



**Sedentary behavior among Spanish
children and adolescents:
findings from the ANIBES Study**

With the participation of:



NUMBER 13

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Introduction

Sedentary lifestyle is of increasing concern for decades worldwide. Whereas in adults it has been identified as a risk factor for chronic diseases, results in children and adolescents are more controversial.

If regular physical activity is generally recommended for improvement of health and to facilitate weight control, among young people, physical activity also fosters optimal physical and cognitive growth and development. In fact, according to the World Health Organization (WHO) recommendations, children and adolescents aged 5 to 17 years should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity daily.

According to the data included in other report from the ANIBES Study, 55.4 % of Spanish children and adolescents aged 9 to 17 years are not meeting the WHO global recommendations on physical activity.

With the aim of reducing screen time among children and adolescents, the American Academy of Pediatrics (AAP) in 2001 had already recommended that young people should not spend more than 2 hours per day on screen viewing.

In some European countries, 61.0 % of children aged between 11 and 15 years watched TV more than 2 hours per day, as suggested by the data from the HELENA study (Healthy Lifestyle in Europe by Nutrition in Adolescence). Moreover, 58.0 % of the male population in that age group and 53.0 % of the female population of the same age watched TV more than 2 hours per day during weekend days. The publication of these data raised the awareness that adolescents living in Europe are probably not meeting recommendations regarding time spent in front of a screen, especially during weekends. Moreover, the absence of a TV in the adolescents' bedrooms has been identified as a protective factor.

Regardless of the possible negative consequences for health that sedentary behavior could have in early life, it seems they continue during the rest of the life stages.

This research within the ANIBES Study analyzes the prevalence of sedentary behaviors among a representative sample of Spanish children and adolescents, which hypothesizes that in our country, as happens in the rest of the countries around, there is a high degree of children and adolescents who have a high use of screen devices.

In particular, the objectives of this study were focused on describing sedentary behaviors by sex and age (children and adolescents) and electronic device availability at home (TV, computer, console, etc.). Furthermore, the study examines the determinants for excess (≥ 2 h/day) screen time in total and by individual device.



Materials and Methods

The design, protocol and methodology of the ANIBES Study have been already described in detail in Ruiz E. et al, 2015 and Varela-Moreiras G. et al, 2015.

Patterns of sedentary behavior were assessed according to the criteria of the HELENA sedentary behavior questionnaire.

Both children (9-12 years) and adolescents (13-17 years) participating in the study reported the time spent TV viewing, playing with console games, surfing the internet due to study reasons and for non-study reasons, during week and weekend days. Data concerning the number of TVs, computers and consoles at home, and the presence or not of these technologies in the bedroom were collected.

The proportion of children and adolescents who spent less than 2 hours, between 2 and 4 hours and more than 4 hours per day on each customized sedentary activity (TV viewing, computer games, console games and surfing the internet) was calculated separately for week days (from Monday to Friday) and weekend days (Saturday and Sunday) and stratified according to sex and age groups.

Screen time

Except for using the internet for study reasons, for all other sedentary behaviors assessed in this research, the data suggest that Spanish children and adolescents reported more screen time on weekend days than on weekdays.

In this way, 48.4 % of the total participants (children and adolescents aged 9 to 17 years) spent more than 2 hours per day in front of a screen every day of the week, 49.3 % exceeded this time during the week and 84.0 % during weekends.

Overall, the group of adolescents spent more time in TV viewing, playing computer and console games or using the internet (both for study reasons and non-study reasons) than the group of children. The only difference by sex was observed for time spent playing console and computer games, which was higher in males on weekends.

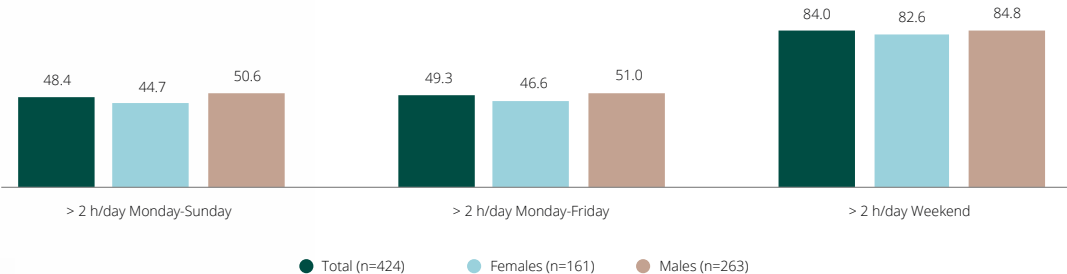
Regardless of sex, almost 38.5 % of the group of children and 60.2 % of the group of adolescents spent more than 2 hours per day in front of a screen during weekdays, and 82.2 % and 85.8 %, respectively, during weekend days.

