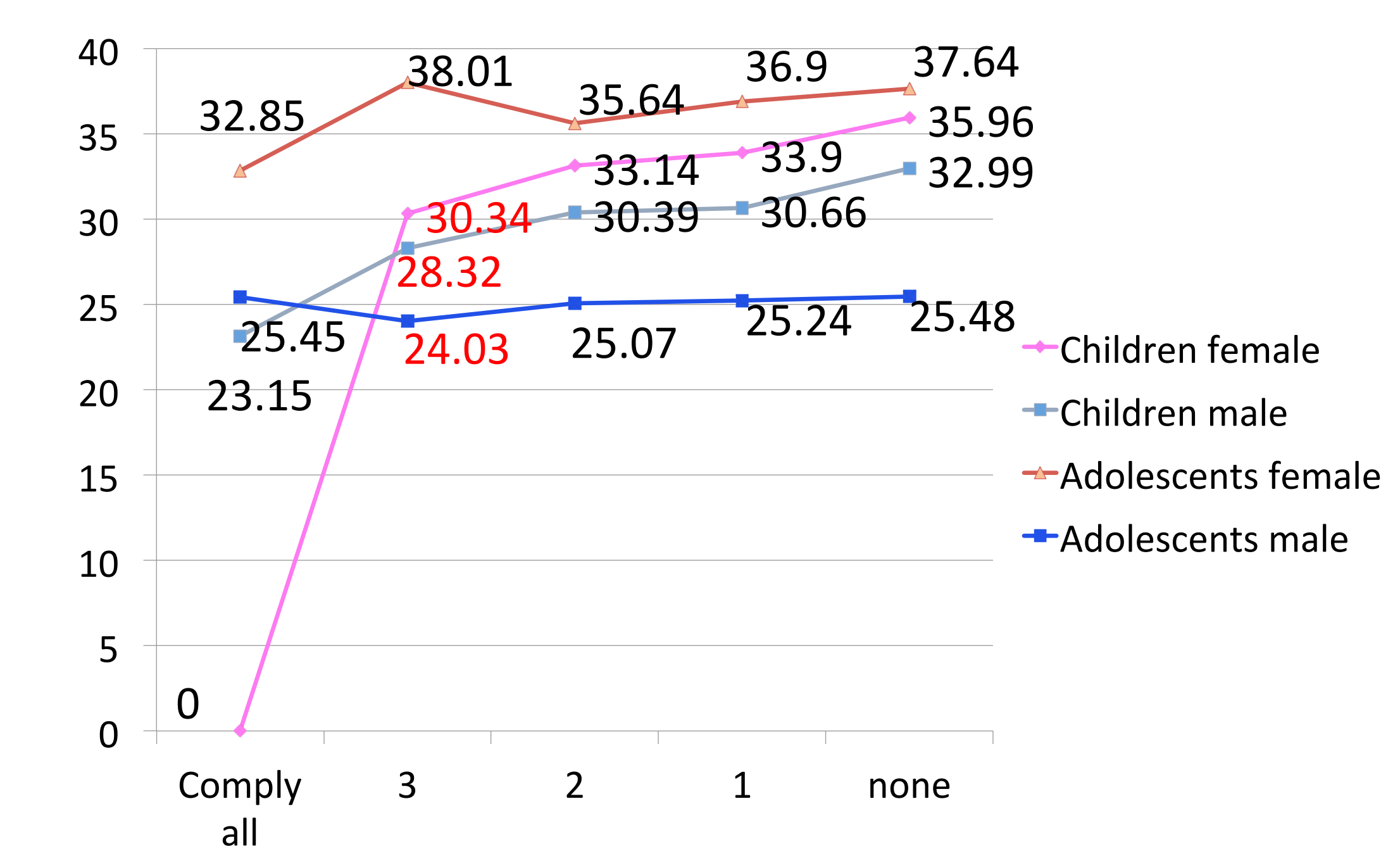
Multi-linear regression made evident the effect of each OE component on fat mass percentage: inactive and excess screen hours, β = 4%, 0.98%; P<0.05) adjusted by age and sex.

Table 5. Multiple linear regresion for Fat Mass percentage.

	B	*CI 95%*		*p*
(Constant)	38.93	35.94	41.93	0.0
Age (years)	-0.15	-0.28	-0.03	0.019
Sex (Male)	-6.46	-7.27	-5.65	0.000
Diet score (healthy)	-0.04	-0.77	0.68	0.911
Inactive	4.01	2.84	5.17	0.000
Exceed screen hours	0.98	0.14	1.82	0.022
Short sleeper	0.58	-0.29	1.45	0.194

CONCLUSIONS.

Mexican children/adolescents are growing in an OE, they show poor compliance to recommendations on healthy habits. Adequate physical activity and dietary intake are those that represent the biggest challenge.

The present study shows that habits such as physical activity, screen time, and diet quality have direct impact on adiposity of Mexican children. Educating families should be the key program to overcome this health problems.

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160--P2
57ESPE
Fat, metabolism and obesity
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Poster presented at:
PosterSessionOnline.com