



# Factors associated with overweight and childhood obesity in Spain according to the latest national health survey (2011)

*Fatores associados ao sobrepeso e à obesidade infantil na Espanha de acordo com o último inquérito nacional de saúde (2011)*

*Factores asociados al sobrepeso y la obesidad infantil en España, según la última encuesta nacional de salud (2011)*

María Julia Ajejas Bazán<sup>1</sup>

María del Carmen Sellán Soto<sup>2</sup>

Antonio Vázquez Sellán<sup>3</sup>

María Luisa Díaz Martínez<sup>2</sup>

Silvia Domínguez Fernández<sup>1</sup>

1. Universidad Complutense de Madrid.

Madrid, Spain.

2. Universidad Autónoma de Madrid. Madrid,

Spain.

3. Universidad Antonio Nebrija. Madrid, Spain.

## ABSTRACT

**Objective:** To describe the factors associated with overweight/obesity in Spain according to the latest National Health Survey (2011). **Method:** Descriptive cross-sectional study with 3,752 children aged 2 to 15 years (boys=2,007; girls=1,745). Main variables: overweight; obesity; gender; level of education of the head of the family; monthly income; hours of sleep; physical exercise; hours of TV and/or computer use; daily breakfast; parents' weight perception. Diagnostic criterion was based on WHO growth patterns, defined overweight with +1SD and obesity, +2SD. **Results:** Boys more obese than girls. Children whose parents had a lower level of education, those who did not practice physical activity and whose parents had an income of less than 900€ per month showed a higher percentage of overweight/obesity. **Conclusions:** Children whose parents had a lower education and monthly income presented a higher percentage of obesity. Sleeping the recommended hours and doing some type of physical activity reduces obesity.

**Keywords:** Epidemiology; Pediatric Obesity; Overweight; Risk Factors; Nursing.

## RESUMEN

**Objetivo:** Describir los factores asociados al sobrepeso/obesidad en España según datos de la última Encuesta Nacional de Salud (2011). **Métodos:** Estudio descriptivo transversal en población infantil de 2 a 15 años. Participaron 3752 individuos (niños n=2007 y niñas n=1745). Muestreo aleatorio polietápico estratificado. Principales variables: sobrepeso; obesidad; sexo; nivel de estudios del progenitor; ingresos mensuales; horas de sueño; ejercicio físico; horas de uso de televisión y/u ordenador; desayuno diario; percepción ponderal de los progenitores. Los criterios diagnósticos fueron los estándares de OMS, definiéndose sobrepeso con +1SD y obesidad, +2SD. **Resultados:** Niños más obesos que niñas. Niños/as cuyos progenitores presentaban un nivel de estudios bajo, niños/as que no hicieron ningún ejercicio y cuyos progenitores ganaron menos que 900€ mensuales presentaron un mayor sobrepeso/obesidad. **Conclusión:** Niños/as con progenitores con bajo nivel de estudios y de ingresos presentaron mayor obesidad. Dormir las horas recomendadas y hacer actividad física disminuye la obesidad.

**Palabras clave:** Epidemiología; Obesidad Pediátrica; Sobrepeso; Factores de Riesgo; Enfermería.

## RESUMO

**Objetivo:** Descrever os fatores associados com sobrepeso/obesidade na Espanha, segundo dados da última Pesquisa Nacional de Saúde (2011). **Método:** Estudo descritivo transversal com 3.752 crianças de 2 a 15 anos (meninos=2007; meninas=1.745). Principais variáveis: excesso de peso; obesidade; sexo; nível de escolaridade do chefe da família; renda mensal; horas de sono; exercício; horas de utilização da televisão e/ou computador; desjejum diário; percepção de obesidade dos pais. O diagnóstico baseou-se em padrões de crescimento da OMS, sendo o excesso de peso +1DP e a obesidade +2DP. **Resultados:** Meninos mais obesos que meninas. Crianças cujos pais tinham menos anos de estudo, aquelas que não praticam atividade física e cujos pais possuíam uma renda menor de 900 € mensal mostraram maior percentual de obesidade. **Conclusão:** Menor nível de escolaridade e baixa renda contribuem mais para a obesidade. Dormir as horas recomendadas e fazer algum tipo de atividade física reduz a obesidade.

