

# PASOS 2019 STUDY

Main results of the PASOS 2019  
study on physical activity,  
lifestyle and obesity of the  
Spanish population aged 8 to 16  
Gasol Foundation / Nov 2019

Physical Activity, Sedentarism and Obesity of Spanish youth



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**ZERO**  
CHILDHOOD  
OBESITY



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**Report PASOS 2019 study**

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# ADVANCING CHILDREN'S HEALTH

In 2013, responding to the scale of the childhood obesity problem worldwide, my brother and I created the Gasol Foundation with the aim of fighting against this pandemic. For the first time, obesity is more prevalent than hunger according to the United Nations Food and Agriculture Organization. This phenomenon affects 124 million boys and girls between the ages of 5 and 19 worldwide and. Specifically, our country, Spain, is at the top of the list of European countries with the highest rate of childhood obesity.

Based on this, and given the lack of recent representative data from Spain on the health status of children and teenagers, we decided to launch the PASOS study, which assesses the level of physical activity, sedentarism, lifestyle and the obesity of minors. We wanted to ascertain the situation so that we could act on it effectively. To this end, and after more than a year of intense work, we are pleased and proud to present this report with the final results of the study.

We want to take this opportunity to thank all the institutions, entities and people who have made this possible. Among them, we especially thank all the institutions that have supported us: the High Commissioner for the Fight against Child Poverty; the Ministry of Health, Consumer Affairs and Social Welfare, and the Spanish Agency for Food Safety and Nutrition (AESAN); the Ministry of Education and Vocational Training; the National Sports Council; the regional government ministries of Education and/or Health in Spain's 17 autonomous regions; and the General Council of Physical and Sports Education (COLEF). We also express our gratitude to the Probitas Foundation, as our main partner; the Barça Foundation, Banco Santander, IFA Group and Viena, as health allies; and Objetivo Bienestar Junior, our media partner.

We also sincerely thank the Hospital del Mar Institute for Medical Research (IMIM), which has supported us in the scientific coordination of the study; the 13 research groups and the 68 researchers who have participated in the field work; the 245 schools; the more than 3,800 participating families; and, of course, all the boys and girls from whom we continue to learn so many things every day.

Thanks to all the people who have made the PASOS study possible and who will contribute to a healthier future for young people.

**Pau Gasol**

**President and co-founder of the Gasol Foundation**



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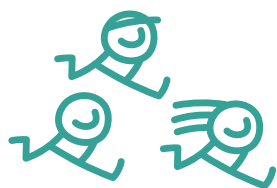
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# INTRODUCTION

**Childhood obesity is a worldwide epidemic that can greatly affect physical, psychological and social health and the current and future development of society.**

# 1 MAIN DATA AND CONCLUSIONS OF THE PASOS 2019 STUDY

## GENERAL

- The **PASOS 2019 study represents major scientific progress in Spain**, since it updates the knowledge on the childhood obesity epidemic and its determining factors for a representative sample of children aged 8 to 16.
- PASOS 2019 has created a **robust consortium of research groups in Spain** that, together with the network of private support, institutions, schools, families and participating children and adolescents, can contribute to **generating more scientific evidence** in this field in the coming years.
- In the coming months and years, many scientific articles will be published analysing and discussing in depth the data presented in this report.

### RECOMMENDATION

It is advisable to continue investing in research on childhood obesity in Spain, since there is a considerable lack of information on this epidemic, its determining factors, and the interventions aimed at preventing and treating it.

## OVERWEIGHT AND OBESITY

- The **childhood obesity epidemic in Spain** is confirmed and it is significantly affecting the development of children and teenagers. According to the body mass index (BMI), 14.2% of the young population suffers from this problem, and 24.5% have abdominal obesity.
- **The prevalence of childhood obesity has increased in the past two decades:** 1.6% according to BMI, and 8.3% according to abdominal obesity.

### RECOMMENDATION

Systematic measurement of waist circumference is recommended to calculate the waist-height ratio as a complementary indicator of BMI for estimating obesity in childhood and adolescence.



## POVERTY AND OBESITY

- The prevalence of childhood obesity increases with poverty.

### RECOMMENDATION

Public health policies and interventions focused on the prevention and treatment of childhood obesity should incorporate a sensitive, clear-eyed view of social inequalities. Additionally, policies and interventions to reduce child poverty should focus on promoting health.

## PHYSICAL ACTIVITY

- Only 36.7% of children and teenagers meet the World Health Organization (WHO) recommendation of at least 60 minutes of daily moderate or vigorous physical activity.
- Non-compliance with the recommendation of physical activity is **higher in girls** (70.1%) than in boys (56.1%) and is also **higher in teenagers** (69.9%) compared to children (56.1%).
- The average decrease in minutes dedicated to daily physical activity is **very important** throughout the last stages of childhood and adolescence. Participants in 4th year of ESO perform 98.2 less minutes of physical activity per day (one-and-a-half hours a day) than those in 3rd year of primary school.
- A total of 74.9% of the young population considers their general physical fitness to be good or very good. However, 21.2% of minors consider that their flexibility is bad or very bad; this was the aspect of physical fitness with the poorest values in self-assessment.
- Children and teenagers differ in how they perceive their general physical fitness. The percentage of adolescents (60.2%) in 4th of ESO who consider that their physical fitness is good or very good is much lower than that of children in 3rd year of primary school (86.6%), with a difference of 26.4%. **Girls contribute much more** (difference of 35.8%) **to this difference** than boys (difference of 16.2%).

### RECOMMENDATION

Everyday physical activity should be promoted both during school time and after-school leisure time. For this, it is necessary to motivate and actively involve all those in the community who can play a relevant role in this regard: families, teachers (in particular, physical education teachers), and sports and leisure centre personnel, among others.

## USE OF SCREENS

- **Spanish children and teenagers spend a much longer time using screens than what the WHO recommends** as the daily maximum amount (120 minutes per day). Specifically, on weekdays, they spend more than 178 minutes per day (almost 3 hours) and on weekends, more than 282 minutes per day (more than 4.5 hours).
- **More than half of Spanish children and teenagers do not follow the recommended screen time use on weekdays and almost 80% do not follow it on weekends.** The level of non-compliance is higher among boys than girls and is also much higher in adolescence than in childhood.
- **With increased age, there is a greater use of screens** in each of the academic years studied in PASOS 2019 (from 3rd year of primary school to 4th ESO), both on weekdays and weekends and for both sexes.

### RECOMMENDATION

In 5th year of primary school, the daily minutes dedicated to screen use on weekdays exceed those dedicated to physical activity; in the subsequent academic years, the difference in time dedication to these activities is increasingly higher. For this reason, prevention policies and interventions should focus on avoiding sedentarism and the use of screens before 10 years of age, while reinforcing initiatives that promote health during adolescence.

## HOURS OF SLEEP

- **The average number of hours that teenagers sleep per day on weekdays (7.78h) in 4th ESO is below the minimum limit recommended** by the National Sleep Foundation (8 to 10 hours in teenagers).
- In the study population, 40.9% do not follow the recommendations for hours of sleep on weekdays, and the percentage of non-compliance rises up to 48.1% on weekends. Specifically, **almost 30% of children and more than 50% of teenagers do not follow the recommendations.**

### RECOMMENDATION

This reality is significantly threatening the opportunities for physical, cognitive, psychological and social development of children and teenagers. The aspects associated with the deterioration of sleep habits should be studied more in depth in order to design effective interventions that highlight the importance of following the recommendations.

## EATING HABITS

- **Adherence to the Mediterranean diet has decreased in the last two decades.** Currently, only 40% of the young population has a high level of adherence, down from 44.7% in 2000. Additionally, the percentage of children and teenagers with a low level of adherence (10.3%) is higher than it was in 2000 (3.8%).
- The percentage of teenagers (35.9%) with a high level of adherence to the Mediterranean diet is lower than that of children (45.7%), but it is excessively low in both populations.
- **Too many children and adolescents have eating habits that undermine diet quality,** such as eating commercial baked goods for breakfast (31.7%), eating in a fast-food restaurant at least once a week (23.1%) or consuming sweets several times per day (22%).
- **Currently, habits that ensure a high level of adherence to the Mediterranean diet, including consumption of fruits and vegetables, are in severe decline.** Only 15.9% of the young population state they consume at least 4 servings of fruit and/or vegetables per day.

### RECOMMENDATION

Eating habits are increasingly deteriorating among children and teenagers, and forceful measures should be taken to promote the consumption of healthy foods and achieve a high adherence to the Mediterranean diet, since this determines a major part of development during childhood and adolescence. Additionally, access to food products that are detrimental to diet quality should be limited.

## QUALITY OF LIFE

- **More than 20% of children and teenagers report feeling worried, sad or unhappy.** The percentage is higher among girls (25%) than boys (16.6%) and is also higher in adolescence (25.7%) than in the childhood (15.1%).
- **The score given to the self-perceived health status of the participants in the PASOS 2019 study is lower at an older age. Specifically, the difference between 3rd year of primary school and 4th ESO for girls is 12 points and 5.2 points, for boys** (scale from 0 to 100 in which 100 is an optimal health status).

### RECOMMENDATION

Quality of life indicators of Spanish children and teenagers are worrying, considering the young age (from 8 to 16 years) of the study population. It is important to ensure the rights of children throughout their development to adulthood, since aspects related to emotional well-being, which are currently impaired, may be causes or consequences of health and social problems, such as childhood obesity.



# CHILDHOOD OBESITY, A GLOBAL EPIDEMIC

## CHILDHOOD OBESITY WORLDWIDE

**Childhood obesity has become one of the biggest social and health problems of the 21st century. In 2016, there were more than 340 million children and teenagers worldwide who were overweight or obese<sup>1</sup> (figure 1).**

The WHO considers childhood obesity a global epidemic and one of the most worrying risk factors for human health in future generations. In fact, it is one of the most prevalent health problems worldwide among children and teenagers, since 124 million are affected by obesity, and another 216 million are overweight (figure 1).

The worldwide trend in recent decades is not very encouraging, since in the population aged 5 to 19:

\_From 1975 to 2016, obesity rates multiplied by 10<sup>1</sup>.

\_From 2000 to 2016, excess weight increased from 1 in 10 (10.3%) to almost 1 in 5 (18.4%)<sup>2</sup>.

\_From 2010 to 2016, the figures of excess weight increased in all WHO-defined world regions. The highest increase took place in the regions with a greater number of developing countries: African (North and South), South-East Asia, and Western Pacific regions (figure 1).

**If this trend continues, in 2022, the global population of children and teenagers with childhood obesity will exceed those who are underweight<sup>1</sup>.**

If this trend continues, the number of overweight infants and children under 5 will increase to 70 million in 2025.

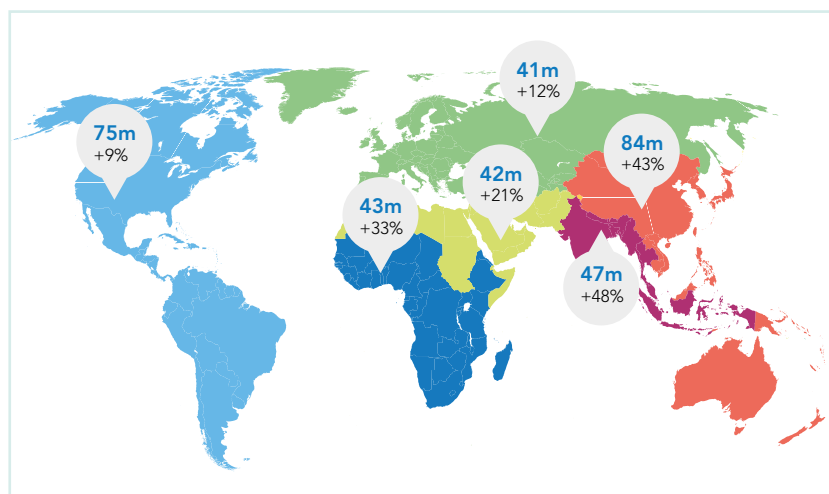
The WHO, at the 65th World Health Assembly<sup>3</sup>, adopted objectives regarding this epidemic, and countries are working to achieve them by 2025. These include “no increase in the proportion of overweight minors” and “adoption of policies to reduce the impact on children of foods with a high content of saturated fats or sugars”.

It is evident that the epidemic of childhood obesity is dynamic and that we should also focus on low- and middle-income countries<sup>4</sup> where underweight and excess weight usually coexist as serious epidemiological problems in childhood, both associated with malnutrition<sup>5</sup>.

Estimates with the population under 5 years of age are not much more encouraging, since UNICEF, WHO and the World Bank<sup>6</sup> show that, in the world, approximately 1 in 3 children aged 0 to 5 is not developing properly. The most recent estimates for this age range indicate there are 149 million children who are short for their age, 49 million who are underweight, and 42 million who are overweight or obese, of whom 31 million live in developing countries<sup>7</sup>.

Figure 2 shows the prevalence of excess weight, worldwide and by country, for the population under 5. This map highlights the need for surveys in countries for which there is no data.

The WHO has alerted for decades about the importance of addressing the problem of childhood overweight and obesity worldwide, and this has contributed to many national or regional institutions conducting surveys of the prevalence of overweight in children. Despite the limitations associated with the age range studied, the methodology used and the period of time in which each study was carried out, it is interesting to observe the worldwide comparative maps that include the total children population. Figure 3 shows the map developed by the World Obesity Federation, which highlights the 3 countries with the highest prevalence in each of the WHO-defined regions.



**Figure 1** – Total population aged 5 to 19 worldwide that is overweight, and increase in prevalence from 2010 to 2016 for each of the regions defined by the WHO. Image obtained from: NCD-RisC, 2017.

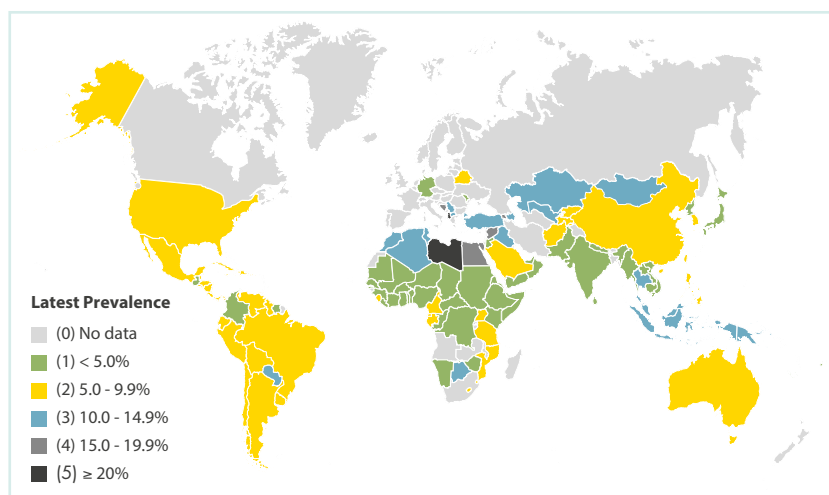
#### You should know:

\_A child is considered **overweight** when they are among the 15% of children with a higher BMI for their sex and age.

