Original Article

Comparative Study of Lifestyle: Eating Habits, Sedentary Lifestyle and Anthropometric Development in Spanish 5- To 15-yr-Olds

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Abstract

Background: The infant-juvenile period is one of high vulnerability during the lifestyles chosen become determining factors for future health status. This study aimed to evaluate lifestyle, specifically eating habits and physical activity, in 5-15-year-olds in Spain and their health status (anthropometry).

Methods: This cross-sectional population study with two time points (2006 and 2013) was conducted by compiling data from the Spanish National Health Survey. We used the minor survey, specifically the data from the Health Determinants module, which included 5-15-year-olds. Compiled information was obtained from parents or guardians.

Results: The overall overweight and obesity prevalence in Spain (2013) in 5- to 15-year-olds is 24.3%. A drop of 8.2% in meat consumption was found, while overall intake was high. Daily intake of plant-based food (fruit, vegetables, pulses) was low, especially vegetables (32.9%). Increased sedentary lifestyle was observed, probably because the use of communication technologies has increased in recent years (*P*<0.001). Moreover, watching TV rose to 19.3% for 1 hour/day watching TV on weekdays and to 23.5% at weekends.

Conclusion: When comparing the two time points (2006 and 2013), we observed that lifestyle, eating habits and physical activity strongly associated with the Spanish infant-juvenile population's anthropometry. Mediterranean diet patterns seem to be abandoned and physical activity is practiced less, which will have a negative impact on future quality of life.

Keywords: Lifestyle, Eating habits, Sedentary, Children, Obesity

Introduction

Lifestyles are considered to interact between life conditions and individual patterns of conduct, which are determined by socio-cultural factors and individuals' personal characteristics, according to WHO (1). These factors include conducts and preferences related with food types, physical activity, recreational activities and consumption patterns (2). Living an inadequate lifestyle in infancy can favour increased body weight, which, in recent years, has been related with a higher overweight and obesity prevalence (3). The enKid

study (1998-2000) respectively reported a prevalence of 13.9% and 12.4% for obesity and being overweight in Spanish children, with obesity being higher in males (15.6%) than in females (12%), and if this trend continues, an overall level of 9.1% will be reached by 2020 (4). A balanced diet in childhood and adolescence is crucial for well-being and growth, but also for establishing dietary habits that will persist later in life (5). The nutrition transition, associated with rapid demographic and socio-economic change, has increased the risk

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of obesity in childhood, as excessive intake of refined foods with high concentrations of sugars, fats and energy, and low intake of fibre, pulses, fruit and vegetables (6). This change inevitably affect choice of processed foods, mainly of animal origin, which means loss of traditional eating patterns, and increased use of technology, which encourages sedentary activity (7, 8). In Spain, the Mediterranean diet is characterised for a wide variety of foods and nutrients that reduce morbidity and mortality (9), and for lowering the prevalence of processes related to cardiovascular diseases (CVD) and metabolic syndrome, among other (10-12). Breakfast is considered one of the most important meals of the day as it has an impact on general health and academic performance (13). In Spain, 10-15% of children do not eat breakfast before school, or 20-30% does not eat full breakfast (14).

The term sedentary lifestyle is used to characterise reduced energy expenditure through lack of or reduced physical activity, and is associated with substantial health consequences (15). It is also linked with modern society lifestyles, which have drifted towards sedentary habits that are more harmful for health (16). New media technologies, such as television (TV), computers and games consoles, have provided new opportunities for sedentary activity (17). The American Academy of Paediatrics recommends removing TV sets from children's bedrooms and not spending more than 2 hours/day on sedentary activities (18).

This study aimed to evaluate the factors that influence lifestyle by centring on diet quality and sedentary activities by assessing the causes and effects they have on Spanish 5- to 15-year olds' anthropometry for the two periods corresponding to the last two Spanish National Health Surveys (ENSE; 2006 and 2013).