The data from this study showed that more than 33.0 % had a TV, computer and/or console in their bedrooms. In addition, a total of 44.0 % of the youngest male population reported having 3 or more TVs at home.

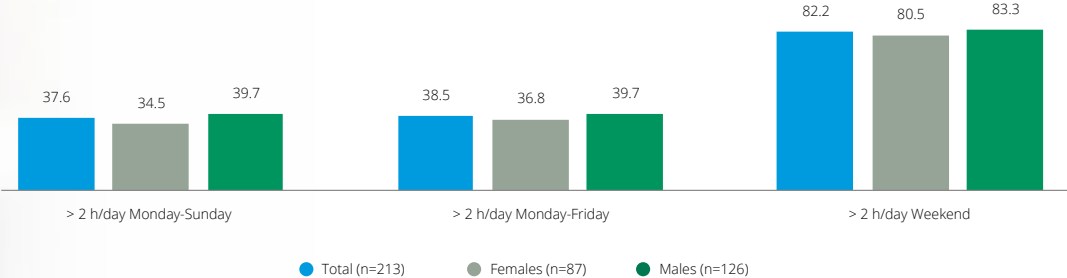
Therefore, the console was the dominant device used by the male population aged 9 to 17 years, whereas TV was the most used by the female population. Remarkably, only 12.1 % of males and 26.9 % of females didn't have any consoles at home.



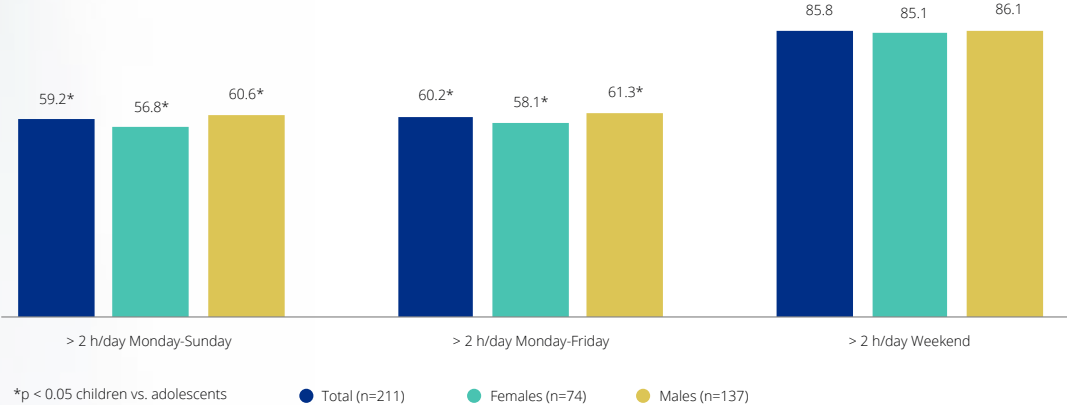
Total of children and adolescents (9 to 17 years) who spend more than 2 h/day in sedentary behaviors (%)



Group of children aged 9 to 12 years who spend more than 2 h/day in sedentary behaviors (%)



Group of adolescents aged 13 to 17 years who spend more than 2 h/day in sedentary behaviors (%)



Differences according to the device used

TV viewing

The use of TV was higher on weekend days than on weekdays regardless of sex and age group. To this should be added that 57.7 % of the group of children and 59.8 % of the group of adolescents watched TV for more than 2 hours on weekend days.

Regarding weekdays, the percentage of people that watched TV for more than 2 h/day was higher in the group of adolescents (25.1 %) than in the group of children (16.9 %), but no significant differences were observed between sexes in any of the age groups.