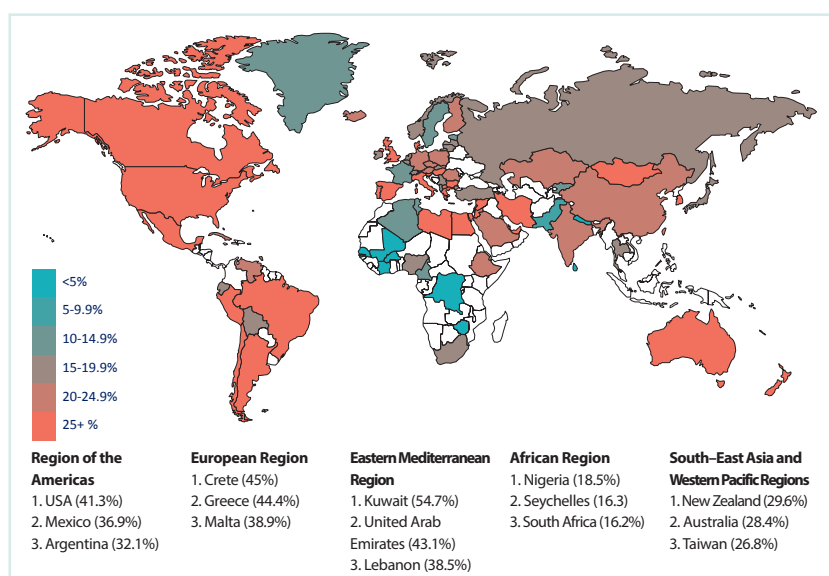
\_They are considered to be **obese** when they are among the 5% with a higher BMI for their sex and age.

\_Overweight and obesity are different degrees of excess body weight.

\_The estimation of the **weight status** of a child is determined using their weight and height to calculate their BMI. Their age and sex are considered to classify them based on standardised growth curves. In Spain, the main curves used by paediatricians are those created by the Faustino Orbegozo Foundation<sup>8</sup>. However, there are other reference curves used worldwide, such as those created by the International Obesity Task Force (IOTF)<sup>9</sup>, the WHO<sup>10,11</sup>, or the Center of Disease Control (CDC) of the USA<sup>12</sup>.



**Figure 2** – Age-standardised estimation of the prevalence of excess weight in children under 5 years of age. Image obtained from: WHO, 2015.



**Figure 3** – Prevalence of excess weight in children worldwide. Image obtained from: World Obesity Federation, 2017.

The prevalence of childhood obesity is alarming in both developed and developing countries, making it a global epidemic or pandemic.

## CHILDHOOD OBESITY IN EUROPE

In Europe, the latest data (2015–2017) from the Childhood Obesity Surveillance Initiative (COSI) led by the WHO indicate that the countries in the Mediterranean arc are those with the greatest prevalence of childhood overweight and obesity, in both boys (figure 4) and girls (figure 5) aged 5 to 10. This may seem paradoxical due to their high accessibility to healthy foods and the culinary tradition that characterises the Mediterranean diet. This report analyses and describes some of the factors, besides diet, that also play a role in this problem of complex aetiology.

Spain has been the focus of the PASOS 2019 study and is among the countries in which the scale of this epidemic is particularly worrying.

The countries of the Mediterranean arc, including Spain, are those with the highest prevalence of excess weight in children in Europe.

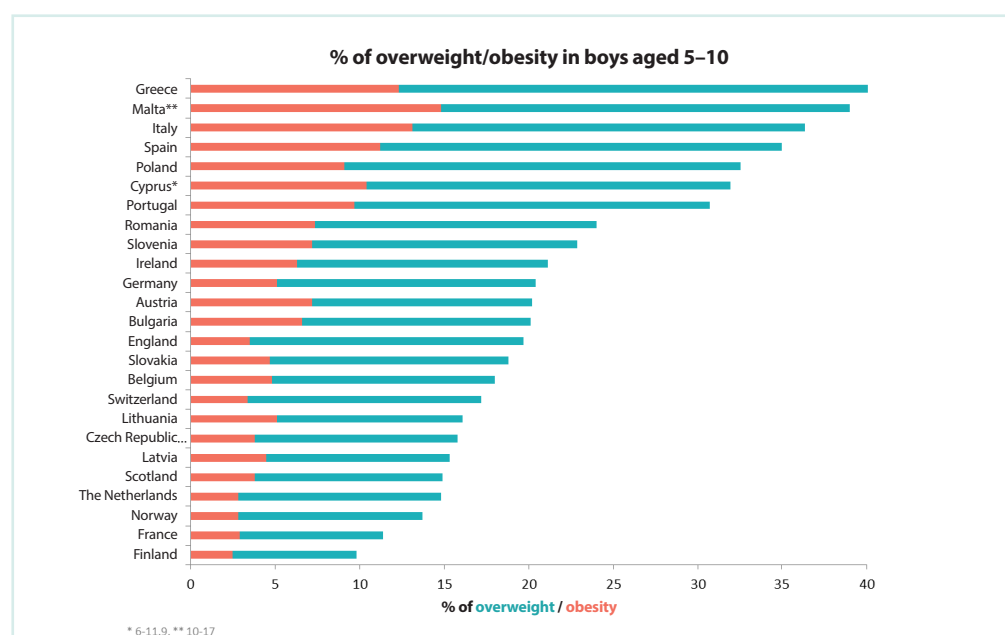


Figure 4 – Prevalence of excess weight in boys in Europe. World Obesity Federation, 2017.

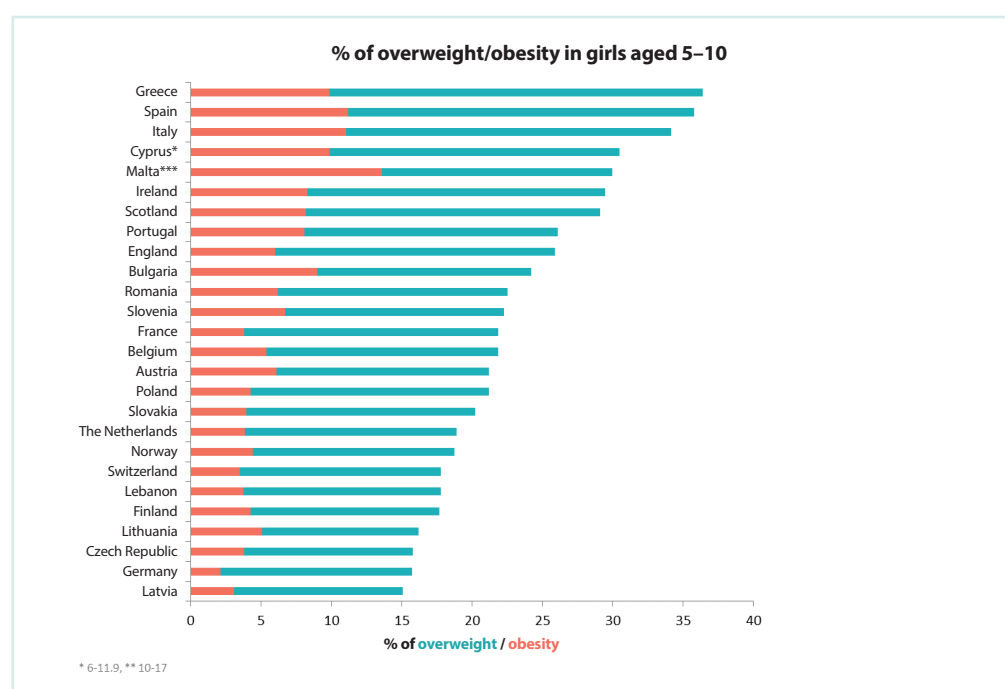


Figure 5 – Prevalence of excess weight in girls in Europe. World Obesity Federation, 2017

Spain ranks 4th in obesity and overweight in boys aged 5 to 10 in Europe, and 2nd in girls of the same age range.



## CHILDHOOD OBESITY IN SPAIN UNTIL 2018

2 out of 5  
Spanish children  
aged 6 to 9 are  
overweight or obese.

In Spain, the representative reference for the prevalence of overweight and obesity in children is the ALADINO 2015<sup>13</sup> study, which reports data to the European COSI. This study, led by the AESAN of the Ministry of Health, Consumer Affairs and Social Welfare, reported the percentage of children aged 6 to 9 who are overweight or obese is 41.3%. Table 1 shows this prevalence distributed by sex.

**Table 1** – Prevalence of overweight and obesity, by sex, in Spanish children. ALADINO 2015 study.

	Overweight (%)	Obesity (%)	Overweight + Obesity (%)
Boys	22.4	20.4	42.8
Girls	23.9	15.8	39.7
<b>TOTAL</b>	<b>23.2</b>	<b>18.1</b>	<b>41.3</b>

According to the ALADINO 2015 study, there seems to be a trend towards stabilization of the overweight rates in children. However, Spain has one of the highest rates in Europe.

The PASOS 2019 study arises from the need to have up-to-date scientific evidence on childhood overweight and its determining factors in Spain, while also including a greater age range of the young population and using objective methods for measuring some key determinants, such as physical activity.



# CONSEQUENCES OF CHILDHOOD OBESITY

**The consequences of childhood obesity can be short<sup>14</sup>, medium<sup>15</sup> or long term<sup>16,17</sup>, have an impact on the individual<sup>18</sup>, and even threaten the collective well-being and development of society<sup>19</sup>.**

It is important to take into account that obesity can have biological/physical, psychological/emotional, and social consequences. Because of this, interventions aimed at preventing obesity should also consider the biopsychosocial perspective (figure 6). Consequently, aspects regarding these 3 areas, which are important for child and human development, are mentioned in the short-, medium-, and long-term consequences that follow.

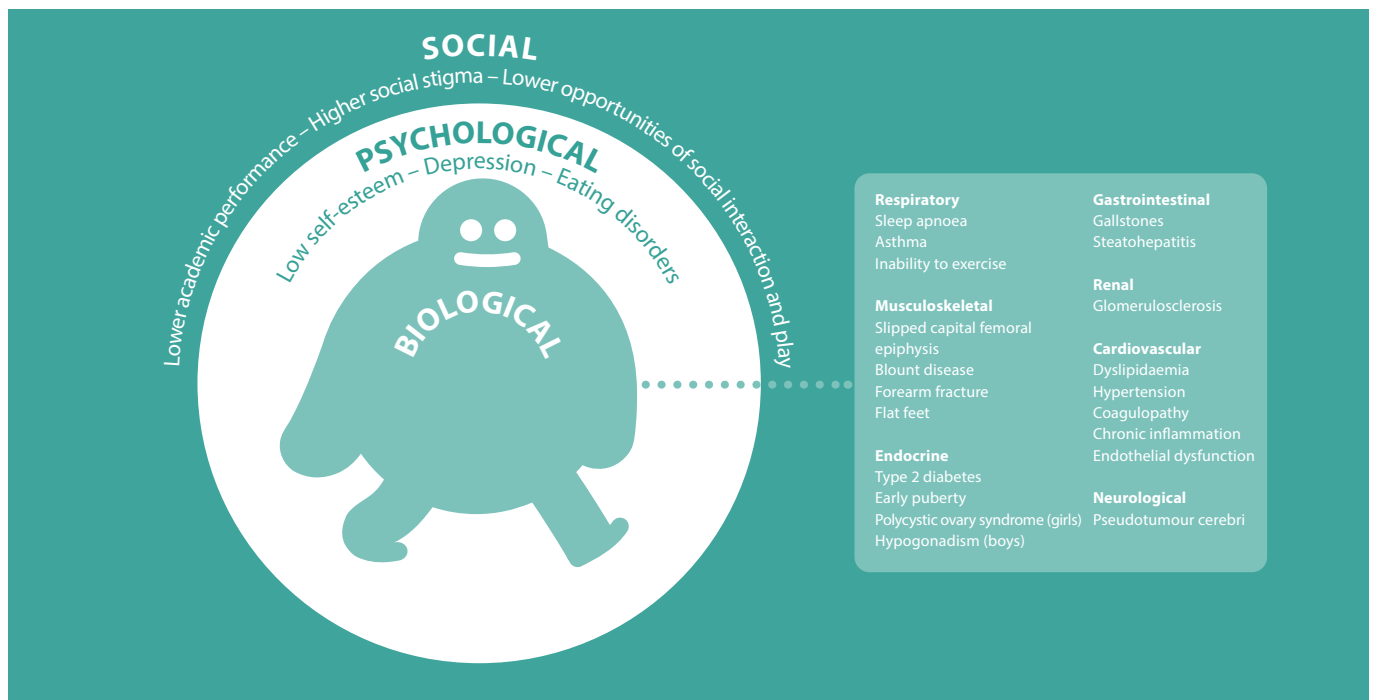
## SHORT-TERM CONSEQUENCES

During childhood, obesity can cause medical complications, as shown in Figure 6 (adapted from Ebbeling C, 2002<sup>20</sup>). One of the principal complications is an **increase in cardiovascular risk factors** associated with increased BMI<sup>21</sup> and waist circumference<sup>22</sup>. The increase in the prevalence of childhood obesity has also led to an **increase in the incidence of type 2 diabetes**, which is increasingly appearing at younger ages<sup>23</sup>. This chronic endocrine disease can lead to multiple complications throughout the life cycle of those who suffer from it. Other short-term medical consequences of childhood obesity are **musculoskeletal, gastrointestinal, respiratory, neurological, or dermatological**.

Moreover, **obesity in early childhood can cause sleep disorders, such as obstructive sleep apnoea**, which affects neurocognitive function<sup>24</sup>; and insomnia, which can contribute to chronic obesity, since failure to sleep the recommended hours is a determining factor<sup>25</sup>.