Material and Methods

Study design
To conduct this study, Spanish National Health Surveys (ENSE) data were used from two the last time points, 2006 and 2013 (carried out by the Spanish National Statistics Institute (INE) with the collaboration of the Spanish Ministry of Health, Social Services and Equality). The sample sizes of these surveys were 9,122 and 5,495 Spanish 5- to 15-year-old in 2006 and 2013, respectively. Both surveys included a 1-year data collection, and both gender-stratified periods were compared. This study was cross-sectional and employed self-referral data.

Sample design
The ENSE sample design is a three-stage stratified kind divided into three stages: a) the units from the first stage are the census sections grouped into strata according to the size of the town they belong to; b) the units from the second stage are the main family homes from each section selected for the sample; and c) the units in the third stage are selected from the list of the survey able people at home when the interview was held (19, 20).

To select the sample: a) those sections grouped as strata were selected with a proportional probability according to their size; b) in each section, homes were selected with the same probability by means of systematic, but aleatory, sampling, which allows self-weighted samples to be obtained in each stratum; c) the person who completed the questionnaire for minors was an adult, who was selected by an aleatory procedure which assigns equal probability to all the adults at the given home (19, 20).

Survey design
ENSE is divided into three surveys: I) the home survey; II) the adults' survey; and III) the minors' survey. For this study, only the minors' survey data were used, specifically the data from the Health Determinants module, in which the following were employed: a) body mass index in a child population; b) time spent watching TV each day; c) time spent playing with video games, computers or the Internet each day; d) type of breakfast eaten; e) consumption pattern of certain food items (21, 22).

Independent variables
The lifestyle-related factors were divided into two groups. Variables like type of breakfast and fre-

quency of food intake were included with the following questions: 1) What do you normally eat for breakfast? and 2) How often do you eat the following foods?. The variable of time spent watching TV and playing video games was included with the following questions: 3) How much time do you spend more or less watching TV a day? and 4) How much time do you spend more or less playing with video games or using a computer a day (including social networks, messenger, chats, consoles etc.)?, on weekdays and at weekends (21, 22).

Dependent variables

Height (cm) and weight (kg) were obtained by asking parents/guardians the following questions: 5) Could you tell me how much your child weighs more or less with no clothes or shoes on? and 6) How tall is your child more or less with no shoes on?

Body mass index (BMI, kg/m^2) was calculated and classified using the cut-off points according to Cole et al. Normo-weight was defined as <18.5-24.9kg/m^2, overweight as 25-29.9 kg/m^2 and obesity as ≥30 kg/m^2 (21, 22).

Statistical methods

A data matrix was constructed using data published by INE and by selecting the data required for the study, and the two study periods were analysed. Any data not specified in the final samples were not included. Firstly, a new database was created with the selected variables. Next, a descriptive univariate analysis was carried out with the collected variables using absolute and relative frequencies (percentages) for the qualitative variables.

The means, medians, maximums, minimums and standard deviations were employed for the quantitative variables, which were stratified by gender. The χ2 test was used to check the differences in the percentages of the dichotomic and categorical variables. In all cases, the threshold of statistical significance was set as $P < 0.05$. All the data analyses were done using the SPSS v.19.0. programme (SPSS, Inc., Chicago, IL, USA).

Results

Table 1 classifies the selected sample according to BMI. After checking both periods, the overweight and obesity prevalances did not change. A 3.1% increase in the normo-weight group of the whole sample was found ($P <0.05$), and a 4.9% improvement was observed among males ($P <0.05$). The data from the 2013 period show a significant increase in normo-weight prevalence in males (57.9%) and females (56.8%), and a 0.9% increase in overweight prevalence.