Electronic computer and console games

At weekends, the use of computer and console games was higher than on weekdays. The group of adolescents spent more time playing computer games than the group of children, during both week and weekend days. Furthermore, the group of male adolescents had more access to computer and console games during weekends.

Internet use for non-study reasons

At weekends, the use of internet for non-study reasons was higher than on weekdays, as a higher percentage of both the group of children and adolescents surfed the internet for more than 2 hours per day. The figure of adolescents who used internet for non-study reasons was also higher than in the group of children both on weekdays and weekends.



Internet for academic reasons

The use of internet for academic reasons was significantly lower in the group of children than in the group of adolescents during weekends, but no significant differences were observed between sexes.

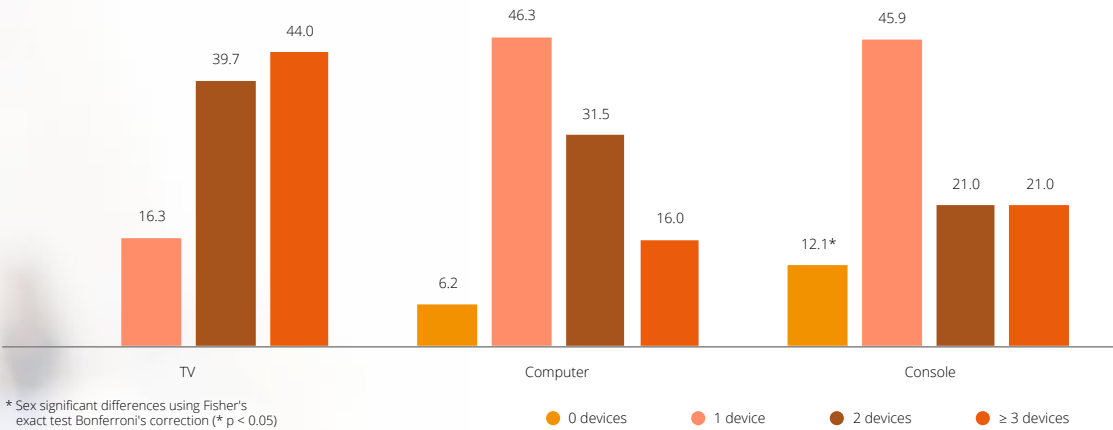
Study without internet use

The time spent studying for less than 2 hours without internet use was higher at weekends than on weekdays. 25.8 % of the group of children and 36.1 % of the group of adolescents sit for more than 2 hours for study reasons without internet use from Monday to Friday, whereas the figures on weekends were 21.1 % and 22.3 %, respectively.

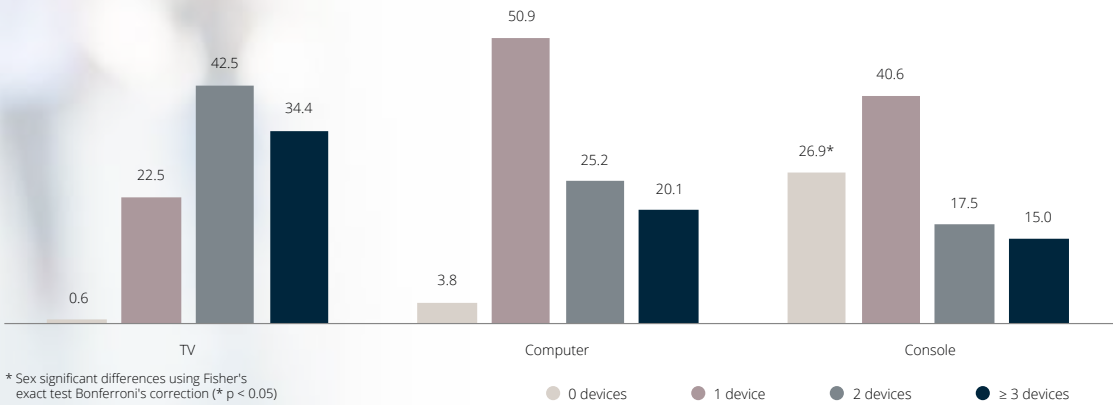
Electronic device availability at home and in the bedroom

Almost all the participating sample in this work had TV at home, 90.0 % had at least one computer, and 61.0 % had consoles. The male population had more TVs and consoles in general at home, especially in their rooms, than the female population.