Additionally, **other complications that also substantially affect the quality of life of obese children are psychological and social**<sup>26</sup>. Scientific evidence shows that obese minors can have a worse image of themselves and express feelings of inferiority and rejection<sup>27</sup>. This affects confidence in relations with peers, which, combined with existing social prejudices, can cause **greater social isolation, more inactivity by not participating in certain games and dynamics, and difficulties making friends**<sup>28</sup>. All of this contributes to obese children **having depressive factors, such as low self-esteem<sup>29</sup> or anxiety<sup>30</sup>**.

Childhood obesity affects the health of minors in the short term, increasing the chances of suffering cardiovascular diseases and diabetes at an early age, as well as sleep disorders and psychological and social complications.



**Figure 6** – Biopsychosocial consequences of obesity in early childhood. Gómez SF, 2015 (adapted from Ebbeling, 2002)

## MEDIUM-TERM CONSEQUENCES

The presence of excess weight at an early age has consequences in the medium term. A cohort study showed that 75% of children with a BMI above the 70th percentile at age 5 will be teenagers with excess weight<sup>31</sup>. Additionally, increasing years with obesity worsen many medical complications and, particularly, psychological and social complications.

In adolescence, the quality of social relationships with peers<sup>32</sup>, academic performance<sup>33</sup> and the environment largely determine psychological well-being<sup>34</sup>. Because of this, and due to the social stigma associated with obesity<sup>35</sup>, the **psychological status**, which may already be weak in obese teenagers, can be substantially worsened.

7 out of 10 children under 5 with excess weight will be overweight or obese in adolescence.

## LONG-TERM CONSEQUENCES

Obesity in childhood and adolescence is associated with an increased risk of obesity in adulthood; in fact, **42% to 63% of obese children become obese adults**<sup>16</sup>. Long-term complications can become serious and are linked to diabetes, cardiovascular disease, certain types of cancer, or psychosocial dysfunction<sup>28</sup>.

Furthermore, epigenetics shows that the **mother's lifestyle and excess weight, even before pregnancy, increase the probability of her children becoming obese throughout childhood**<sup>36</sup>. This problem tends to become chronic not only at an individual level but also throughout subsequent generations.

For years, there have been warnings about the **global consequences at the social or economic level**<sup>37</sup>. The sustainability of health systems<sup>38</sup>, work productivity, collective well-being, or food production are global consequences caused by an increase in the prevalence of obesity<sup>39</sup>.

Family plays a key role in childhood obesity rates: minors whose parents are overweight or obese are more likely to be obese in childhood.



# THE GASOL FOUNDATION APPROACH: #ZEROCHILDHOODOBESITY

## HISTORY AND MISSION

There is not a single person in Spain who has not heard of the Gasol brothers. Pau and Marc Gasol, from Sant Boi (Barcelona), Olympic athletes and NBA All-Star players, have gained Spanish and international attention for years both for their sport career and their social involvement. They have always been committed to children's health and have collaborated for years in various organisations working to favour children. Because of this, and given the seriousness of childhood obesity worldwide, in 2013 they decided to found the Gasol Foundation, a non-profit organisation that aims to reduce childhood obesity rates through initiatives in Spain and the United States of America that combine a holistic approach to promoting a healthy lifestyle.

Pau and Marc Gasol wanted to build a solid foundation for an organization that can make a difference and help reduce this global epidemic. For this reason, from the beginning, there were two people whom they particularly wanted on the Gasol Foundation Board of Trustees: Dr. Valentí Fuster, Director of the Carlos III Spanish National Centre for Cardiovascular Research and President of the Advisory Health Council of the Ministry of Health, Social Services and Equality, among other positions; and Joan Roca, chef at El Celler de Can Roca restaurant, considered one of the best chefs in the world and also Goodwill Ambassador of the United Nations Development Programme.

The Gasol Foundation works to reduce childhood obesity by promoting sport and physical activity, following a healthy diet, appropriate hours and quality of sleep, and the emotional well-being of boys and girls, young people and their families in the United States and Spain.

Under the motto #ZeroChildhoodObesity, the entity defends that, in order to build healthier communities, a coordinated, multisectoral and transversal approach is essential: the involvement, work, and joint commitment of all those involved in the education and development of minors are necessary to prevent childhood obesity.

"Pau and I are strong advocates of the importance of living a healthy and active life. We want boys and girls to understand how much they can enjoy taking care of themselves and learn how healthy habits can play a key role in their development".

Marc Gasol

"Through the motto of the Gasol Foundation *Make It Healthy, Make It Fun*, we introduce children to the metaphor of the Healthy Galaxy, where we discover the four key planets of health and prevention of childhood obesity. The objective is that young people and their families incorporate healthy habits into their everyday lives".

Pau Gasol



Figure 7 – Representation of the Healthy Galaxy of the Gasol Foundation. Gómez SF 2017.

## THE HEALTHY GALAXY: A METAPHOR ABOUT THE DETERMINANTS OF CHILDHOOD OBESITY

At some point in recent human history, healthy habits decided to take off planet Earth into a newly created galaxy called the **Healthy Galaxy**. In it, 4 beautiful planets were formed:

- \_ Healthy diet
- \_ Sport and physical activity
- \_ Hours and quality of sleep
- \_ Emotional well-being

The common mission to all the projects of the Gasol Foundation is to take off towards this Healthy Galaxy to observe, learn, grow and bring healthy habits back to planet Earth so that all children and their families can have a healthy development. With this, children, teenagers, and their families are introduced to a **great pedagogical metaphor that faces them with a motivating challenge** to be achieved during the project.

This holistic approach based on the Healthy Galaxy metaphor comes from the doctoral thesis<sup>40</sup> of Dr Santi F. Gómez, currently responsible for programmes at the Gasol Foundation. This metaphor was used for the first time during his thesis presentation before the evaluating committee, with the aim of summarising the complexity of determining factors in the childhood obesity epidemic.

**The metaphor considers that the 4 planets mentioned are constantly interacting, that they mutually and constantly influence each other.** If one of them is balanced, the other three also tend to be balanced. If one of them becomes unbalanced, the other three also do, thus increasing the probability that a child will become overweight during childhood. For example, if the planet of hours and quality of sleep is unbalanced, the planets of healthy eating, sports and physical activity, and emotional well-being are affected. In this sense, it is clear that if a child that was not following the recommendations of hours of sleep starts to follow them, they will observe that the amount of food (energy) their brain demands will tend to be more balanced and that the rate of food intake will be less anxious. In addition, they will feel more energetic and with the desire to practice sports and physical activity and, consequently, they will feel better about themselves. This will favour an improvement of their relationship with other children, thus increasing the opportunities to play and do physical activity. Finally, this will lead to social inclusion and well-being, and will contribute to continue balancing the signals of hunger and satiety.

The Healthy Galaxy represents a metaphorical space trip to discover the four determinants of childhood obesity: healthy diet, sports and physical activity, hours and quality of sleep, and emotional well-being.

The 4 planets are in constant interrelation and mutually and constantly influence each other. If one of them is positively or negatively affected, the other three are also impacted.

Additionally, the Gasol Foundation highlights for each planet some aspects/areas that constitute important determinants of a child's lifestyle and the probability of developing obesity throughout childhood, proven by scientific evidence. These aspects involve satellites or parts inherent to each of the planets, and considerable time is devoted to in-depth exploration in the Gasol Foundation's "space projects".

Each planet has satellites that represent the key messages of each pillar and that are highlighted in each initiative promoted by the Gasol Foundation to achieve a greater impact in its interventions.

There are 16 aspects that are vitally important for a healthy development:

**Satellites of Healthy eating:**

- Lunch/dinner with all the family.
- Balanced diet.
- Shop and cook with all the family.
- Hydrate. Water consumption.

**Satellites of sports and physical activity:**

- Daily physical activity.
- Physical activity with all the family and with peers during leisure time and, whenever possible, outdoors.
- + 60 minutes/day of moderate or vigorous physical activity.
- Screens: maximum of 2 hours/day and avoid excessive sedentarism.

**Satellites of hours and sleep quality:**

- Between 9 and 11 daily hours of nighttime sleep in children aged 6 to 13.
- Ensure appropriate room conditions: temperature, light and noise.
- Importance of daily family routines and rhythms.
- Turn off screens 30 minutes before going to sleep and make a relaxed transition to sleep.

**Satellites of emotional well-being:**

- Appropriate parenting approaches and family communication.
- Establish limits for education in healthy habits.
- Empathy with each stage of development that the child goes through.
- Importance of establishing a safe emotional bond from early childhood.

The Gasol Foundation's transversal promotion of healthy habits is carried out in each of the entity's initiatives, even if it is particularly focused on one of the pillars.

**As you can see, these 16 satellites will largely determine a person's opportunities for a healthy development throughout their life and, therefore, they should be prioritised during childhood and adolescence to prevent excess weight in childhood.**

The Healthy Galaxy can place any of its planets at the centre of the galaxy and observe the bidirectional associations between them are maintained. In turn, each planet can place any of its satellites in the centre and observe how the balance of one of them contributes to the balance of the rest. For this reason, in all the projects or activities the Gasol Foundation carries out, the 4 planets are mentioned, together with the importance of the balance between them. Even if the activity is a cooking workshop, the content to be highlighted will always be transversal, mentioning the importance of eating a balanced diet to be more active, rest better or feel better about oneself.



## ROLES THAT THE GASOL FOUNDATION PLAYS IN SOCIETY

If we took a cross section of any of the planets of the Healthy Galaxy and looked inside, we could begin to sense the roles that the Gasol Foundation has set out to play in society. In fact, **the Gasol Foundation's strategic plan takes into account societal public health models**, such as the one formulated by Dahlgren and Whitehead in 1991<sup>41</sup>, which states that many of the current public health problems are determined by an immense set of factors located at different levels of influence over a person and their individual health status (see figure 8).



**Figure 8** – Roles the Gasol Foundation plays in society using Dahlgren and Whitehead's rainbow model<sup>41</sup>.

This strategic approach was defined by the entity, following a positioning project carried out by two students from *Harvard Business School*. It considers the Gasol Foundation must **lead the public cause by promoting social awareness campaigns that generate lines of advocacy** that improve the structural determinants of healthy habits promoted by the Gasol Foundation.

For the entity, its **“community laboratories” are the cities of Los Angeles (USA) and Sant Boi de Llobregat (Spain)**, within which it develops the role of implementing programmes. The Gasol Foundation pilot projects are aimed at promoting healthy lifestyles in these communities, which, in turn, facilitate the in-depth evaluation of these initiatives for their improvement after their pilot implementation. **The entity's evaluation protocols consider a mixed methodological approach, and both qualitative and quantitative techniques are always included.** The role of programme implementation allows to reach dozens or, at most, hundreds of beneficiaries, since they are directly implemented by professionals from the Foundation, who ensure all the theoretical and strategic principles that define the organisation are applied and also carefully record key information that will contribute to improving and refining the pilot initiatives.

A Gasol Foundation project is considered ready for a coordinating role when it has already undergone a thorough piloting and validation process. This role is also carried out by professionals from the Foundation that guide and supervise the implementation of each project. **This way, other we train professionals from the key sectors the entity works with and who are in frequent contact with children and their families.** The goal is to create opportunities for implementing projects that promote healthy habits among institutions and professionals who can contribute in a relevant way to preventing childhood obesity. Once these key players are trained and empowered, the professionals at the Gasol Foundation act as guides, coordinating and supervising the project and supporting these players to make the proposed objectives of the project a reality.

The Gasol Foundation aims to play three roles in society: publicly lead the cause to raise awareness and place childhood obesity at the centre of the public and social agenda; coordinate collaborative networks with different entities to drive projects that promote healthy habits; and implement initiatives, designating Sant Boi de Llobregat and Los Angeles as hubs.

## COMMUNITY-BASED INTERVENTION MODEL

The Gasol Foundation is committed to approaching childhood obesity considering the determinants of the epidemic in a holistic way, as detailed in the previous section that described the Healthy Galaxy. It is also committed to developing complex community-based interventions that allow the population as a whole to evolve in unison in a healthy way through the progressive adoption of healthy lifestyles. The main investigations carried out to date on the efficacy of this type of community-based interventions<sup>42,43</sup> point to their enormous potential, although more scientific evidence is needed to conclusively evaluate their favourable effect. They also point out that these must be multilevel and multicomponent strategies in order to achieve the entire set of key factors that determine the epidemic and that are located at different levels of influence over the person's health status, as indicated by the socio-ecological models.

Childhood obesity is multifactorial and multilevel, that is, it requires the implementation of programmes that promote healthy habits in the community and simultaneously act from different areas through various coordinated agents and using a holistic approach to healthy habits: initiatives called multilevel and multi-component community-based interventions.



*The Family Run,  
Barcelona 2018*

## NETWORK OF KEY SOCIAL SECTORS FOR PREVENTING CHILDHOOD OBESITY

The Gasol Foundation has defined the key sectors that contribute considerably to preventing childhood obesity, shown in figure 9. Multilevel and multi-component community-based interventions should place these sectors as the main focus of the initiatives implemented, in order to significantly impact the childhood obesity epidemic.

In this way, the entity believes in the power of key institutions that interact on a daily basis with children and their families. Many of them are located in the local environment and, therefore, involving city councils is also key. Institutions such as social service centres that look after vulnerable families, primary care centres, sports and leisure centres, kindergartens, primary schools, high schools, or markets and shops are ideal sectors for the implementation of projects that promote healthy lifestyles that contribute to preventing childhood obesity.

In addition, the Foundation is committed to the development of projects aimed at each of these key sectors, but also marks as a future goal the simultaneous implementation in the same community of all the successful projects that have been defined and validated. The Gasol Foundation's position is that a child will develop in a healthy way as long they develop in an environment with healthy habits.

To achieve this, minimising the level of exposure of children to the obesogenic environment that characterises our current society is essential. For this reason, we must raise the volume of the entity's social speaker to favour structural changes that determine childhood lifestyles, together with projects that promote healthy habits to prevent childhood obesity.

The Gasol Foundation promotes an intervention model focused on local institutions that influence the habits of families in their daily routine. The goal is to implement initiatives that empower communities to foster healthy environments.



**Figure 9** – Key sectors identified by the Gasol Foundation for the implementation of community-based interventions to prevent childhood obesity.







# PASOS 2019 STUDY

**Representative study of the Spanish population aged 8 to 16. In total, 3,887 children and teenagers from 247 schools of the 17 autonomous regions participated. A network of 13 research groups composed of 68 researchers collected the data in the months of April, May and June 2019.**

## 5 CONTEXT

Childhood is an essential stage for acquiring healthy habits that last in adulthood. PASOS 2019 arose from the need to know more about the situation of overweight in children and the level of physical activity, the degree of sedentary lifestyle and the type of activity practiced by Spanish children and teenagers. Other lifestyle factors that are part of the Healthy Galaxy were studied, as well as their association with structural variables. Research in this field should establish the priority lines of action and promote policies and initiatives based on the actual situation.