Table 2 provides details of the type of breakfast eaten for the two study periods. There was an 11.1% increase in choosing liquid (milk, juice) and solid (bread, toast, biscuits, cereals, sweetmeats) food, which were significant for the whole sample and for genders. A 5.3% reduction was found in eating a full breakfast (liquid + solid + fruit). During the 2013 period, a significant increase in choosing the 1 liquid + 1 solid breakfast type was seen in both males (67.3%) and females (67.2%), but choice of eating a full breakfast lowered (10.5%).

Table 1: Evaluation of Body Mass Index according to sex in children aged 5 to 15

Variables	2006 Total (*n*=4322) n(%)	2013 Total (*n*=4830) n(%)	*P*	2006 Males (*n*=2234) n(%)	2013 Males (*n*=2483) n(%)	*P*	2006 Females (*n*=2087) n(%)	2013 Females (*n*=2347) n(%)	*P*
Low/ Normo-weight <18.5-24.9kg/m²	2334.9(54.2)	2770.3(57.3)	0.026	1184.7(53.0)	1436.9(57.9)	0.013	1160.3(55.6)	1333.1(56.8)	0.551
Overweight 25-29.9 kg/m²	691.6(16.0)	815.6(16.9)	0.651	379.6(17.0)	441.6(17.8)	0.802	311.9(14.9)	374.1(15.9)	0.721
Obesity ≥30 kg/m²	320.0(7.4)	355.4(7.4)	0.930	172.3(7.7)	181.9(7.3)	0.892	148.1(7.1)	173.5(7.4)	0.977

n: calculated in thousands of people units

Table 2: Breakfast type according to gender in 5- to 15-year-olds

Variables	2006 Total (*n*=4730) n(%)	2013 Total (*n*=4830) n(%)	*P*	2006 Males (*n*=2442) n(%)	2013 Males (*n*=2483) n(%)	*P*	2006 Females (*n*=2287) n(%)	2013 Females (*n*=2347) n(%)	*P*
Breakfast type									
Liquid only	470.3(10.1)	380.4(7.9)	0.287	204.0(8.5)	193.1(7.8)	0.837	266.3(11.9)	187.2(8.0)	0.168
Liquid only and fruit	71.8(1.6)	26.8(0.6)	-	28.1(1.2)	12.4(0.5)	-	43.6(2.0)	14.4(0.6)	-
Liquid only and solid*	2607.2(56.2)	3248.9(67.3)	<0.001	1433.2(59.9)	1672.0(67.3)	<0.001	1174.0(52.3)	1576.0(67.2)	<0.001
Liquid, fruit and solid*	732.6(15.8)	506.0(10.5)	0.067	367.8(15.4)	263.9(10.6)	0.076	364.8(16.3)	242.1(10.3)	0.040
Other breakfast	669.6(14.5)	614.0(12.7)	0.349	330.2(13.8)	316.6(12.8)	0.631	339.5(15.1)	297.4(12.7)	0.412
Nothing	84.3(1.8)	54.6(1.1)	0.696	29.5(1.2)	25.1(1.0)	-	54.8(2.4)	29.5(1.3)	-

* bread, toast, biscuits, cereals, sweetmeats

n: calculated in thousands of people units

Table 3 reflects intake of food by comparing both periods. We can see a statistically significant reduction in the daily intake of meat, 8.2%; dairy products, 3.8%; pasta, rice and potatoes, 4.9%; bread and cereals, 4.6%; soft drinks, 6.7%. Increase of 5.1% for intake of eggs once/twice a week, 7.9% for eating vegetables daily, and 5.9% for pulses once/twice a week were found. Intake of fish, fruit and sweetmeats remained the same after comparing both periods. The data from the 2013 period show that intake of fish of 3 times/week was low (37.5%), and the same applied to daily intake of vegetables (36.8%) and fruit (60.3%). Daily intake of sweetmeats remained high (45.9%), with similar data to the 2006 period. Drinking soft drinks on a daily basis dropped (11.1%) significantly during the 2013 period, while never or hardly ever-drinking soft drinks increased (39.9%).