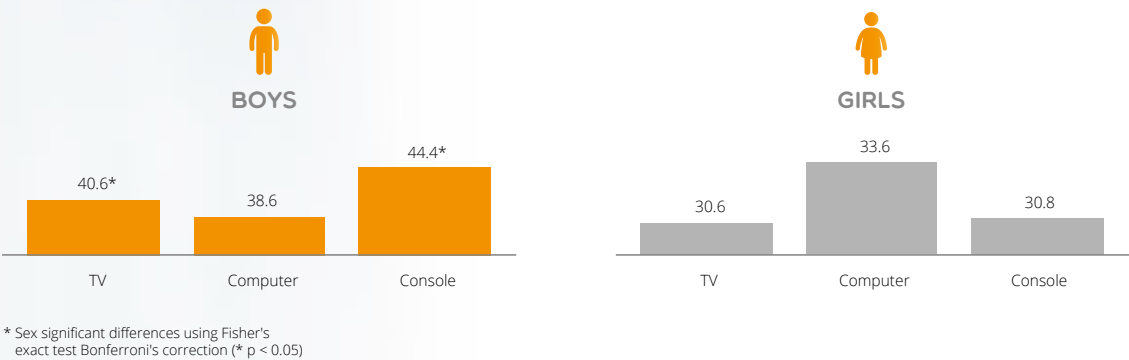
Male population (children boys and adolescent boys aged 9 to 17 years) having TV, computer and console at home (%)



Female population (children girls and adolescent girls aged 9 to 17 years) having TV, computer and console at home (%)



Children and adolescents (boys and girls aged 9 to 17 years) having TV, computer and console in their bedroom (%)



Odds ratio of sedentary behavior (>2 h/day)

Overall, boys (both from the group of children and adolescents) were more likely to play console or computer games more than 2 hours per day on weekends. Compared to the group of children, adolescents were the age group that was generally more likely to watch TV more than 2 hours per day on weekdays, to play computer games on weekdays and to surf on the internet for more than 2 hours per day on weekdays and weekends and to use internet for study reasons more than 2 hours per day on weekend days. Likewise, to have a console in the bedroom was associated with playing with it more than 2 hours per day during the weekend.

Time spent in sedentary behaviors by age group (%)

| | Children (9-12 years) | | | Adolescents (13-17 years) | | | p (age groups differences) |
|---|--------------------------|-------------|-----------|------------------------------|-------------|-----------|----------------------------|
| | < 2 h/day | 2 - 4 h/day | > 4 h/day | < 2 h/day | 2 - 4 h/day | > 4 h/day | |
| TV viewing | | | | | | | |
| Monday-Friday | 83.1 | 16.4 | 0.5 | 74.9 | 20.7 | 4.4 | 0.048 |
| Weekend* | 41.8 | 48.8 | 8.9 | 40.2 | 46.1 | 13.7 | 0.307 |
| Computer Games | | | | | | | |
| Monday-Friday | 98.6 | 1.4 | 0.0 | 91.0 | 8.0 | 1.0 | 0.005 |
| Weekend* | 86.3 | 11.9 | 1.9 | 76.1 | 19.9 | 4.0 | 0.040 |
| Console Games | | | | | | | |
| Monday-Friday | 98.1 | 1.4 | 0.5 | 94.9 | 4.6 | 0.5 | 0.173 |
| Weekend* | 86.6 | 11.0 | 2.4 | 82.1 | 13.8 | 4.1 | 0.413 |
| Internet (for non-study reasons) | | | | | | | |
| Monday-Friday | 94.8 | 4.3 | 1.0 | 81.0 | 14.5 | 4.5 | 0.001 |
| Weekend* | 89.2 | 8.0 | 2.4 | 64.2 | 25.4 | 10.5 | <0.001 |
| Internet (for study reasons) | | | | | | | |
| Monday-Friday | 96.7 | 1.9 | 0.9 | 94.6 | 4.5 | 1.0 | 0.325 |
| Weekend | 96.1 | 1.0 | 0.0 | 91.0 | 8.0 | 1.0 | 0.001 |
| Studying (without internet) | | | | | | | |
| Monday-Friday | 74.2 | 12.2 | 13.6 | 63.9 | 19.8 | 16.3 | 0.053 |
| Weekend* | 78.9 | 20.2 | 0.9 | 77.7 | 18.3 | 4.0 | 0.127 |