**Palavras-chave:** Epidemiologia; Obesidade Pediátrica; Sobrepeso; Fatores de Risco; Enfermagem.

### Corresponding author:

María Julia Ajejas Bazán.

E-mail: majejas@ucm.es

Submitted on 10/29/2017.

Accepted on 01/17/2018.

DOI: 10.1590/2177-9465-EAN-2017-0321

## INTRODUCTION

In order to promote healthy environments in different age groups, from birth to adolescence, the International Network of Nursing in Child Health (ENSI Network/*Red ENSI*) promotes the need to know the epidemiological scenario of diseases prevalent in these age groups. One of the most important, due to its prevalence, is childhood obesity. Today, it is considered a public health problem and has increased especially in Europe.<sup>1</sup> According to the World Health Organization (WHO),<sup>2</sup> it is a chronic disease that has become an epidemic in some areas, with an overall estimate of 17.6% in children under five years of age. Recent studies in different countries show that 10.0% of all school-age children have excess body fat, which leads to an increased risk of developing chronic diseases.<sup>3,4</sup>

Among the reasons that led obesity to become a social problem, we have an increasing prevalence in the general population, reaching epidemic proportions, pathology of all age groups, its role as a predictor of adult obesity, and its links with associated morbidity and mortality.<sup>5,6</sup>

There is evidence on the relationship between overweight and risk factors that favor its emergence as the development of health problems.<sup>7</sup> Therefore, the study in children is important to know the likelihood that the disorders occurred in childhood persisted into adulthood.<sup>8</sup>

According to the different studies, the most important factors that determine the occurrence of overweight and obesity are gender, level of education of the parents/guardian, income level and factors related to lifestyle, such as daily breakfast, recommended sleep hours, the daily level of intense physical activity and the guardian's perception of the children's weight. The collection of these data is essential to prevent the onset of this disorder.<sup>8,9</sup> The nurses, among their activities, is the promotion of health. In Spain, those who occupy primary care centers in health centers are those directly related to promotion in the field of overweight (overweight and obesity). Knowing what are the factors that are directly related to weight gain in the child population is the key to promotion and prevention.

The data were obtained through the use of a very useful tool that is the National Health Survey (*Encuesta Nacional de Salud-ENS*). The ENS is a series of surveys that periodically provide information about citizens' health and some of the key factors that determine it. Currently, few studies have been done in Spain for this purpose. It should be noted what has been done by the Spanish Agency of Food and Nutritional Security (AECOSAN). It developed a study on the prevalence of childhood obesity, called the ALADINO (Food, Physical Activity, Child Development and Obesity) study during 2010-2015. These studies are included in the Childhood Obesity Surveillance Initiative (COSI) of the Office for the European Region of WHO.<sup>15</sup>

The objective of this study is to describe and analyze the main associated factors that influence overweight and obesity in children according to the latest National Health Survey (2011) and to assess whether this influence is different in boys and girls.

## METHOD

A retrospective descriptive study was conducted using data from the latest ENS (2011).<sup>10</sup> The survey reflects the health status of the Spanish population. It also provides information on aspects such as perceived morbidity, life habits, behaviors related to risk factors, use of health services and preventive measures.

The sample consisted of 3752 individuals (boys = 2007, girls = 1745), the age group ranged from 2 to 15 years, and stratified sampling was used in multiple stages.