Table 4 shows the time spent using communication technologies after comparing both study periods. Watching TV for ≥ 1 hour/day increased to 19.3% on weekdays and to 23.4% at weekends in the whole sample and for genders. Using a computer and video console for ≥ 1 hour/day increased (*P*<0.001) to 10.5% on weekdays and to 25.0% at weekends in the whole sample and for genders. During the 2013 period, the data revealed the habit of watching TV for ≥1 hour/day on weekdays for 70.1% and for 82.3% at weekends, and this increase was similar for both genders.

The results for using computers and video-game consoles show that 30.8% spend ≥1 hour/day on weekdays and 54.1% at weekends. Another finding was that males use them more on weekdays (34.2%) and females do so more at weekends (46.6%).

Discussion

We found in our results that eating habits improved when we compared the alimentation in Spanish 5- to 15-year-olds in 2006 with 2013, but BMI did not change significantly, it could be for tendency of reduce physical exercise or increase of sedentary style life of this culture.

In the last decade, society has faced a series of modifications that have acted on its lifestyles, and an impact on health has been seen (23). Globalisation has had a direct influence on changes in diet patterns, with a shift from a diet rich in carbohydrates and fibre to one rich in fats and sugars. Consequently, the nature of the diseases that the population suffers has shifted to malnutrition due to excess and higher cardiovascular risk (23).

This modification in food intake has implied abandoning basic, traditional foods to select more meat products, dairy products, vegetable oils (coconut and palm), salt and sugar. All of this has disparate effects on different population groups (23).