The Gasol Foundation shares the recommendations included in the report on the physical activity of children and teenagers in Spain published by the Nutrition Research Foundation in 2016<sup>45</sup>, and updated in 2018<sup>46</sup>. These reports show the results from national surveys and recent scientific publications that use data from Spanish children and teenagers. In addition, specific attention is given to the need for representative data on the prevalence of physical activity of Spanish children and teenagers. The report specifically highlights that:

- 1 Regarding physical activity, there are no data obtained using objective methods in large and representative samples of the Spanish population. It is important to consider the possibility of using objective methods (accelerometers) in a representative sub-sample of the Spanish population.
- 2 The self-reported data from studies published to date have been obtained using different types of questionnaires, with various ways of evaluating physical activity. A consensus should be reached in the methodology used for evaluating physical activity, which serves as a common tool for evaluation of all the studies carried out in Spain, and allows the comparison of data and evaluation of trends. Ideally, this tool should be used in all surveys that evaluate physical activity in the different autonomous regions of Spain.
- 3 Information regarding the determining factors of physical activity (demographic data, physical fitness, motor skills, etc) and the place where it is carried out should be recorded. It is essential to have information on the reasons for the decline in physical activity levels in the transition from childhood to adolescence.
- 4 Information about children's physical activity during recess at school should be recorded. Understanding the behaviour at different ages and among boys and girls would ease the implementation of programmes that promote active breaks.

The Gasol Foundation considered these four points in the design of the PASOS study, whose objectives, methodology and main results are presented in this document.

# 6 GOALS

## MAIN GOAL

Determine the level of physical activity and estimate the prevalence of inactivity in a representative sample of Spanish children and teenagers aged 8 to 16.

## SECONDARY OBJECTIVES

- 1 Calibrate and revalidate the Physical Activity Unit - 7 items Screener questionnaire (PAU-7S)<sup>47</sup>.
- 2 Study the association between lifestyle variables (diet, hours of rest and sleep, physical fitness and quality of life) and the level of physical activity.
- 3 Identify structural and environment factors that may be associated with the level of physical activity.
- 4 Study the association of lifestyle variables and the socioeconomic profile of the parents of the participating children and teenagers.
- 5 Study the association between the weight status of the children participating in the study and the level of physical activity identified.



## STUDY DESIGN

Observational and cross-sectional study of the population.

## SAMPLING

A probabilistic sampling was carried out in 5 stages (multi-stage sampling) using random selection in each of them:

**1st stage:** 120 Spanish municipalities of different size were randomly selected to ascertain the situation of various population groups:

- \_ 40 municipalities with more than 200,000 inhabitants. Given that Spain does not have 40 municipalities of these dimensions, the number of schools in the more populated municipalities such as Madrid, Barcelona, and Seville was doubled (as if the municipality had been included twice). This way, the proportional representation of the most populated areas was ensured.
- \_ 40 municipalities with 30,000 to 200,000 inhabitants.
- \_ 40 municipalities with 3,000 to 30,000 inhabitants.

The proportionality of the municipality sample based on autonomous regions was ensured. For this, the number of residents aged 8 to 16 years in each autonomous region was estimated, using data from the National Statistics Institute (INE).

**2nd stage:** for each of the municipalities, a primary and a secondary school were randomly selected; the random selection included all the schools, both public and private. For each selected school, two alternate schools were chosen at random, in case the first one was not interested in participating.

**3rd stage:** for each of the selected schools, a participating year was chosen randomly: 3rd, 4th, 5th or 6th for primary schools, and 1st, 2nd, 3rd or 4th of ESO, for secondary schools.

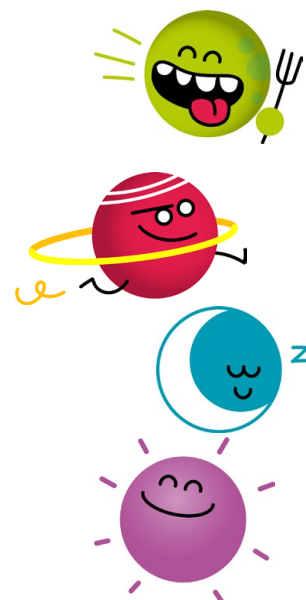
**4th stage:** in the event that the selected course had more than one academic stream, the participating class group was randomly selected.

**5th stage:** all the enrolled students from the selected classes were invited. They were given an envelope with the informed consent form that they would have to return signed by their parents/legal guardians, to reflect whether they agreed or not to participate in the study.

The final sample of participants was 3,887 students enrolled in 247 primary and secondary schools, which were distributed proportionally by autonomous region, as shown in Figure 10.



**Figure 10** – Number of schools participating in the PASOS 2019 study by autonomous region.





# VARIABLES

The variables of the PASOS 2019 study consider the holistic approach of the Gasol Foundation on the key determinants of childhood obesity. Data collection was carried out through three main sources of information:

- 1 **Validated** questionnaires addressed to different groups:
  - \_ Children and teenagers: lifestyle variables.
  - \_ Parents/legal guardians of the participating children and teenagers: lifestyle variables, socioeconomic factors and environment variables.
  - \_ Physical education teachers from the participating schools: environment variables.
- 2 **Accelerometers** used for 9 days for 10% of the participating children and teenagers.
- 3 **Anthropometric measures:** weight, height and waist circumference of the participating children and teenagers.

The following table details the variables considered in the study and the tools used to evaluate them:

**Table 2** – Variables and evaluation tools of the PASOS 2019 study.

VARIABLES	EVALUATION TOOLS		
	CHILDREN AND TEENAGERS	PARENTS / LEGAL GUARDIANS	PHYSICAL EDUCATION TEACHERS
<b>Antropometric: weight, height and waist circumference</b>	SECA 869 weighing scale SECA 217 stadiometer SECA 201 measuring tape	Self-reported weight and height	-
<b>Quality of diet</b>	KIDMED <sup>48</sup> test	Short Diet Quality Screener (SDQS) <sup>49</sup>	-
<b>Diet habits</b>	-	<i>Ad hoc</i> questionnaire developed by the Gasol Foundation	-
<b>Physical activity</b>	PAU-7S <sup>47</sup> and accelerometers (ActiGraph wGT3X-BT)	Questionnaire derived from Girona Heart Registry (REGICOR) <sup>50</sup>	-
<b>Sedentarism</b>	Screen-time Sedentary Behaviour Questionnaire (SSBQ) <sup>51</sup>	REGICOR <sup>50</sup>	-
<b>Physical fitness</b>	International Fitness Scale (IFIS) <sup>52</sup>	-	-
<b>Hours and quality of sleep</b>	Hours: questions from Sleep Habits Survey for Adolescents (SHSA) <sup>53</sup> Quality: BEARS <sup>54</sup>	Questions from SHSA <sup>53</sup>	-
<b>Emotional well-being</b>	Quality of life: EQ-5D-Y-5L <sup>55</sup>	Quality of life: Perceived Stress Scale (PSS) <sup>56</sup>	-
<b>Socioeconomic</b>	-	Education level and occupation	-
<b>Environment</b>	-	<i>Ad hoc</i> questionnaire developed by the Gasol Foundation	<i>Ad hoc</i> questionnaire developed by the Gasol Foundation and the General Council of Physical and Sports Education (COLEF)
<b>Other</b>	Weight at birth, breastfeeding, and chronic diseases	Alcohol and tobacco use	-

## DATA COLLECTION AND SOURCES OF INFORMATION

The scientific coordination of the study has been led by the Gasol Foundation, which has had the support of the Cardiovascular Risk and Nutrition Group of the IMIM. In total, 13 research groups throughout Spain were in charge of data collection in each of the 17 participating autonomous regions. The Gasol Foundation led the data collection in the schools of the regions of Catalonia, the Valencian Community and Aragon, and the rest of the groups assumed data collection in a greater or lesser number of schools depending on their geographical location and staff. Each group had a principal investigator (responsible for achieving the agreed objectives) and an investigator responsible for coordinating data collection (regional coordinator).

On February 12, 2019, a meeting was organised at the headquarters of the Gasol Foundation in Sant Boi de Llobregat with the participation of all research groups. At the meeting, a consensus was reached with the principal investigators on general aspects of the study and its implementation, and the regional coordinators standardised and practiced the data collection methods.

Then, the Gasol Foundation enrolled all the participating schools. The management team of the schools and the physical education teachers were the main players in this. Once enrolled, the regional coordinators of each research group contacted the schools to schedule an in-person meeting in which the necessary documentation was delivered and the procedures for data collection were explained in detail.

Each participant, with the approved informed consent completed and signed by their parents/legal guardians, was identified with a unique and confidential numerical code. This code is the one used for anthropometric variable data collection and the one used in the online and paper questionnaires (parents/legal guardians and children and teenagers, and only parents/legal guardians, respectively). The same code was used for the parents/legal guardians and their children. Data are identifiable by name or surname.

Accelerometers were used in 10% of the sample, selected randomly, ensuring a proportional distribution among autonomous regions. Each research centre delivered the devices to the participating students who wore the accelerometer on their wrist for 9 days. These students received information from the regional coordinators. After 9 days, the participants completed the online questionnaire on lifestyle variables together with their classmates.

The use of an accelerometer allowed the achievement of one of the specific objectives of the PASOS 2019 study: calibration and revalidation of the PAU-7S physical activity questionnaire in a representative Spanish sample.

## ETHICAL ASPECTS

The protocol of the PASOS 2019 study was validated by the Medical Research Ethics Committee of the Fundació Sant Joan de Déu in Barcelona, a partner of the Gasol Foundation. Some of the research groups had to validate the study protocol with ethics committees in each of the autonomous regions.

Each school was offered the possibility of holding an informative meeting with the regional coordinator addressed to the parents to present the study and address their questions. Two copies of the informed consent form were given to each of the families invited to take part in the study. The contact details for the main investigator of the study (Dr Santi F. Gómez) were included in the informed consent, so that parents could resolve any questions before, during or after data collection.

The regional coordinators, who were in charge of data collection, followed the ethical principles specified in the Declaration of Helsinki. This was one of the objectives of the study session held on February 12, 2019. When taking anthropometric measurements and recording the response to the questionnaires on lifestyle, and environment factors, the privacy of all participants was guaranteed and they were allowed to abandon the study at any point, after which all the data generated to date would be destroyed (databases and paper files). The participating children and teenagers were allowed to decline their participation in anthropometric measurements, even though their parents/legal guardians had approved and signed the informed consent form. In this sense, the choices made by the children and teenagers were respected, and intimidation was avoided by managing the situation with the person responsible at the school at all times. The study followed current regulations on the protection of personal data.

# 8 PASOS 2019 RESEARCH CONSORTIUM



The PASOS 2019 study was integrated by 13 research centres, all of them leaders in Spain in their fields, such as epidemiology and public health, physical activity and health, physical education or sports medicine. These groups held periodic follow-up meetings (every 1 or 2 weeks) with the **Gasol Foundation's scientific coordination team**, to which they had access at all times via telephone or email.

- Nutrition, exercise and healthy lifestyle research group. Polytechnic University of Madrid.
- Optimisation of training, sports performance and physical conditioning research group. Saint Anthony Catholic University of Murcia.
- Nutritional epidemiology, physical activity and obesity prevention group. Malaga University.
- Nutrition research group. University of Las Palmas de Gran Canaria.
- Community nutrition and oxidative stress research group. University of the Balearic Islands.
- Physical activity and quality of life research group. Faculty of Sports Sciences, University of Extremadura.
- Regional unit of sports medicine of the Principality of Asturias. Municipal Sports Foundation of Avilés.
- Education, health and physical activity, gender studies research group. University of A Coruña.
- ELIKOS research group (ELikadura, arIketa fisikoa eta OSasuna, nutrition, physical activity and health). Public University of Navarra.
- Promotion of physical activity for health research group. Toledo Faculty of Sports Sciences, University of Castilla-La Mancha.
- Cardiovascular risk and nutrition research group. IMIM.
- Probitas Foundation.

The Good understanding, motivation and constant willingness to collaborate have been key in achieving the study data collection in a very short period of time (April–June 2019).

## 9 SUPPORT THAT MADE THE STUDY POSSIBLE

The PASOS 2019 study has become a reality thanks to the support of multiple public and private institutions, dozens of professionals in the field of health and education, and the collaboration of the thousands of families of children and teenagers that participated in the study. Their commitment has been essential to obtaining recent objective data on the situation of excess weight and children's health habits in Spain.

Some of the most outstanding institutional support received came from the [High Commissioner for the Fight against Childhood Poverty](#); the [Ministry of Health, Consumption and Social Welfare](#) and [AESAN](#); the [Ministry of Education and Vocational Training](#); the [National Sports Council](#); the regional government ministries of Education and/or Health in Spain's 17 autonomous regions; and [COLEF](#).

The PASOS study has been possible thanks to the commitment to children's health from the following entities: [Fundación Probitas](#), main partner; our health allies [Banco Santander](#), [Viena](#), [Grupo IFA](#), [Fundació Barça](#) and [Fundación Deporte Joven](#); and [Objetivo Bienestar Junior](#), media partner of the initiative. We thank all of them for supporting research in children's health with the Gasol Foundation.





# PASOS 2019 STUDY RESULTS

**The results of the PASOS 2019 study show an alarming reality regarding the epidemic of childhood obesity and its determining factors in Spain. It is important to act urgently in an efficient and coordinated manner.**

# 10 PREVALENCE OF CHILDHOOD OVERWEIGHT AND OBESITY IN SPAIN

The results presented below, corresponding to the PASOS 2019 study, have been estimated using the WHO standardised growth curves that allow a comparison of these results with surveys in other countries and also with previous surveys in Spain, such as the ALADINO study<sup>13</sup> and the EnKid study<sup>57</sup>.

National and international authorities in the area of health and protection of children’s rights are rightly concerned about the growing obesity epidemic. The numbers are alarming and urgent action is needed.

You should know:

There are several indicators used to estimate overweight and obesity in childhood. The classic and most commonly used is the **BMI**, which relates weight and height (kg/m<sup>2</sup>). For the young population (aged 2 to 18), this BMI is placed in the standardised growth charts according to sex and age, showing if the child/teenager is overweight (those in the 15% of the population with a BMI higher for their age and sex) or obese (those in the 5% of the population with a BMI higher for their age and sex). There are several standardised growth charts based on the reference population both in Spain (Orbegozo, Carrascosa) and internationally (IOTF, WHO, CDC).