The studied variables were overweight and obesity calculated with the data of weight and height provided by the parents in the Survey. Body mass index (BMI) was calculated. The diagnosis was made comparing the BMI with the growth patterns of the World Health Organization. They defined overweight with + 1SD and obesity with + 2SD.<sup>11,12</sup> The other variables were gender, the recommended hours of sleep (3-4 years of age: 12 hours, 4-5 years of age: 11 hours, 5-11 years of age: 10 hours, more than 11 years of age: 9 hours),<sup>9,13,14</sup> physical exercise (yes/no), hours of use of related technologies (< 2 hours and ≥ 2 hours),<sup>9,13,14</sup> breakfast habits (yes/no), level of education of tutors (illiterate - compulsory education, FP, no Bachelor, higher education), monthly income (< 900 €, 901-1800 €, 1801-3600 €, > 3600 €), parents' weight perception (much higher than normal, slightly above normal, normal, below normal).<sup>9,13,14</sup>

## STATISTICAL ANALYSIS

The variables to be analyzed were defined and labeled. The descriptive study was carried out through the distribution of frequencies for the different variables. In order to evaluate whether there was a statistically significant association ( $p < 0.05$ ) of the dependent variables with each of the independent variables, a bivariate analysis was performed using the Chi square test. Statistical processing of data was performed in SPSS (Statistical Package for the Social Sciences) software, version 21.0, for Windows.

## ETHICAL CONSIDERATIONS

Data were obtained from secondary sources (public and anonymous data, [www.ine.es](http://www.ine.es)). According to Spanish legislation, it was not necessary to obtain the approval of the Research Ethics Committee.

## RESULTS

Children whose parents had low level of education had a higher percentage of overweight (21.8% boys, 18.2% girls) and obesity (14.1% boys and 13.4% girls) than children whose parents had higher education level (overweight (19.4% boys and 14.9% girls) obesity 7.0% boys 8.7% girls) ( $p < 0.05$ ) (Table 1).

Regarding the hours of sleep, obesity was higher in children who did not sleep the recommended number of hours (13.6%

boys, girls 14.1%) compared to those who slept the recommended number of hours (7.4% boys, 8.3% girls) ( $p < 0.05$ ) (Table 1).

In relation to physical activity, children presented similar prevalences of overweight if they performed some type of physical activity (boys 20.9%, girls 17.5%) or not (boys 20.4%, girls 17.5%), and higher in boys rather than girls ( $p < 0.05$ ). On the other hand, obesity was higher among children who did not exercise (20.1% boys, 14.8% girls) compared to those who performed some physical activity (9.6% boys, 10.8% girls), with a statistically significant association only in boys (Table 1).

Children who spent more than two hours a day using devices related to new technologies were more overweight (24.5% boys, 20.0% girls) than those who spent less than two hours (20.7% boys, 15.0% girls), with no statistically significant association (Table 1).

Children whose families had a monthly income lower than € 900 were more obese (25.0% boys, 17.9% girls) than children whose families had a monthly income of € 3600 or more (10.2% boys, 8.5% girls) ( $p < 0.05$ ) (Table 1).

Children who ate breakfast daily had lower obesity values (10.9% boys, 11.7% girls) ( $p < 0.05$ ) than those who did not (31.6% boys, 5.9%) (Table 1).

Out of the total children who were obese, 16.4% (boys) and 14.0% (girls) were perceived by parents as children of normal weight ( $p < 0.05$ ) (Table 1).

## DISCUSSION

Regarding the parents' level of education, children whose guardians had lower levels of education had higher percentages of obesity than the others. In the enKid study, were obtained data similar to ours, with a prevalence of obesity of 15.6% in children whose parents had lower levels of education and 10.9% in those with higher levels of education.<sup>7,14</sup> Similar data obtained in the Aladino 2011 study, of the total overweight children 47.6% their parents only had elementary education and 41.2% had university studies.<sup>15</sup> Therefore, when the level of education is lower, the prevalence of obesity increases, perhaps due to the limited number of resources and limited knowledge of what constitutes a healthy diet or by the different appreciation of the concept of the desirable aesthetic standard. This is also consistent with the known fact that the educational level is one of the main predictors of health.<sup>16,17</sup>