Table 3: Food intake frequency according to gender in 5- to 15-year-olds

Variables	2006 Total (*n*=4730) n(%)	2013 Total (*n*=4830) n(%)	*P*	2006 Males (*n*=2442) n(%)	2013 Males (*n*=2483) n(%)	*P*	2006 Females (*n*=2287) n(%)	2013 Females (*n*=2347) n(%)	*P*
Meat									
Daily	902.7(19.8)	557.3(11.6)	<0.001	497.5(21.2)	317.0(12.8)	0.002	405.1(18.3)	240.3(10.3)	0.007
≥3 times/week	2772.6(60.8)	3187.9(66.1)	<0.001	1409.3(60.1)	1679.5(67.7)	<0.001	1363.3(61.5)	1508.4(67.7)	<0.001
1-2 times/week	842.3(18.5)	1034.0(21.4)	0.046	413.9(17.6)	462.8(18.7)	0.719	428.4(19.3)	571.2(24.4)	0.062
<1 time/week	19.3(0.4)	34.2(0.7)	-	6.8(0.3)	17.8(0.7)	-	12.5(0.6)	16.5(0.7)	-
Never/hardly ever	23.4(0.5)	9.1(0.2)	-	17.6(0.3)	2.4(0.1)	-	5.8(0.3)	6.8(0.3)	-
Eggs									
Daily	90.9(1.9)	16.2(0.3)	-	48.5(2.1)	9.1(0.4)	-	42.4(1.9)	7.1(0.3)	-
≥3 times/week	1331.5(29.2)	1182.0(24.5)	0.008	725.4(30.9)	641.0(25.9)	0.041	606.2(27.4)	540.2(23.1)	0.099
1-2 times/week	2834.6(62.6)	3263.7(67.7)	<0.001	1419.9(60.5)	1646.8(66.4)	<0.001	1414.7(63.9)	1616.9(69.0)	0.003
<1 time/week	231.3(5.1)	279.2(5.8)	0.789	231.3(5.0)	131.5(5.3)	0.951	113.7(5.1)	147.8(6.3)	0.780
Never/hardly ever	72.3(1.6)	80.6(1.7)	-	34.8(1.5)	49.3(2.0)	-	37.5(1.7)	31.3(1.3)	-
Fish									
Daily	91.9(2.01)	75.3(1.6)	0.865	50.2(2.1)	33.3(1.3)	-	41.6(1.9)	42.0(1.8)	-
≥3 times/week	1614.8(35.4)	1806.9(37.5)	0.201	834.5(35.6)	963.4(38.8)	0.158	780.3(35.3)	843.5(36.0)	0.772
1-2 times/week	2275.4(49.9)	2449.6(50.8)	0.533	1148.3(48.9)	1237.7(49.9)	0.621	1127.1(50.9)	1211.8(51.7)	0.712
<1 time/week	375.0(8.2)	375.4(7.8)	0.787	202.9(8.7)	180.5(7.3)	0.546	172.1(7.8)	195.0(8.3)	0.818
Never/hardly ever	201.9(4.4)	116.4(2.4)	0.586	110.2(4.7)	65.6(2.6)	0.662	91.7(4.2)	50.8(2.2)	0.794
Dairy products									
Daily	4384.1(96.2)	4455.5(92.4)	<0.001	2262.2(96.5)	2321.1(93.6)	<0.001	2122.0(95.8)	2134.4(91.1)	<0.001
≥3 times/week	92.8(2.0)	200.5(4.2)	0.652	42.5(1.8)	90.3(3.6)	0.804	50.3(2.3)	110.2(4.7)	0.736
1-2 times/week	43.5(0.7)	93.6(1.9)	-	18.8(0.8)	38.1(1.5)	-	24.7(1.1)	55.4(2.4)	-
<1 time/week	14.4(0.3)	29.3(0.6)	-	7.6(0.3)	16.1(0.7)	-	6.8(0.3)	13.1(0.6)	-
Never/hardly ever	24.3(0.5)	44.8(0.9)	-	12.7(0.5)	14.8(0.6)	-	11.6(0.5)	30.0(1.3)	-
Pasta, rice, potatoes									
Daily	1160.3(25.5)	990.8(20.6)	0.007	609.2(25.9)	546.2(22.1)	<0.001	551.1(24.9)	444.6(19.0)	0.024
≥3 times/week	2421.3(53.1)	2663.4(55.3)	0.116	1256.7(53.6)	1367.3(55.2)	0.804	1164.6(52.6)	1296.1(55.3)	0.175
1-2 times/week	929.2(20.4)	1127.5(23.4)	0.105	446.6(19.0)	549.0(22.2)	-	482.6(21.8)	578.5(24.7)	0.257
<1 time/week	39.4(0.9)	31.9(0.7)	-	27.5(1.2)	12.4(0.5)	-	11.9(0.5)	19.5(0.8)	-
Never/hardly ever	8.8(0.2)	7.0(0.1)	-	6.1(0.3)	2.5(0.1)	-	2.7(0.1)	4.5(0.2)	-
Bread, cereals									
Daily	4251.6(93.3)	4279.0(88.7)	<0.001	2189.9(93.3)	2223.8(89.7)	<0.001	2061.7(93.2)	2055.3(87.7)	<0.001
≥3 times/week	161.6(3.5)	350.6(6.9)	0.367	85.9(3.7)	162.7(6.6)	0.570	75.7(3.4)	168.2(7.2)	0.363