## EXCESS WEIGHT FOR CHILDREN ACCORDING TO BODY MASS INDEX

As shown in figure 11, the prevalence of excess weight for the young population (aged 8 to 16) in Spain is 34.9%. This is composed by 20.7% of children and teenagers who are overweight and 14.2% who are obese.

Childhood obesity affects a very significant proportion of Spanish society and may condition the development of children and teenagers and of the communities as a whole.

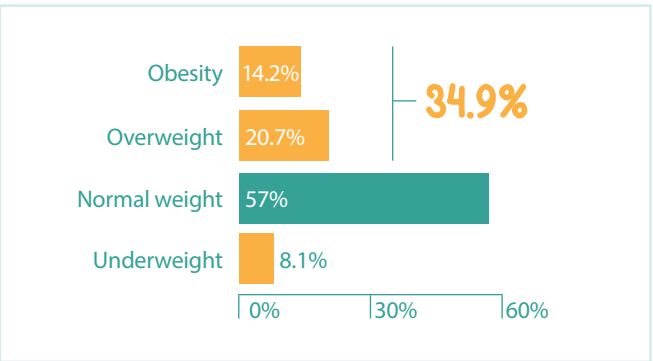


Figure 11 – Prevalence of overweight and obesity using BMI.

## CHILDHOOD OBESITY USING WAIST CIRCUMFERENCE

Figure 12 shows the prevalence of abdominal obesity measured using the ratio of waist circumference to height. We observed that 24.6% of children and teenagers in Spain presented an excessive accumulation of fat in the abdominal area, which is considered abdominal obesity. Compared to the results shown in figure 11, the prevalence of childhood obesity measured using BMI is 10.3% higher than with the waist–height ratio.

The Gasol Foundation recommends systematic measurement of waist circumference as a complementary indicator to BMI for estimating childhood obesity.

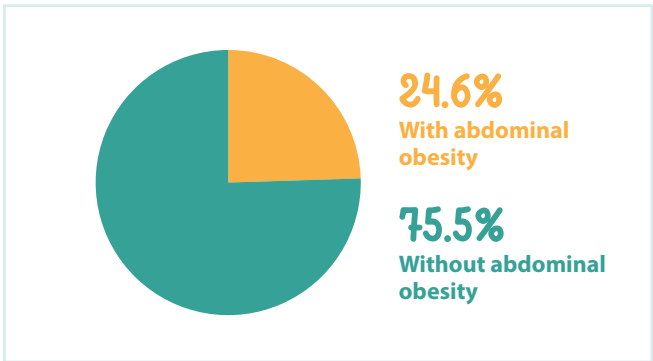


Figure 12 – Prevalence of abdominal obesity using the weight–height ratio

The most serious consequences of childhood obesity appear in the medium or long term, and the high rates reveal the current scale of the epidemic, which makes it urgent to use effective and efficient prevention and treatment strategies.

Measurement of waist circumference and calculation of the waist–height ratio should be systematically incorporated in doctor visits and epidemiological studies as a complementary indicator to BMI for estimating abdominal obesity.

#### You should know:

For years, scientific evidence has warned about the need to measure waist circumference in Spain and the results of the PASOS 2019 study reinforce this. By using only BMI as an estimator of childhood obesity, we may be underdiagnosing the epidemic<sup>58</sup>.

The excessive accumulation of fat in the abdominal perimeter is estimated by calculating the coefficient between the waist circumference and height. If the ratio is greater than or equal to 0.5, the child or teenager is considered to have abdominal obesity and may be exposed to risk factors for their current or future health.

## TRENDS IN CHILDHOOD OBESITY IN THE LAST TWO DECADES

The EnKid study<sup>57</sup>, also representative of the Spanish population, was carried out between 1998 and 2000 by a group of researchers led by Prof. Dr. Lluís Serra-Majem. Enkid studied at a wide age range of the young population (aged 2 to 24) and it is the previous reference to the PASOS study that allows a comparison of the current rates of childhood obesity with those from 19 years ago.

To guarantee an accurate comparison of the rates between both studies, only the population with an exact age range between 8.00 and 16.00 years of age was selected. For this reason, all the participants from the PASOS 2019 study aged slightly below or slightly above that range were excluded from this analysis.

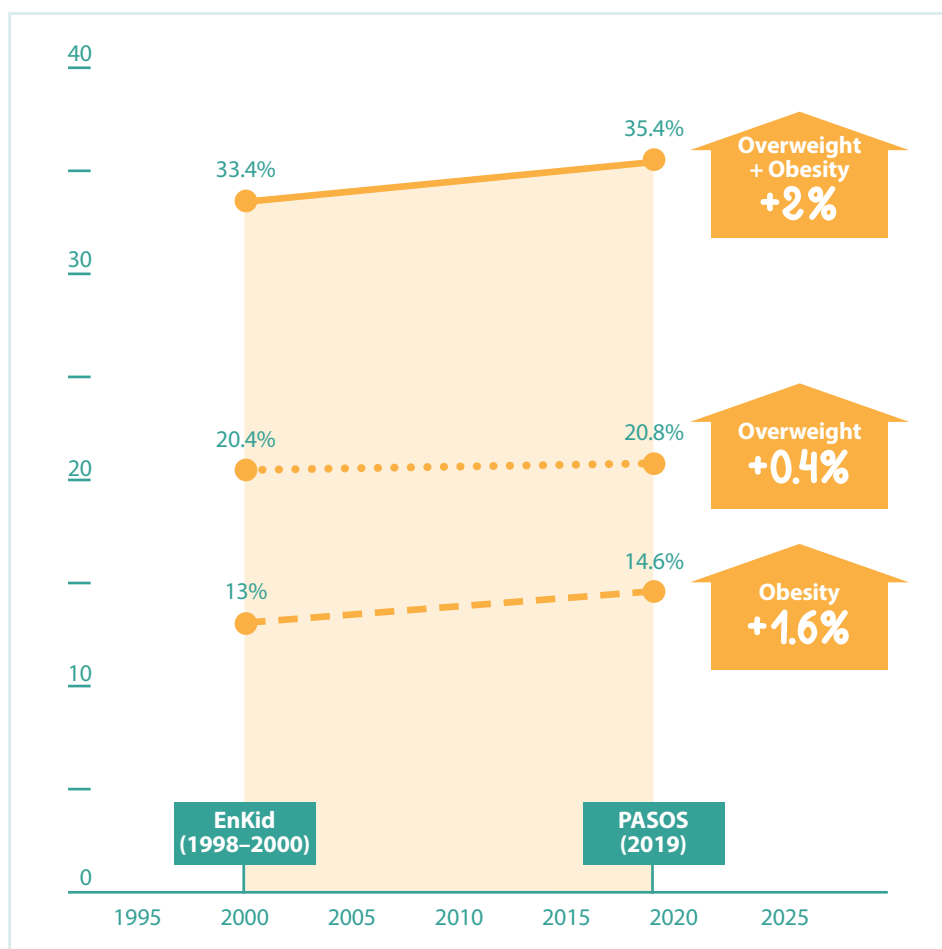


Figure 13 – Trends in the prevalence of childhood overweight and obesity in the last two decades using BMI.

Figure 13 shows that, using BMI, the prevalence of obesity has increased by 1.6% in the population aged 8 to 16, while overweight has increased by 0.4%. This means that, overall, there has been a 2% increase in excess weight in the last two decades.

Enkid also measured waist circumference. Figure 14 shows that abdominal obesity has increased by 8.3% in the last 2 decades, a much greater increase than that observed using BMI (1.6%).

These results reinforce the recommendation for using waist circumference as an indicator of childhood obesity.

The epidemic of excess weight in children in Spain has increased by 2% in the last two decades.

You should know:

Childhood obesity may be increasingly manifesting in the form of excessive accumulation of fat around the waist, which carries multiple health risks and is related to unhealthy habits, such as excessive sedentarism or consumption of sugary drinks, among others.

Abdominal obesity in children and teenagers has increased in the last two decades in a greater proportion (+ 8.3%) than childhood obesity estimated using the BMI (+ 1.6%).

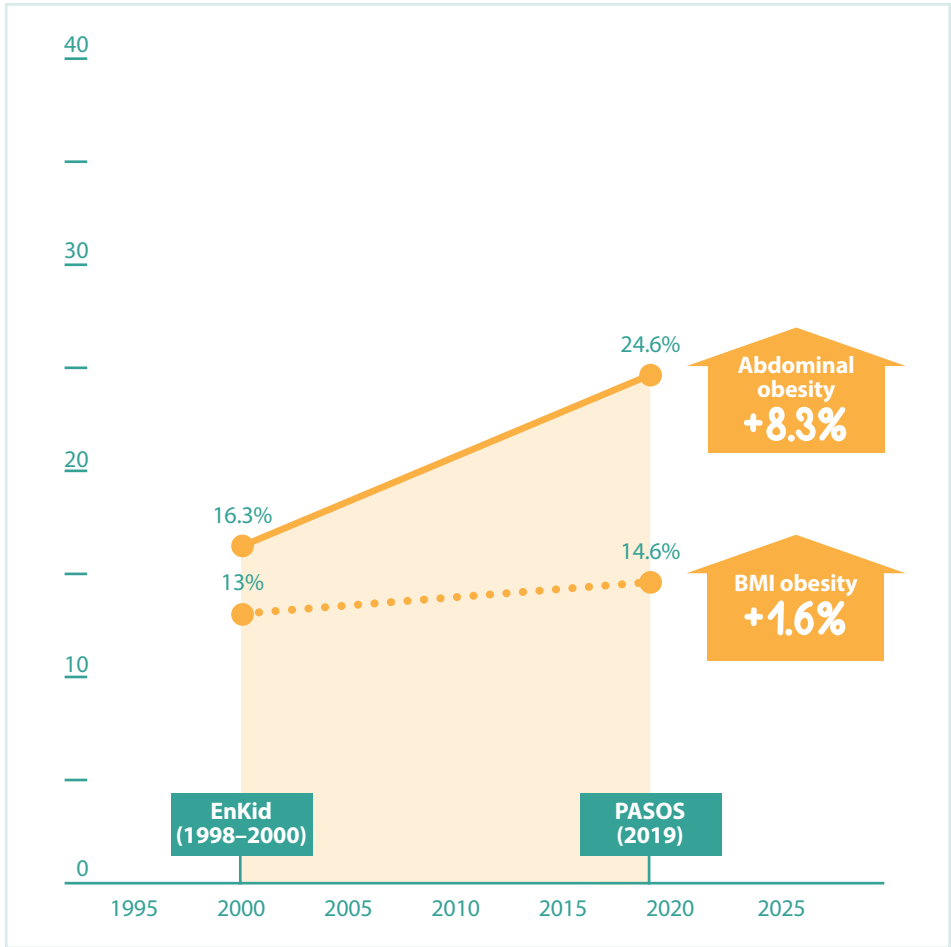
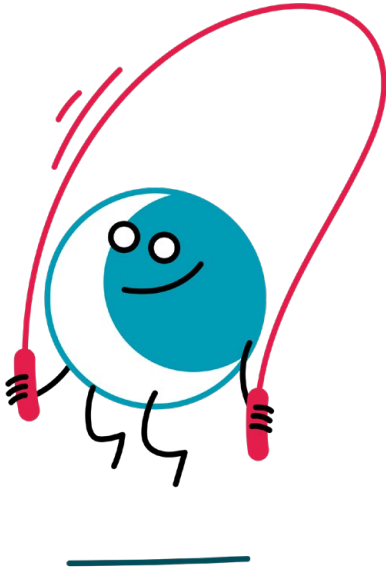


Figure 14 – Trends in the prevalence of childhood obesity and abdominal obesity in the last two decades using BMI and waist–height ratio.





# 11 POVERTY AND OBESITY

The results of the PASOS 2019 study also indicate relative poverty is associated with excess weight rates in Spain. The results correspond to 3,578 participants from 234 primary and secondary schools of 15 autonomous regions (the Basque Country and Navarra were excluded due to the lack of relative poverty data).

As observed in Figure 15, the prevalence of excess weight is 32.7% among the participants who attend a school located in an area with a relative poverty percentage of less than 10%. For the next range of relative poverty (10%–14.99%), the prevalence is slightly lower (32.2%) and, after that, it considerably increases with relative poverty, reaching the maximum value (39.5%) in participants who attend a school located in an area with a relative poverty percentage of 30%–39.9%. However, there is a lower prevalence of excess weight (34.2%) among the participants who attend a school with a relative poverty percentage higher than 40%, breaking the increasing linear trend observed between relative poverty and the prevalence of excess weight.

The greater the relative poverty, the higher the rate of excess weight in childhood until poverty level of 30%–40%.



**Figure 15** – Association between relative poverty and excess weight of children. Sources: INE and PASOS 2019.

## You should know:

In the sample of the PASOS study, the relative poverty rate (population with income lower than 60% of the median of the country per consumption unit, 2016) was identified for the census areas in which the participating schools were located. The relative poverty data are obtained from [distribution of household income from INE](#)<sup>59</sup>. The association of relative poverty and prevalence of excess weight (overweight + obesity) was studied using the measurements made *in situ* by the 13 research groups of the PASOS 2019 consortium.

There are multiple interpretations of this phenomenon and, probably, all of them will be linked to the excessive vulnerability to which the population group living in the highest poverty range is exposed. Several hypotheses have been formulated around this result. For example, it is likely that it is a population that benefits from health programmes such as free school lunch or, conversely, the economic situation of the family prevents accessing junk food that promotes childhood obesity. As mentioned, these are preliminary hypotheses formulated between the technical team of the UNICEF Spanish Committee and Gasol Foundation as a result of the report that both entities recently jointly presented<sup>60</sup>. These are also very recent results that the PASOS study consortium must analyse in greater depth.

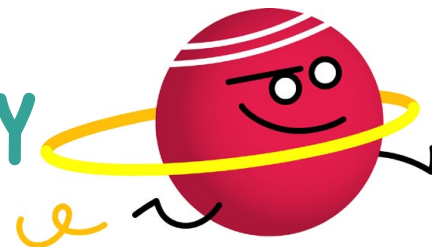
On the other hand, figure 16 shows the analysis of the association between relative poverty and childhood obesity (not including overweight). Specifically, the prevalence of childhood obesity was estimated using BMI and abdominal obesity (waist–height ratio) for participants who attend a school located in an area with a relative poverty percentage under 20% or greater than or equal to 20%. The prevalence of obesity using both BMI (15.6%) and abdominal obesity (26%) is higher in the higher relative poverty group, whereas in the lower group, the prevalence of childhood obesity using BMI is 13%, and 23.9% using abdominal obesity.