Regarding the monthly income of each family, in the enKid<sup>7</sup> study data similar to ours was found, with a prevalence of obesity of 15.1% when the level of income was low and 12.0% when the level of income was high. Similar data were obtained by the Aladino 2011 study, of the total number of children with income below 1500 €, 50.1% were overweight and those receiving more than 2500 €, 39.5% were overweight.<sup>15</sup> Similarly, in the SEEDO study,<sup>18</sup> people from socioeconomically disadvantaged backgrounds had significantly higher prevalences of obesity than people from medium or high socioeconomic groups. A low socioeconomic level of tutors does not favor the adoption of

healthy lifestyles in their families.<sup>19</sup> On the other hand, it should be borne in mind that the occasions that favor the achievement of adequate physical activity and the practice of healthy eating are largely determined by social, economic and cultural factors that influence their access and availability. Another factor to be considered is the level of education of the head of the household that is directly related to the level of income and purchasing power of the family.

Therefore, in health promotion programs in primary care centers carried out by nurses, it is important to direct interventions related to a healthy diet for the parents.

Regarding the hours of sleep, children who did not sleep the recommended number of hours had a higher percentage of obesity. The most likely cause for children to sleep less is that they go to sleep later because they spend more time in front of the television or computer. Correcting this sleep deficit involves correcting this other widespread habit of staying up late to watch television.<sup>16,17</sup>

As for physical activity, children who performed some type of activity presented a lower percentage of obesity. It coincides with the enKid study (2000), with a national sample ( $n = 1723$ , 6-18 years), showing that more than half of the children and young people (53%) were below the recommended level of moderate-vigorous physical activity ( $< 60$  minutes/day), worsening in girls (61%).<sup>19</sup> There is a close relationship between sedentary leisure and lack of sleep. The most likely cause for children to sleep less is that they take longer to lie down because they spend more time in front of the television or computer. In educational terms, this means that children should not be watching television until the end of the program, but should go to bed at a predetermined time, regardless of what television programming currently offers. In the same way and by extension, having a television in the children's room only increases the likelihood of the child going to sleep much later.

That is why sleep control should also be taken into account in child health promotion campaigns.

No association was found between using more than two hours of devices and obesity. This contrasts with what has been found in other studies. For example, in Sweden, children who had a television in their bedrooms or who watched television more than 2 hours a day were more likely to be overweight/obese (OR 1.26 and 1.55, respectively).<sup>20</sup> This discrepancy could be due to the small number of children in this study who actually spent  $< 2$  hours per day on this activity. Likewise, the increase in the number of hours that children spend alone at home or with tutors, without the supervision of parents or educators of the time they spend on this activity, should be taken into account.

In relation to breakfast, children who did not eat breakfast had greater obesity than those who did. Similar results were found in the Aladino Study, in which out of the total number of children who did not eat breakfast, 2.7% were obese, compared to 1.4% who had normal weight.<sup>15</sup> Among the factors that may cause that sometimes they do not have breakfast, could be the lack of time, the time of the beginning of classes, the time they get up, the time