1-2 times/week	76.4(1.7)	143.9(3.0)	<0.001	37.9(1.6)	61.7(2.5)	0.084	38.5(1.7)	82.2(3.5)	0.009
<1 time/week	31.2(0.7)	43.7(0.9)	0.490	14.2(0.6)	21.4(0.9)	0.298	17.0(0.8)	22.3(1.0)	0.602
Never/hardly ever	37.4(0.7)	26.3(0.6)	0.424	18.3(0.8)	11.1(0.5)	0.948	19.1(0.9)	15.2(0.7)	0.544
Vegetables and salad									
Daily	1320.4(28.9)	1173.1(36.8)	<0.001	666.3(28.4)	890.8(35.9)	<0.001	654.1(29.5)	882.3(37.7)	<0.001
≥3 times/week	1412.2(30.9)	1564.3(32.4)	0.367	728.3(31.1)	788.2(31.8)	0.734	683.9(30.9)	776.1(33.1)	0.363
1-2 times/week	1259.3(27.6)	1017.2(21.1)	<0.001	649.5(27.7)	531.9(21.4)	0.013	609.8(27.5)	485.4(20.7)	0.009
<1 time/week	323.8(7.1)	279.6(5.8)	0.490	164.4(7.0)	150.4(6.1)	0.797	159.4(7.2)	129.2(5.5)	0.602
Never/hardly ever	244.9(5.4)	189.3(3.9)	0424	136.7(5.8)	119.1(4.8)	0.768	108.1(4.9)	70.2(3.0)	0.544
Fruit									
Daily	2799.1(61.3)	2910.1(60.3)	0.439	1443.6(61.5)	894.5(60.3)	0.570	1355.5(61.1)	1413.7(60.3)	0.662
≥3 times/week	851.4(18.6)	1057.6(21.9)	0.076	409.4(17.4)	549.4(21.9)	0.084	442.1(19.9)	514.3(21.9)	0.432
1-2 times/week	540.9(11.8)	508.5(10.5)	0.466	296.3(12.6)	400.6(10.0)	0.298	244.5(11.0)	260.2(11.1)	0.974
<1 time/week	141.3(3.1)	148.1(3.1)	0.941	76.2(3.3)	159.3(3.4)	0.946	65.1(2.9)	64.7(2.8)	0.622
Never/hardly ever	234.9(5.1)	200.8(4.2)	0.576	121.8(5.2)	254.5(4.4)	0.784	113.2(5.1)	91.8(3.9)	0.979
Pulses									
Daily	142.8(3.1)	46.0(1.0)	-	84.3(3.6)	20.2(0.8)	-	58.5(2.65)	25.8(1.1)	-
≥3 times/week	1157.8(25.4)	1070.1(22.2)	0.079	610.2(26.0)	580.7(23.4)	0.295	547.6(24.8)	489.4(20.9)	0.126
1-2 times/week	2695.1(59.2)	3179.0(65.1)	<0.001	1369.8(58.5)	1585.3(63.9)	0.002	1325.3(59.1)	1553.4(66.3)	<0.001
<1 time/week	391.9(8.6)	416.0(8.6)	0.886	194.6(8.3)	208.0(8.4)	0.978	197.3(8.9)	208.8(8.9)	0.999
Never/hardly ever	165.7(3.6)	151.7(3.1)	0.874	84.3(3.6)	85.9(3.5)	0.688	81.5(3.7)	65.3(2.8)	0.801
Soft drinks									
Daily	811.1(17.8)	533.2(11.1)	<0.001	431.5(18.4)	282.9(11.4)	0.011	379.7(17.1)	250.3(10.7)	0.027
≥3 times/week	531.1(11.7)	473.7(9.8)	0.319	283.7(12.1)	279.9(11.3)	0.841	247.8(11.2)	193.8(8.3)	0.290
1-2 times/week	1033.1(22.7)	1013.3(21.0)	0.373	489.1(20.9)	537.9(21.7)	0.716	471.6(21.4)	475.4(20.3)	0.640
<1 time/week	819.7(18.0)	879.3(18.2)	0.891	431.3(18.4)	424.9(17.1)	0.670	388.4(17.6)	454.4(19.4)	0.489
Never/hardly ever	1356.1(29.8)	1920.5(39.9)	<0.001	634.3(11.3)	953.3(38.5)	<0.001	721.8(32.7)	967.3(41.3)	<0.001
Sweetmeats									
Daily	2131.7(46.8)	2214.5(45.9)	0.553	1133.6(48.4)	1153.2(46.5)	0.368	998.1(45.1)	1061.3(45.3)	0.911
≥3 times/week	895.8(19.7)	1021.2(21.2)	0.419	417.4(17.8)	509.0(20.5)	0.301	478.4(21.6)	512.1(21.9)	0.900
1-2 times/week	847.9(18.6)	802.1(16.6)	0.270	429.8(18.4)	388.0(15.7)	0.307	418.2(18.9)	414.1(17.7)	0.636
<1 time/week	424.3(9.3)	432.4(9.0)	0.931	226.8(9.7)	237.9(9.6)	0.991	197.5(8.9)	194.5(8.3)	0.754
Never/hardly ever	256.9(5.6)	351.0(7.3)	0.341	134.2(5.5)	189.9(7.7)	0.340	122.7(5.5)	161.2(6.9)	0.708