Therefore, the evidence that the PASOS study has started to generate reinforce the hypothesis that childhood poverty and obesity are associated. It additionally highlights the need for further analysis from a holistic perspective to establish the factors that determine this association to a greater extent.



**Figure 16** – Association between relative poverty and childhood obesity using BMI and waist–height ratio.

## 12 PHYSICAL ACTIVITY

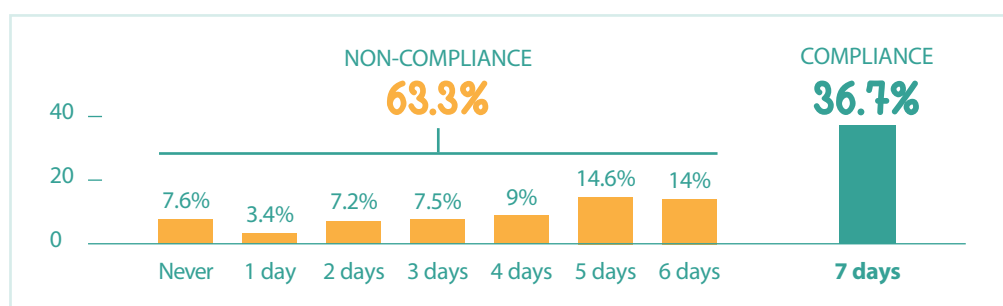


Physical activity is one of the determinants most strongly associated with the worldwide epidemic of childhood obesity.

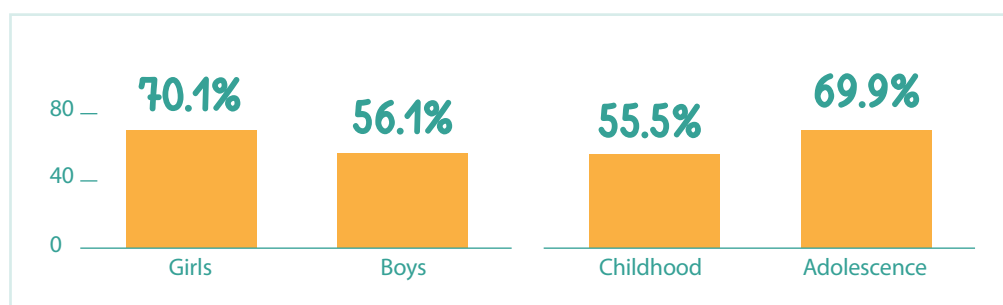
### PREVALENCE OF PHYSICAL INACTIVITY

The PASOS 2019 study shows that the percentage of children and teenagers that reach the WHO recommendation regarding the practice of moderate or vigorous physical activity is much lower than would be desirable. Specifically, figure 17 shows that 63.3% of the population aged 8 to 16 does not meet this recommendation. Conversely, 36.7% do achieve at least 60 minutes of physical activity seven days a week.

3 out of 5 children and teenagers do not meet the WHO recommendation for daily physical activity.



**Figure 17** – Prevalence of non-compliance/compliance with the recommendation of physical activity.



**Figure 18** – Prevalence of non-compliance with the recommendation of physical activity according to sex and life stage.

Non-compliance with the physical activity recommendation is greater in adolescence than in childhood and also greater among girls than boys.

#### You should know:

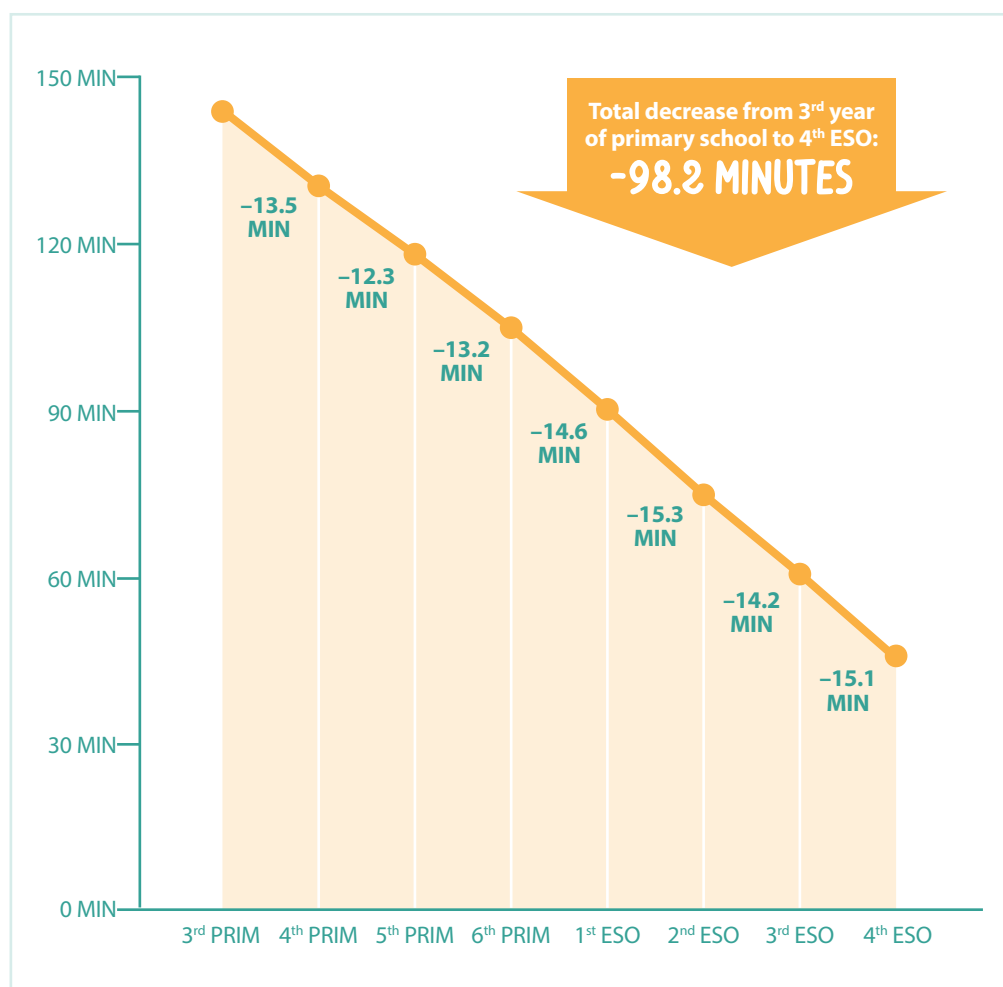
The WHO recommends practicing a minimum of 60 minutes of moderate or vigorous physical activity daily. Moderate or vigorous physical activity is understood as bodily movement that activates the heart rate and breathing. In children and teenagers, moderate or vigorous physical activity involves intense body movement such as running, jumping or dancing.



## AVERAGE OF MINUTES DEDICATED TO THE PRACTICE OF MODERATE OR VIGOROUS PHYSICAL ACTIVITY

Figure 19 shows the average decrease in daily minutes dedicated to the practice of moderate or vigorous physical activity among the different academic years participating in the PASOS 2019 study (3rd, 4th, 5th and 6th of primary school and 1st, 2nd, 3rd and 4th of ESO). In total, the average decrease between the youngest (3rd year, aged 8 to 9) and the oldest (4th year of ESO, aged 15 to 16) is 98.2 minutes daily. The average difference is very similar between boys (99.7 minutes daily) and girls (97 minutes daily) and, therefore, it is not represented in the graph for visual clarity.

Between the ages of 8 and 16, there is a decrease greater than a hour and a half in the minutes dedicated to the practice of physical activity daily.



**Figure 19** – Average daily minutes dedicated to the practice of physical activity according to academic year.

# PHYSICAL CONDITION

Figure 20 shows that 74.9% of the population studied considered their general physical fitness to be good/very good. Furthermore, regarding cardio-respiratory fitness, muscular strength, speed/agility, and flexibility, 70.5%, 65.7%, 68.9%, and 44.7%, respectively, consider them to be good/very good.

Analysing only self-perception of general physical fitness, in figure 21 we observe that the rate of participating girls who consider it to be good/very good (73.3%) is slightly lower than for boys (76.4%). Also in figure 21, we observe that the percentage of children who consider their general physical fitness to be good/very good (84.8%) is higher than that of teenagers (66.6%).

## You should know:

Physical fitness was measured with the **International Fitness Scale**<sup>52</sup>, which allows the classification of self-perception of general physical fitness, cardio-respiratory fitness, muscular strength, speed/agility and flexibility into 5 categories: very bad, bad, average, good, and very good. For the analysis, and to summarise the results, the very bad and bad categories were combined, as were the good and very good categories.

The physical condition with the greatest scope for improvement among Spanish children and teenagers is flexibility.

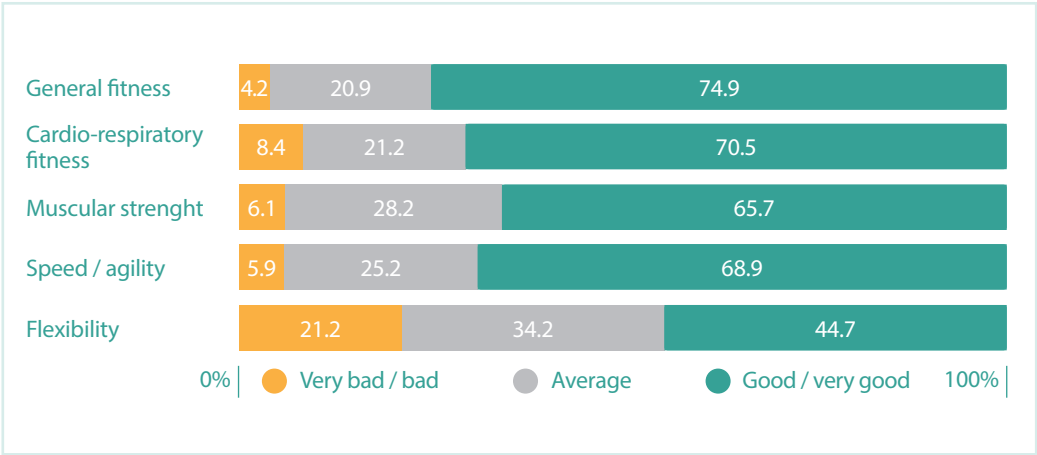


Figure 20 – Self-perception of physical fitness for 5 items.

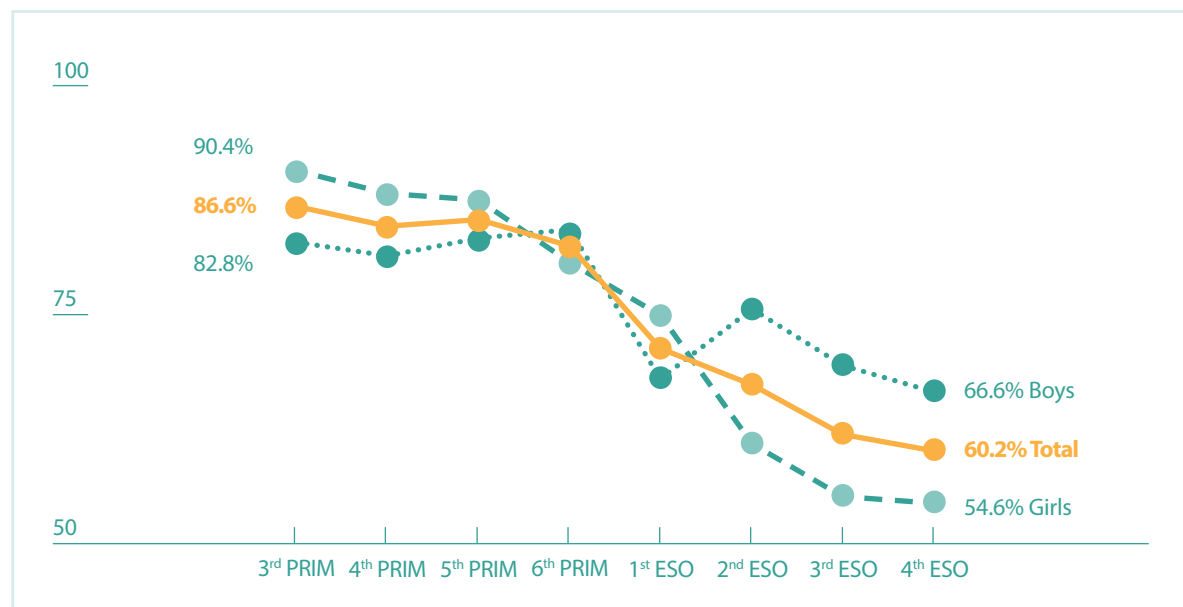
Teenagers (both sexes) and girls have a poorer perception of their general physical fitness.



Figure 21 – Self-perception of general physical fitness according to sex and life stage. B = boys; G = Girls; C = childhood; A = adolescence.



Finally, in figure 22 we observe that the percentage of participants who consider their general physical fitness to be good/very good decreases with age, according to the academic years studied. In fact, the total decrease between the participants from the 3<sup>rd</sup> year of primary school and those in 4<sup>th</sup> year of the ESO is 26.4%; the decrease is much greater in girls (35.8%) than in boys (16.2%).



**Figure 22** – Self-perception of general physical fitness according to sex and academic course.

The cross-sectional data from the PASOS 2019 study show that self-perception of general physical fitness deteriorates throughout the last stage of childhood and adolescence, and is much greater in girls.