**Table 1.** Distribution of the weight according to variables and gender (2011).

		Normal			Overweight			Obesity		
		Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Parents' level of education	Illiterates, compulsory education	609 (64.1)	562 (68.4)	1171 (66.2)	207 (21.8)*	150 (18.2)*	357 (40.0)*	138 (14.1)*	110 (13.4)*	248 (27.5)*
	FP, no Bachelor	492 (70.6)	416 (71.4)	908 (71.0)	142 (20.4)*	104 (17.8)*	246 (38.2)*	63 (9.0)*	68 (10.8)*	131 (19.8)*
	Higher education	262 (73.6)	256 (76.4)	518 (75.0)	69 (19.4)*	50 (14.9)*	119 (34.3)*	25 (7.0)*	29 (8.7)*	54 (15.7)*
Recommended sleep	No	794 (66.9)	707 (70.8)	1501 (68.8)	232 (19.5)	150 (15.0)	382 (34.5)	161 (13.6)*	141 (14.1)*	302 (27.7)*
	Yes	573 (69.9)	530 (71.0)	1103 (70.4)	186 (22.7)	155 (20.7)	341 (43.4)	61 (7.4)*	62 (8.3)*	123 (15.7)*
Physical Exercises	No	163 (59.5)	251 (67.7)	414 (63.6)	56 (20.4)*	65 (17.5)*	121 (37.9)	56 (20.1)*	111 (14.8)	111 (34.9)
	Yes	1204 (69.5)	984 (71.7)	2188 (70.6)	362 (20.9)*	240 (17.5)*	602 (38.4)	166 (9.6)*	150 (10.8)	316 (20.4)
Hours of use of devices related to technologies	≤ 2 h	1001 (72.4)	887 (85.0)	1888 (78.7)	173 (20.7)	94 (15.0)	267 (17.8)	61 (6.9)	40 (0.0)	101 (6.9)
	> 2 h	472 (66.9)	363 (71.0)	835 (68.9)	206 (24.5)	181 (20.0)	(22.3)	8.6.	178 (9.1)	3781 (8.8)
Monthly Income	< 900 €	150 (53.6)	363 (60.5)	343 (57.2)	(21,4)	69 (21.6)	129 (21.5)	70 (25.0)*	57 (17.9)*	127 (21.2)
	901-1800 €	295 (54.0)	306 (62.3)	601 (57.9)	343 (26.7)	250 (23.2)	493 ± 25	213 (19.3)*	188 (14.5)*	401 (17.1)
	1801-3600€	151 (57.6)	185 (66.5)	336 (62.1)	111 (25.7)	(21.7)	210 (23.7)	143 (16.7)*	104 (11.9)*	247 (14.2)
	> 3600 €	379 (79.0)	(71.1)	665 (75.3)	42 (10.8)	75 (20.4)	117 (15.2)	(10.2)	(8,5)	83 (9.4)
Breakfast	No	5 (26.3)	14 (82.4)	19 (54.3)	8 (42.1)	2 (11.8)	10 (53.9)	6 (31.6)	1 (5.9)	7 (37.5)
	Yes	1362 (68.5)	1223 (70.8)	2585 (69.6)	410 (20.6)	303 (17.5)	713 (38.1)	216 (10.9)*	202 (11.7)*	418 (22.6)
Parents' weight perception	Reasonably larger than normal	1 (5.6)	1 (6.3)	2 (5.8)	6(33.3)	5 (31.3)	11 (32.3)	11 (61.1)	10 (62.5)	21 (61.7)
	Slightly above normal	33 (16.3)	55 (31.8)	(23.4)	65 (32.2)	62 (35.8)	127 (33.9)	104 (51.5)*	56 (32.4)*	160 (42.6)*
	Normal	1016 (57.9)	1002 (66.9)	2018 (62.1)	508 (25.8)	322 (19.1)	830 (22.6)	263 (16.4)*	232 (14.0)*	495 (15.2)*
	Below normal	181 (89.2)	120 (90.9)	301 (89.9)	15 (7.4)	6 (4.5)	(6,3)	7 (3.4)	6 (4.5)	13 (3.9)

Source: own elaboration based on the data of the National Health Survey (2011), \* p < 0.05.

they go to sleep and the time in which they prepare the backpack. Therefore, it would be advisable to emphasize the importance of making an adequate breakfast for school aged children and adolescents in the programs that promote healthy eating.

Currently, in the Community of Madrid, the "Healthy Breakfast" project is included in the Community's Comprehensive Food and Nutrition Plan, which, among other actions, aims to promote healthy eating habits that improve the nutritional situation of the population.