n: calculated in thousands of people units

Table 4: Time spent on using communication technologies on weekdays and at weekends according to gender in 5- to 15-year-olds

Variables	2006 Total (*n*=4282) n(%)	2013 Total (*n*=3601) n(%)	*P*	2006 Males (*n*=2210) n(%)	2013 Males (*n*=1900.0) n(%)	*P*	2006 Females (*n*=2072) n(%)	2013 Females (*n*=1701) n(%)	*P*
WATCHING TV									
Weekdays									
Nothing	-	250.0(6.9)	-	-	112.0(5.9)	-	-	138.0(8.1)	-
≤1 hour	1082.9(25.3)	823.0(22.9)	0.210	588.5(26.6)	416.0(21.9)	0.091	494.5(23.9)	407.0(23.9)	0.984
1 hour	902.5(21.1)	-	-	454.9(20.6)	-	-	447.6(21.6)	-	-
≥1 hour	2179.0(50.8)	2523.0(70.1)	<0.001	1100.2(49.8)	1369.0(72.1)	<0.001	1078.6(52.0)	1154.0(67.8)	<0.001
Weekends									
Nothing	-	160.0(4.4)	-	-	66.0(3.5)	-	-	94.0(5.5)	-
≤1 hour	729.6(17.0)	462.0(12.8)	0.048	389.9(17.6)	244.0(12.8)	0.107	339.7(16.4)	218.0(12.8)	0.236
1 hour	386.7(9.0)	-	-	194.9(8.8)	-	-	191.9(9.3)	-	-
≥1 hour	2995.3(58.9)	2965.0(82.3)	<0.001	1537.4(61.9)	1581.0(83.2)	<0.001	1457.0(55.7)	1384.0(81.4)	<0.001
COMPUTER AND CONSOLE									
Weekdays									
Nothing	-	1466.0(40.7)	-	-	731.0(38.5)	-	-	735.0(43.2)	-
≤1 hour	1527.3(56.6)	1015.0(28.2)	<0.001	877.0(53.7)	511.0(26.9)	<0.001	650.2(61.0)	504.0(29.6)	<0.001
1 hour	536.2(19.9)	-	-	326.9(20.0)	-	-	131.0(12.3)	-	-
≥1 hour	548.5(20.3)	1110.0(30.8)	<0.001	363.8(22.3)	649.0(34.2)	<0.001	488.7(45.5)	461.0(27.1)	<0.001
Weekends									
Nothing	-	859.0(23.9)	-	-	339.0(17.8)	-	-	520.0(30.6)	-
≤1 hour	867.3(32.1)	764.0(21.1)	<0.001	432.3(26.5)	379.0(19.9)	0.026	435.0(40.8)	385.0(22.6)	<0.001
1 hour	426.3(15.8)	-	-	256.6(15.7)	-	-	169.7(15.9)	-	-
≥1 hour	797.4(29.5)	1964.0(54.5)	<0.001	545.7(33.4)	385.0(20.3)	<0.001	302.2(28.3)	793.0(46.6)	<0.001

n: calculated in thousands of people units

The ENSE study has allowed us to evaluate a representative sample of Spanish 5- to 15-year-olds during two periods with a homogeneous criterion, which is maintained systematically over time. One of the effects generated in this young population is increased body weight. In developing countries, as in Europe, Spain is at the top of child obesity data, exceeded only by Malta, Greece and Italy (24). The obesity prevalence in Spain is 12.6%, with a 26.0% rate of being overweight, according to the WHO (4), which correlate with their parents' socio-economic level and level of education (25). The assessment made of our data led us to note a slight improvement in BMI, which has led to an increased prevalence of normo-weight individuals. However, the overall percentage of being overweight was still 24.3%.