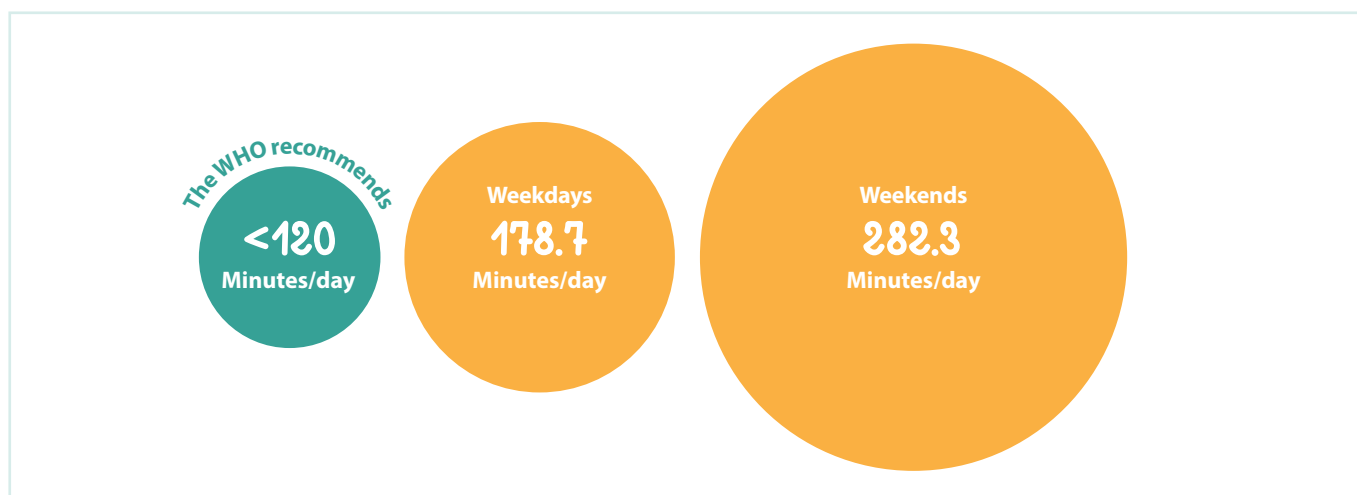
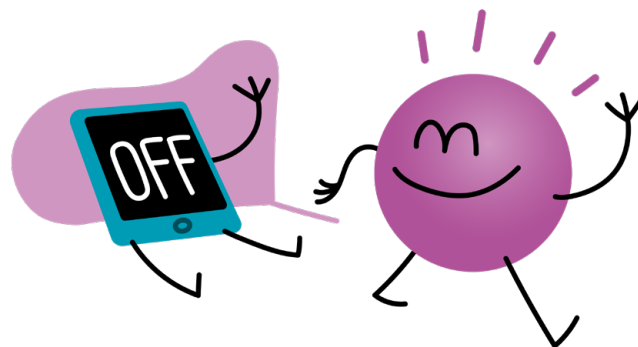
## 13 USE OF SCREENS

Spanish and international studies point out that the use of screens has grown significantly in the last few decades among children and teenagers. This habit is related to excessive sedentarism and the decrease in the hours of sleep or quality of life in general.

### AVERAGE SCREEN USE

Figure 23 shows the connection between the maximum amount of daily minutes of screen time recommended by the WHO and the minutes spent on weekdays and weekends for the representative sample of the Spanish children and teenagers participating in the PASOS 2019 study. The average number of minutes spent using screens on weekdays exceeds the WHO recommendation by 58.7 minutes/day (practically one hour per day) and, on weekends, the recommendation is exceeded by 162.3 minutes/day (two hours and forty-two minutes per day).

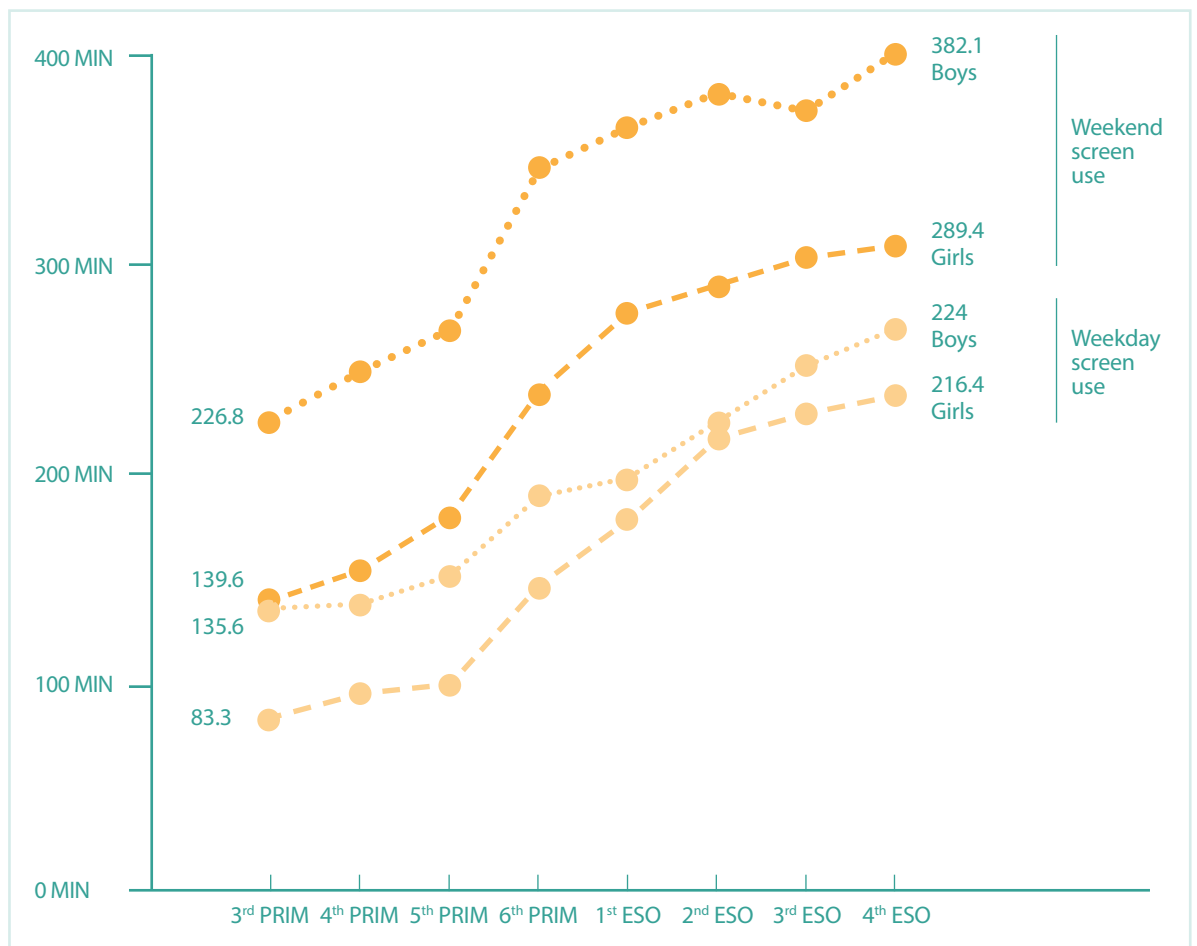
Children and teenagers in Spain exceed the WHO recommendation on the use of screens on weekdays by practically 1 hour per day and by more than 2 hours and 40 minutes on weekends.



**Figure 23** – Average minutes per day spent using screens during weekdays and weekends.

#### You should know:

The WHO recommends a maximum screen time use of 120 daily minutes for both children and teenagers (aged 5 to 17), both for weekdays and weekends. Use of screens is associated with a higher degree of sedentarism, less cognitive stimulation, a decrease in hours of sleep and an impoverishment of social relationships of children and teenagers.



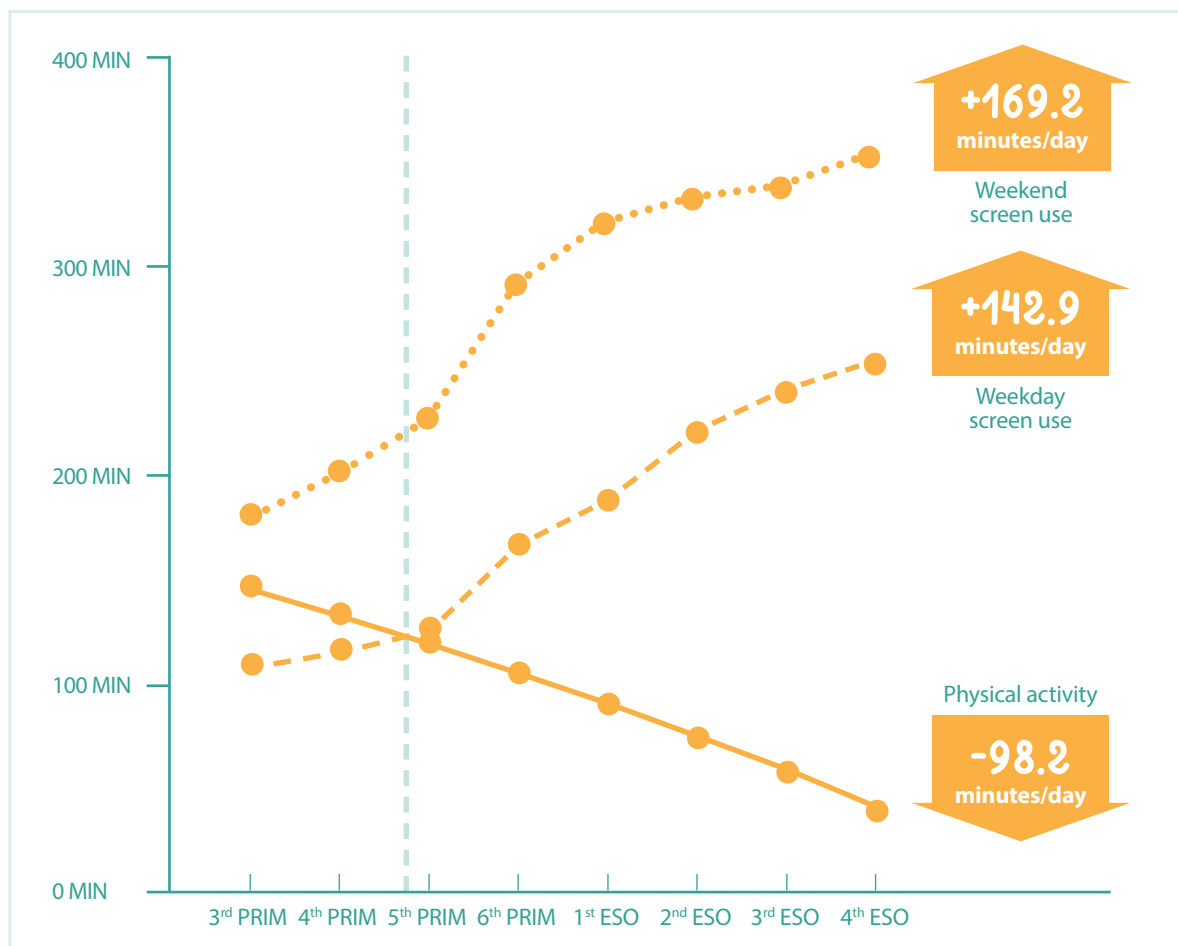
**Figure 24** – Average daily minutes devoted to screen use during weekdays and weekends according to sex and academic year.

Figure 24 shows that the average number of minutes of screen use during weekdays and weekends is much higher for teenagers in the 4<sup>th</sup> year of ESO than for the children in the 3<sup>rd</sup> year of primary school. Screen time use increases similarly for each of the academic years studied, according to sex, but both in 3<sup>rd</sup> year of primary school and in 4<sup>th</sup> year of ESO, boys spend many more minutes per day using screens on weekdays and, especially, on weekends.

Figure 25 shows the average number of daily minutes devoted to physical activity and screen use during weekdays and weekends, according to the academic year. A decreasing linear trend is observed for physical activity (already evidenced in figure 19) and an increasing linear trend is shown for the use of screens, both during weekdays and weekends (total average values in figure 24). In 5<sup>th</sup> year of primary school, there is a critical point where the line that represents daily minutes devoted to physical activity crosses that of minutes of screen use on weekdays. After this critical point, the difference between the average time devoted to both activities increases progressively until, in 4<sup>th</sup> of ESO, the participants spend only 45.6 daily minutes practicing physical activity and over 200 daily minutes to using screens during weekdays and over 353 daily minutes on weekends.

Girls devote less time to screen use than boys, with the greater difference between both seen in the use of screens on weekends.

Preventive policies and interventions should focus on avoiding the decline in physical activity and the increase in screen use before the age of 10 (5<sup>th</sup> year of primary school), while reinforcing health promotion initiatives during adolescence.

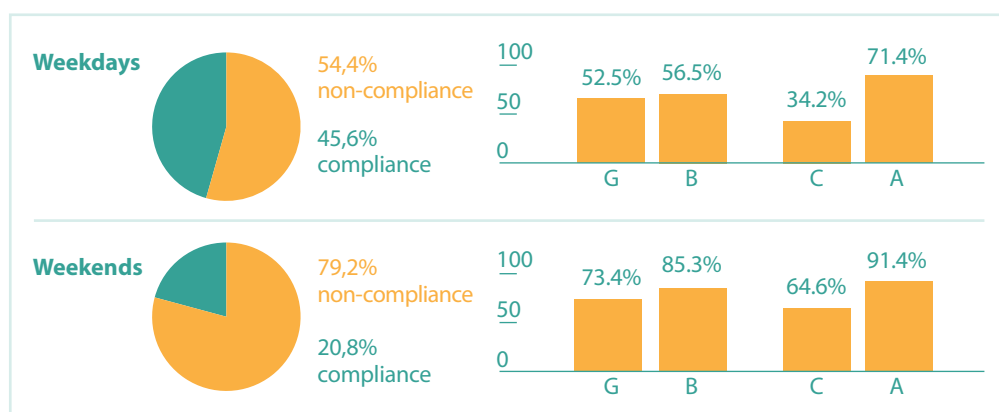


**Figure 25** – Average daily minutes devoted to physical activity and screen use during weekdays and weekends according to sex and academic year.

## FULLFILMENT OF RECOMMENDATIONS

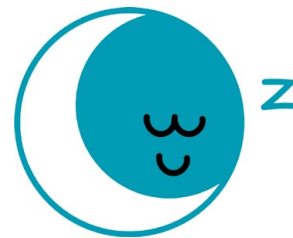
Figure 26 shows that 54.4% of the young population does not comply with the WHO recommendation regarding the daily use of screens on weekdays. Non-compliance rises to 79.2% for screen use on weekends. The percentage of non-compliance is higher among boys, both during weekdays (56.5%) and weekends (85.3%) compared to girls (52.5% and 73.4%, respectively). Figure 26 also shows that non-compliance is higher among teenagers both during weekdays (71.4%) and weekends (91.4%), compared to children (34.2% and 64.6%, respectively).

A high percentage of children and teenagers do not comply with the recommendation of screen use, especially on weekends. The percentage of non-compliance is higher among teenage boys.



**Figure 26** – Prevalence of non-compliance/compliance with the WHO recommendation regarding the daily use of screens during weekdays and weekends: total and according to sex and academic year.  
B = boys; G = Girls; C = childhood; A = adolescence.