Sex, age and weekdays (monday-friday) - weekend differences using Fisher's exact test Bonferroni's correction
 * p < 0.001 weekdays (monday-friday) vs. weekend



Time spent in sedentary behaviors by sex (%)

| | Male population (9-17 years) | | | Female population (9-17 years) | | | p (age groups differences) |
|---|---------------------------------|-----------|-----------|-----------------------------------|-----------|-----------|-------------------------------|
| | < 2 h/day | 2-4 h/day | > 4 h/day | < 2 h/day | 2-4 h/day | > 4 h/day | |
| TV viewing | | | | | | | |
| Monday-Friday | 80.1 | 17.8 | 2.2 | 76.3 | 19.9 | 3.8 | 0.428 |
| Weekend* | 42.4 | 47.2 | 10.4 | 40.5 | 45.8 | 13.7 | 0.458 |
| Computer Games | | | | | | | |
| Monday-Friday | 93.4 | 6.1 | 0.4 | 89.8 | 9.4 | 0.8 | 0.345 |
| Weekend* | 74.9 | 21.1 | 4.0 | 68.9 | 26.4 | 4.7 | 0.350 |
| Console Games | | | | | | | |
| Monday-Friday | 95.0 | 4.6 | 0.4 | 93.6 | 6.5 | 0.0 | 0.400 |
| Weekend* | 78.1 | 17.5 | 4.5 | 75.8 | 19.4 | 4.8 | 0.838 |
| Internet (for non-study reasons) | | | | | | | |
| Monday-Friday | 89.1 | 7.9 | 3.0 | 84.4 | 10.9 | 4.7 | 0.380 |
| Weekend* | 77.2 | 16.5 | 6.3 | 68.2 | 22.5 | 9.3 | 0.088 |
| Internet (for study reasons) | | | | | | | |
| Monday-Friday | 96.3 | 3.2 | 0.4 | 95.4 | 3.9 | 0.8 | 0.713 |
| Weekend | 96.1 | 3.4 | 0.4 | 93.8 | 5.5 | 0.8 | 0.512 |
| Studying (without internet) | | | | | | | |
| Monday-Friday | 70.6 | 14.1 | 15.3 | 67.4 | 17.1 | 15.5 | 0.655 |
| Weekend* | 78.7 | 20.0 | 1.3 | 77.5 | 20.2 | 2.3 | 0.752 |

Sex, age and weekdays (monday-friday) - weekend differences using Fisher's exact test Bonferroni's correction

* p < 0.001 weekdays (monday-friday) vs. weekend

Time spent by children (9 to 12 years)
in sedentary behaviors (%)

| | Children boys (9-12 years) | | | Children girls (9-12 years) | | | p (age groups differences) |
|---|-------------------------------|-----------|-----------|--------------------------------|-----------|-----------|-------------------------------|
| | < 2 h/day | 2 -4h/day | > 4 h/day | < 2 h/day | 2 -4h/day | > 4 h/day | |
| TV viewing | | | | | | | |
| Monday-Friday | 84.9 | 15.1 | 0.0 | 80.5 | 18.4 | 1.1 | 0.383 |
| Weekend* | 45.2 | 49.2 | 5.6 | 37.2 | 48.8 | 14.0 | 0.090 |
| Computer Games | | | | | | | |
| Monday-Friday | 97.6 | 2.4 | 0.0 | 100.0 | 0.0 | 0.0 | 0.152 |
| Weekend* | 82.5 | 14.3 | 3.2 | 91.8 | 8.2 | 0.0 | 0.092 |
| Console Games | | | | | | | |
| Monday-Friday | 96.8 | 2.4 | 0.8 | 100.0 | 0.0 | 0.0 | 0.261 |
| Weekend* | 81.0 | 15.1 | 4.0 | 95.2 | 4.8 | 0.0 | 0.035 |
| Internet (for non-study reasons) | | | | | | | |
| Monday-Friday | 95.2 | 4.0 | 0.8 | 94.1 | 4.7 | 1.2 | 0.928 |
| Weekend* | 88.9 | 8.7 | 2.4 | 90.7 | 7.0 | 2.3 | 0.162 |
| Internet (for study reasons) | | | | | | | |
| Monday-Friday | 97.6 | 2.4 | 0.0 | 96.5 | 1.2 | 2.3 | 0.188 |
| Weekend | 99.2 | 0.8 | 0.0 | 98.8 | 1.2 | 0.0 | 0.778 |
| Studying (without internet) | | | | | | | |
| Monday-Friday | 74.6 | 10.3 | 15.1 | 73.6 | 14.9 | 11.5 | 0.498 |
| Weekend* | 80.2 | 19.8 | 0.0 | 77.0 | 20.7 | 2.3 | 0.225 |