High percentages of children with overweight were observed 22.6% (boys 25.8%, girls 19.1%) and obese children 15.2% (boys 16.4%, girls 14.0%) perceived by their parents as children of normal weight. It was also found in another study<sup>21</sup> conducted in pre-school aged children; one out of five parents of obese children recognized their children's overweight. The research conducted by Etelson<sup>22</sup> was found in representative samples of children from 4 to 8 years of age. In 59.4% of parents of overweight children are not perceived as such. Also, the authors Moore and Harry<sup>23,24</sup> in their study showed that it was easier to treat children that their parents acknowledged being overweight. Similarly, a study in Saudi Arabia<sup>25</sup> confirms our results. Our study showed that parents who have overweight children systematically estimate that children's weight is lower, although our study did not focus on the reasons for these perceptions.<sup>24</sup> These data are an obstacle to the prevention and treatment of excess weight.

## CONCLUSIONS

Children whose parents have a low level of education and low monthly income presented a higher percentage of obesity. Sleeping the recommended hours of sleep decreases the prevalence of obesity. Doing some kind of physical activity is associated with significantly lower levels of obesity. Eating breakfast daily is associated with lower levels of obesity. The weight perception of the parents of obese children was slightly lower than the objective measuring.

In the health promotion programs carried out by nurses, interventions should be directed to the parents and oriented to healthy eating and breakfast, promotion of physical exercises and control of hours of sleep.