Another of the effects produced was a change in the food intake trend. In the last few years, less bread, pulses, potatoes, pasta and rice are eaten; that is, diets rich in complex carbohydrates, the basis of Spanish diet, are not on the increase (26). Our data confirm this trend as the intake of such foods has lowered. More meat (pork and chicken), fish, milk and cheese are being eaten, which spells a diet rich in proteins and, consequently, one rich in saturated fats (26). In the ENSE evaluation, the daily intake of such foods has significantly lowered in recent years. Although eating vegetables on a daily basis increased by 7.9%, it is still insufficient. A drop of 6.7% in drinking soft drinks was also found. This result is favourable as there is evidence that relates frequent soft drink consumption with increased indicators of adiposity and, therefore, with a higher prevalence of obesity (27). Likewise, one of the factors that have changed the most is breakfast. In the ENSE evaluation, we can see better quality when selecting food items for breakfast, which is composed mainly of liquid (milk, juice) and solid (cereals, bread, biscuits) food. Breakfast is the first meal of the day and is directly related with intellectual performance. A bad quality breakfast will make cognitive performance and learning difficult (28), and will not contribute to fulfilling daily dietary recommendations of calories and nutrients, especially micronutrients (29).

Finally, the most outstanding result obtained from the present study is that the Spanish infant-juvenile study population has increasingly acquired

lifestyles that are more sedentary. The cause of this increase might be progressive urbanisation, new technologies and passive entertainment, among others (30). In the last 40 years, many epidemiological studies have demonstrated that physical inactivity has negative effects for health (30). The ENSE evaluation shows us a significant increase in the time spent by the Spanish infant-juvenile study population using communication technologies on weekdays and at weekends. The time spent watching TV not only means less time for physical activity, but also favours greater calorie intake of foods rich in fats and sugars (31). In Italy, 29.0% watch TV between 2-2.5 hours/day, 25.0% do so for 3-3.5 hour/day and 23.0% spend 4 hours/day (32). In Spain, the time our study population spends watching TV every day is 2-3 hours/day on average, especially in families with a low level of education (33).

In short, today's lifestyle is followed by the Spanish infant-juvenile population. This implies a social pattern that continues to undergo constant change. In the subjects' diet, animal-based proteins rich in saturated fats predominate, while the choice of fish as the main protein intake remains low. Eating foods of plant origin, such as pulses, vegetables or fruit, has increased slightly, but remains insufficient. Notwithstanding, drinking soft drinks have significantly lowered in recent years, while intake of sweetmeats remains constantly high. The time spent on physical activities is being gradually substituted for sedentary activities owing to an increasing use of the technology that the study population is surrounded by. Such changes affect anthropometry while these individuals grow and develop. Thus, we observe that prevalence of being overweight is high and must be taken into account for their future health status.

Conclusion

The results obtained herein when comparing both periods reveal that lifestyle, eating habits and physical activity are strongly associated with the infant-juvenile 5- to 15-year-old study population's anthropometry, which acts on the prevalence of them being overweight and obese. Nowa-

days, this age group is abandoning traditional Spanish eating patterns, such as the typical eating habits in the Mediterranean region, and substituting them for more animal-based, highly processed and industrialised foods. They also use more communication technologies at home, which encourage a sedentary lifestyle and can have a negative effect on their future quality of life.

Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc) have been completely observed by the authors.

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