Sex, age and weekdays (monday-friday) - weekend differences using Fisher’s exact test Bonferroni’s correction
 * p < 0.001 weekdays (monday-friday) vs. weekend



Time spent by adolescents (13 to 17 years)
in sedentary behaviors (%)

| | Boys (13-17 years) | | | Girls (13-17 years) | | | p (age groups differences) |
|---|-----------------------|-------------|-----------|------------------------|-------------|-----------|-------------------------------|
| | < 2 h/day | 2 - 4 h/day | > 4 h/day | < 2 h/day | 2 - 4 h/day | > 4 h/day | |
| TV viewing | | | | | | | |
| Monday-Friday | 76.3 | 19.8 | 3.8 | 72.2 | 22.2 | 5.6 | 0.760 |
| Weekend* | 40.5 | 45.8 | 13.7 | 39.7 | 46.6 | 13.7 | 0.994 |
| Computer Games | | | | | | | |
| Monday-Friday | 89.8 | 9.4 | 0.8 | 93.1 | 5.6 | 1.4 | 0.588 |
| Weekend* | 69.0 | 26.4 | 4.7 | 88.9 | 8.3 | 2.8 | 0.005 |
| Console Games | | | | | | | |
| Monday-Friday | 93.5 | 6.5 | 0.0 | 97.2 | 1.4 | 1.4 | 0.270 |
| Weekend* | 75.8 | 19.4 | 4.8 | 93.1 | 4.2 | 2.8 | 0.004 |
| Internet (for non-study reasons) | | | | | | | |
| Monday-Friday | 84.4 | 10.9 | 4.7 | 75.0 | 20.8 | 4.2 | 0.162 |
| Weekend* | 68.2 | 22.5 | 9.3 | 56.9 | 30.6 | 12.5 | 0.279 |
| Internet (for study reasons) | | | | | | | |
| Monday-Friday | 95.3 | 3.9 | 0.8 | 93.2 | 5.5 | 1.4 | 0.795 |
| Weekend | 93.8 | 5.5 | 0.8 | 86.3 | 12.3 | 1.4 | 0.203 |
| Studying (without internet) | | | | | | | |
| Monday-Friday | 67.4 | 17.1 | 15.5 | 57.5 | 24.7 | 17.8 | 0.328 |
| Weekend* | 77.5 | 20.2 | 2.3 | 78.1 | 15.1 | 6.8 | 0.216 |

Sex, age and weekdays (monday-friday) - weekend differences using Fisher's exact test Bonferroni's correction
* p < 0.001 weekdays (monday-friday) vs. weekend

Degree of compliance with recommendations

A high percentage (48.4 %) of the group of children and the group of adolescents in Spain are not meeting recommendations regarding sedentary behavior, especially (and also paradoxically) during weekends (84.0 %). Age appears as an important determinant of a sedentary lifestyle, as the group of adolescents spent more time on screen time than children.

Considering these results and the importance of reducing sedentary activities and behaviors, increased efforts to reduce time spent by children and adolescents sitting for non-study reasons are needed.

The findings also suggest that the weekend may be a critical target for interventions aiming at reducing screen time because TV viewing and computer use are particularly high on these days. In this sense, it would be necessary to promote activities in different settings (family, school or community) as alternatives to these long periods that children and adolescents spend sitting during spare time.

Lastly, and given that there has been a decreasing trend in Spain of active commuting to school, moderate- to vigorous-intensity physical activity and active commuting (mainly walking) to school should be encouraged, among other activities.

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The final protocol of the ANIBES scientific study was previously approved by the Clinical Research Ethics Committee of the Autonomous Region of Madrid (Spain).