## REFERENCES

- Brettschneider AK, Schienkiewitz A, Schmidt S, Ellert U, Kurth BM. Updated prevalence rates of overweight and obesity in 4- to 10-year-old children in Germany. Results from the telephone-based KiGGS Wave 1 after correction for bias in parental reports. *Eur J Pediatr* [Internet]. 2017 Apr; 176(4):547-51. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/28132095>. DOI: 10.1007/s00431-017-2861-8.
- World Health Organization (WHO). Health Impact Assessment Methods and Strategies. Geneva: World Health Organization; 2013. Available from: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0011/261929/Health-in-Impact-Assessments-final-version.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0011/261929/Health-in-Impact-Assessments-final-version.pdf?ua=1)
- Kosti RI, Panagiotakos DB. The epidemic of obesity in children and adolescents in the world. *Cent Eur J Public Health* [Internet]. 2006; 14(4):151-9. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/17243492>
- World Health Organization (WHO). Global strategy on diet, physical activity and Health. Geneva: World Health Organization; 2004.
- Aksghlaede L, Juul A, Olsen LW, Sørensen TI. Age at puberty and the emerging obesity epidemic. *PLoS One* [Internet]. 2009 Dec; 4(12):e8450. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/?term=Age+at+Puberty+and+the+Emerging+Obesity+Epidemic>
- Wang Y, Lobstein T. Worldwide trends in childhood overweight and obesity. *Int J Pediatr Obes* [Internet]. 2006; 1(1):11-25. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/17902211>
- Serra-Majem L, Aranceta Bartrina J, Pérez-Rodrigo C, Ribas-Barba L, Delgado-Rubio A. Prevalence and determinants of obesity in Spanish children and young people. *Br J Nutr* [Internet]. 2006 Aug; 96 Suppl 1:S67-72. Available from: [https://www.ncbi.nlm.nih.gov/pubmed/?term=Prevalence+and+determinants+of+obesity+in+Spanish+children+and+young+people.+Br+J+Nutr.+2006%3B96\(1\)%3A67%E2%80%9372](https://www.ncbi.nlm.nih.gov/pubmed/?term=Prevalence+and+determinants+of+obesity+in+Spanish+children+and+young+people.+Br+J+Nutr.+2006%3B96(1)%3A67%E2%80%9372)
- Vázquez IA, Zapico RB, Rodríguez CR. La obesidad infantil como resultado de un estilo de vida obesogénico. *Endocrinol Nutr* [Internet]. 2007 Dec; 54(10):530-4. Available from: <https://www.sciencedirect.com/science/article/pii/S157509220715000>
- Lopez JN, Ramirez JP, Sanchez PM. La otra cara de la obesidad: reflexiones para una aproximación sociocultural. *Ciênc Saude Coletiva* [Internet]. 2014; 19(6):1721-9. Available from: [http://www.scielo.br/scielo.php?pid=S1413-81232014000601721&script=sci\\_abstract&lng=es](http://www.scielo.br/scielo.php?pid=S1413-81232014000601721&script=sci_abstract&lng=es)
- Ministerio de Sanidad Servicios Sociales e Igualdad. Encuesta Nacional de Salud 2011 [Internet]. Available from: <http://pestadistico.inteligenciadegestion.mssi.es/publicoSNS/comun/ArbolNodos.aspx>
- World Health Organization. BMI for age BOYS. 2007. [Internet]. Available from: [http://www.who.int/growthref/bmifa\\_boys\\_5\\_19years\\_z.pdf?ua=1](http://www.who.int/growthref/bmifa_boys_5_19years_z.pdf?ua=1)
- World Health Organization. BMI for age GIRLS. 2007. [Internet]. Available from: [http://www.who.int/growthref/bmifa\\_girls\\_5\\_19years\\_z.pdf?ua=1](http://www.who.int/growthref/bmifa_girls_5_19years_z.pdf?ua=1)
- Oliveira A, Monteiro Â, Jácome C, Afreixo V, Marques A. Effects of group sports on health-related physical fitness of overweight youth: A systematic review and meta-analysis. *Scand J Med Sci Sports* [Internet]. 2017 Jun; 27(6):604-11. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/?term=Effects+of+group+sports+on+healthrelated+physical+fitness+of+overweight+youth%3A+A+systematic+review+and+meta-analysis>.
- Briceño S, Rodríguez Salón R, Mejías O, Mejías A, Parilli M, Zambrano J. Una mirada sociológica al sobrepeso y la obesidad como problemas de salud, producto de la crisis de sentido moderna. *Rev Derecho Reforma Agraria Ambient Soc* [Internet]. 2014; 40:17-41. Available from: <http://erevistas.saber.ula.ve/index.php/revistaagrar/article/view/6503/6313>
- Estudio Aladino: Estudio de Vigilancia del Crecimiento, Alimentación, Actividad Física, Desarrollo Infantil y Obesidad en España 2011. Agencia Española de Seguridad Alimentaria y Nutrición. Ministerio de Sanidad, Servicios Sociales e Igualdad. Agencia Española de Seguridad Alimentaria y Nutrición; 2013. Available from: [http://www.aecosan.mssi.gob.es/AECOSAN/docs/documentos/nutricion/observatorio/estudio\\_ALADINO\\_2011.pdf](http://www.aecosan.mssi.gob.es/AECOSAN/docs/documentos/nutricion/observatorio/estudio_ALADINO_2011.pdf)
- Wang S, Schwartz MB, Shebl FM, Read M, Henderson KE, Ickovics JR. School breakfast and body mass index: a longitudinal observational study of middle school students. *Pediatr Obes* [Internet]. 2017 Jun; 12(3):213-20. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/?term=School+breakfast+and+body+mass+index%3A+a+longitudinal+observational+study+of+middle+school+students>
- Vázquez IA, Zapico RB, Díez JH, Rodríguez CF. Actividad Física, ocio sedentario, falta de sueño y sobrepeso infantil. *Psicothema* [Internet]. 2008; 20(4):516-20. Available from: <http://www.psicothema.com/psicothema.asp?id=3516>

18. Aranceta J, Pérez Rodrigo C, Majem LS, Barba LR, Izquierdo JQ, Vioque J, et al. Prevalencia de la obesidad en España: resultados del estudio SEEDO 2000. *Med Clín [Internet]*. 2003; 120(16):608-12. Available from: <https://www.sciencedirect.com/science/article/pii/S0025775303737877#!>
19. de Schweinitz PA, Wojcicki JM. First Nations Approaches to Childhood Obesity: Healthy Lifestyles in Canada Compared with Alternatives for Alaska Native Communities. *Children (Basel) [Internet]*. 2017 May 11; 4(5): pii:E38. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/?term=First+Nations+Approaches+to+Childhood+Obesity%3A+Healthy+Lifestyles+in+Canada+Compared+with+Alternatives+for+Alaska+Native+Communities>
20. Garmy P, Clausson EK, Nyberg P, Jakobsson U. Overweight and television and computer habits in Swedish school-age children and adolescents: a cross-sectional study. *Nurs Health Sci [Internet]*. 2014 Jun; 16(2):143-8. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/?term=Overweight+and+television+and+computer+habits+in+Swedish+school-age+children+and+adolescents%3AA+cross-sectional+study.+Nursing+and+Health+Sciences.+2014%3B16%2C+143%E2%80%93148>
21. Stamatakis E, Wardle J, Cole TJ. Childhood obesity and overweight prevalence trends in England: evidence for growing socioeconomic disparities. *Int J Obes (Lond) [Internet]*. 2010 Jan; 34(1):41-7. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/?term=Childhood+obesity+and+overweight+prevalence+trends+in+England%3A+evidence+for+growing+socioeconomics+disparities>
22. Etelson D, Brand DA, Patrick PA, Shirali A. Childhood Obesity: do Parents Recognize This Health Risk? *Obes Res [Internet]*. 2003 Nov; 11(11):1362-8. Available from: [https://www.ncbi.nlm.nih.gov/pubmed/?term=Childhood+Obesity%3A+Do+Parents+Recognize+This+Health+Risk%3F+Obesity+research+2003%3B11\(11\)%3A1362-1368](https://www.ncbi.nlm.nih.gov/pubmed/?term=Childhood+Obesity%3A+Do+Parents+Recognize+This+Health+Risk%3F+Obesity+research+2003%3B11(11)%3A1362-1368)
23. Baughcum AE, Chamberlin LA, Deeks CM, Powers SW, Whitaker RC. Maternal perceptions of overweight preschool children. *Pediatrics [Internet]*. 2000 Dec; 106(6):1380-6. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/?term=Maternal+perceptions+of+overweight+preschool+children.+Pediatrics.+2000%3B106%3A1380%E2%80%931380>
24. Moore LC, Harris CV, Bradlyn AS. Exploring the relationship between parental concern and the management of childhood obesity. *Matern Child Health J [Internet]*. 2012 May; 16(4):902-8. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/21594667>
25. Aljunaibi A, Abdulle A, Nagelkerke N. Parental weight perceptions: a cause for concern in the prevention and management of childhood obesity in the United Arab Emirates. *PLoS One [Internet]*. 2013; 8(3):e59923. Available from: [https://www.ncbi.nlm.nih.gov/pubmed/?term=25.%09Aljunaibi+A%2C+Abdulle+A%2C+Nagelkerke+N.+Parental+Weight+Perceptions%3A+A+Cause+for+Concern+in+the+Prevention+and+Management+of+Childhood+Obesity+in+the+United+Arab+Emirates+2013.+PLoS+ONE+8\(3\)%3A+e59923](https://www.ncbi.nlm.nih.gov/pubmed/?term=25.%09Aljunaibi+A%2C+Abdulle+A%2C+Nagelkerke+N.+Parental+Weight+Perceptions%3A+A+Cause+for+Concern+in+the+Prevention+and+Management+of+Childhood+Obesity+in+the+United+Arab+Emirates+2013.+PLoS+ONE+8(3)%3A+e59923). DOI: 10.1371/journal.pone.0059923
26. Binkin N, Spinelli A, Baglio G, Lamberti A. What is common becomes normal: the effect of obesity prevalence on maternal perception. *Nutr Metab Cardiovasc Dis [Internet]*. 2013 May; 23(5):410-6. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/22212600>