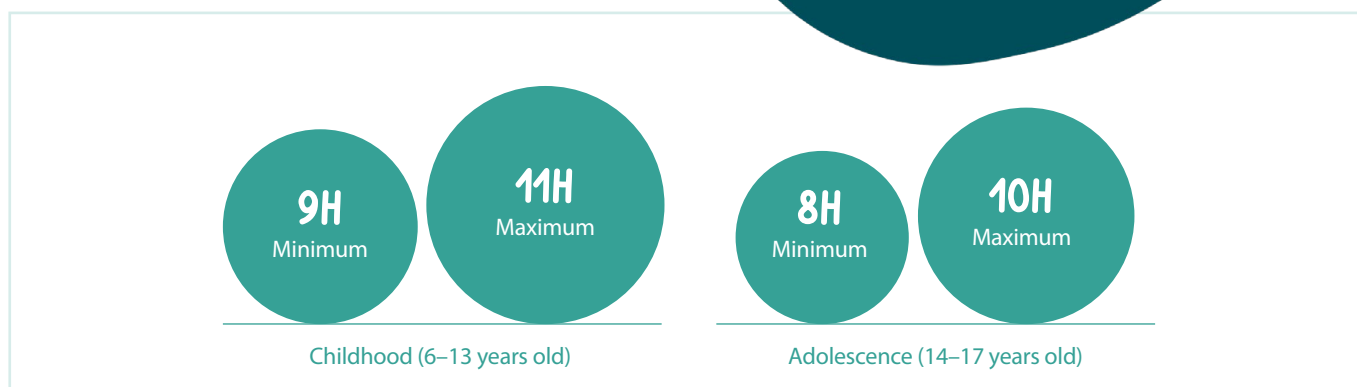
# 14 HOURS OF SLEEP



The hours and quality of sleep are a determining factor that is strongly associated with the probability of being overweight or obese throughout childhood and adolescence.

## You should know:

The **National Sleep Foundation**<sup>61</sup>, a leading entity in sleep research, establishes recommendations for hours of sleep according to age ranges. For children aged 6 to 13, between 9 and 11 hours of daily hours of nighttime sleep are recommended. For the adolescent population aged 14 to 17, between 8 and 10 hours are recommended (figure 27)



**Figure 27** – Recommended ranges of daily hours of sleep according to life stage.



# AVERAGE HOURS OF SLEEP

In figure 28, we observe that the average number of hours of sleep for children participating in the PASOS 2019 study is within the recommended range, both on weekdays (9.34 hours per day) and weekends (10.15 hours per day). For teenagers, the average number of hours of sleep on weekdays (7.9 hours per day) is slightly below the recommended time, and is within the recommended range on weekends (9.4 hours per day).

Also in figure 28, the average daily hours of sleep between boys and girls in childhood are very similar on weekdays, and higher for girls (10.31 h) on weekends, but always within the recommended range. However, in adolescence, the average daily hours of sleep on weekdays for girls (7.79h) is below the minimum recommended range indicates, while the average for boys is within the recommended range. The average number of daily hours of sleep for teenagers on weekends is within the recommended range (8 to 10 hours of sleep per day).

The average weekly hours of sleep for teenagers is below the minimum range of the recommendations.

Overall, teenage girls sleep fewer hours on weekdays (on average) than recommended.

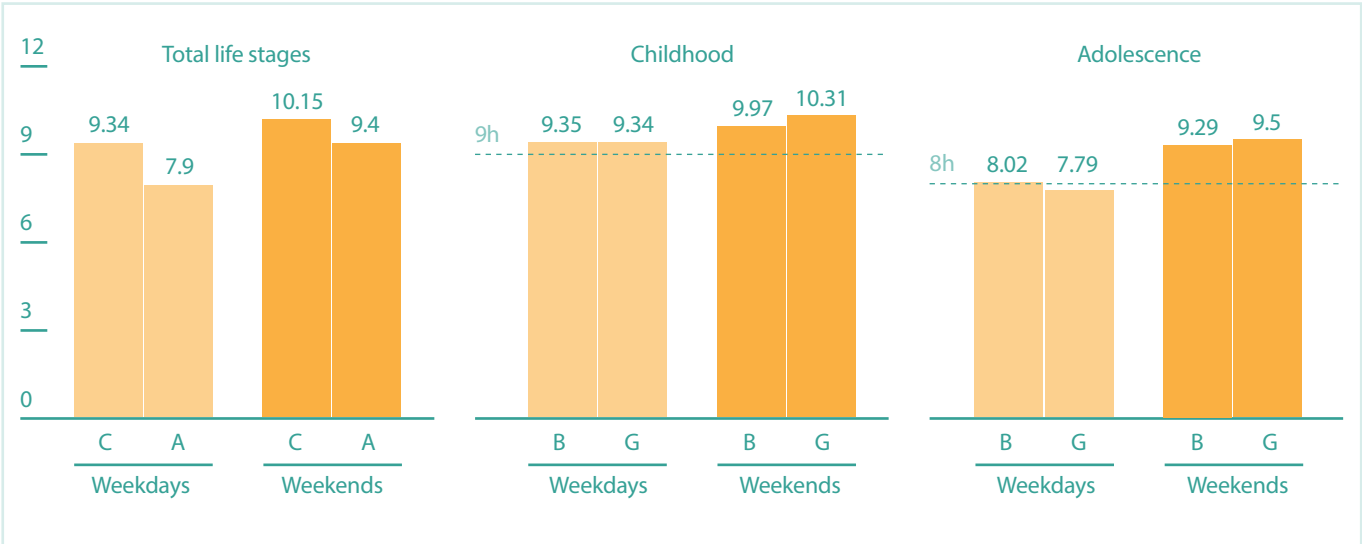
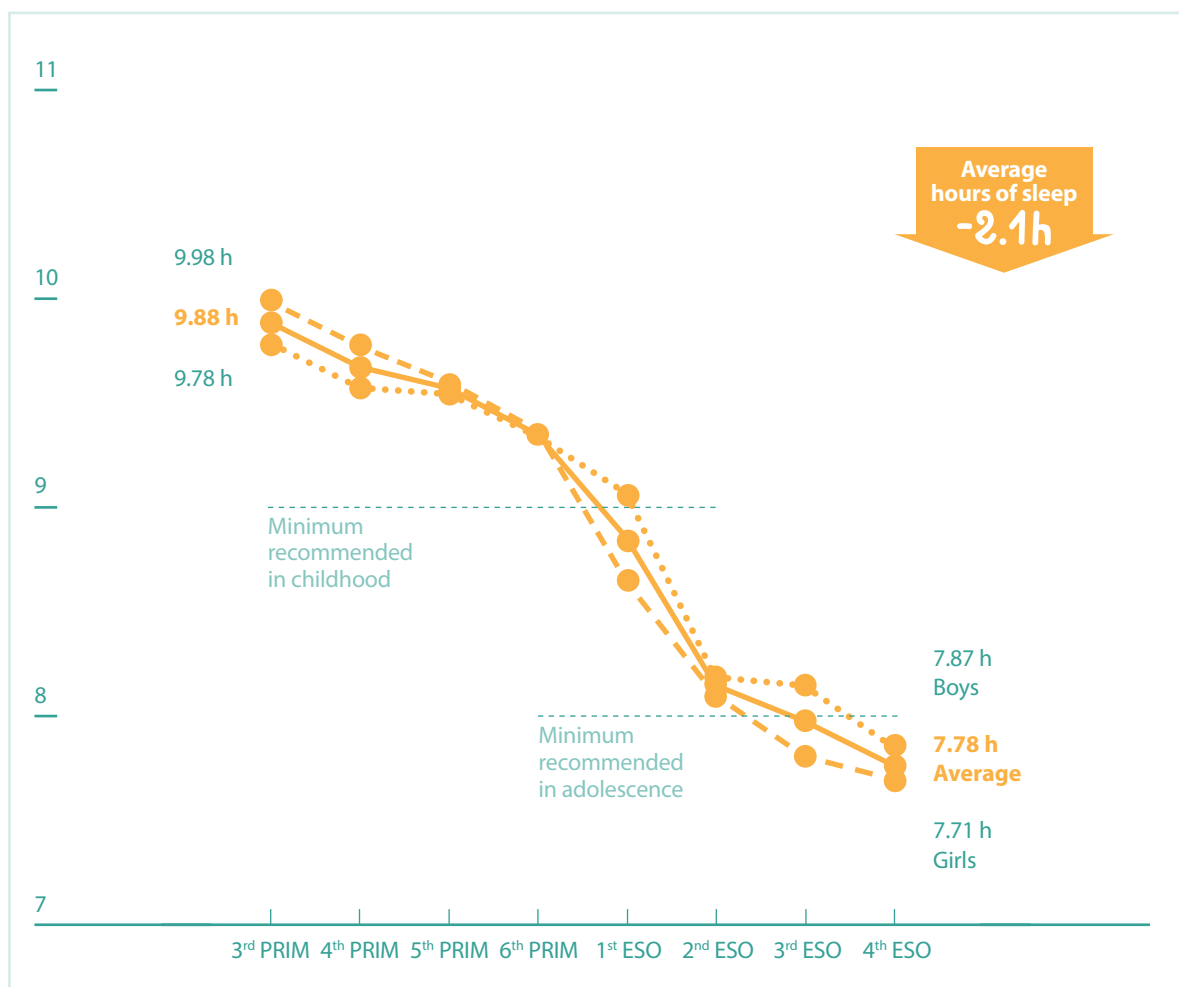


Figure 28 – Average hours of daily sleep on weekdays and weekends: total and by sex and life stage. B = boys; G = Girls; C = childhood; A = adolescence.



**Figure 29** – Average daily hours of sleep on weekdays according to sex and academic year.

Figure 29 shows that the average number of hours of daily sleep on weekdays is lower at older ages, according to the academic years studied. Specifically, we observe that in 4<sup>th</sup> year of ESO, the average number of hours of sleep for boys and girls is under 8 hours per day, which is below those recommended for teenagers over 14 years old.

In figure 30, the average daily hours of sleep on weekends decrease with age and academic advancement, but are still within the recommended range for each life stage.

Teenagers in the 4<sup>th</sup> year of ESO (aged 15 to 16) sleep fewer hours than those recommended for full physical, psychological and social development.

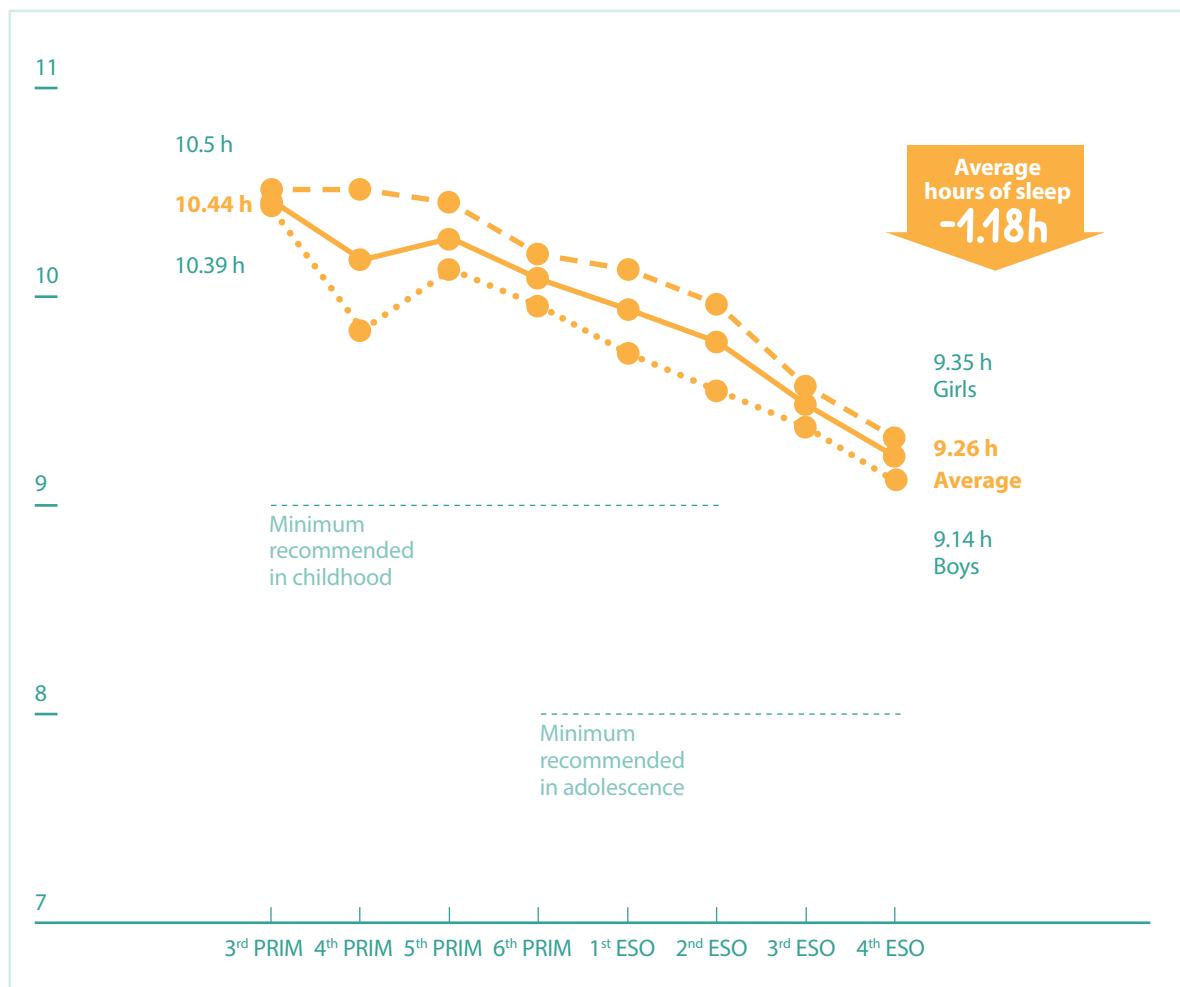
## COMPLIANCE WITH RECOMMENDATIONS

Figure 31 shows that 40.9% of the participants of the PASOS 2019 do not comply with the recommended daily hours of sleep on weekdays, and non-compliance rises to 48.1% during weekends.

In figure 31, we can also observe that non-compliance with the recommendations for weekdays is higher in girls (43.1%) than boys (38.7%), whereas on weekends, non-compliance is higher in boys (49%) than in girls (47.2%).

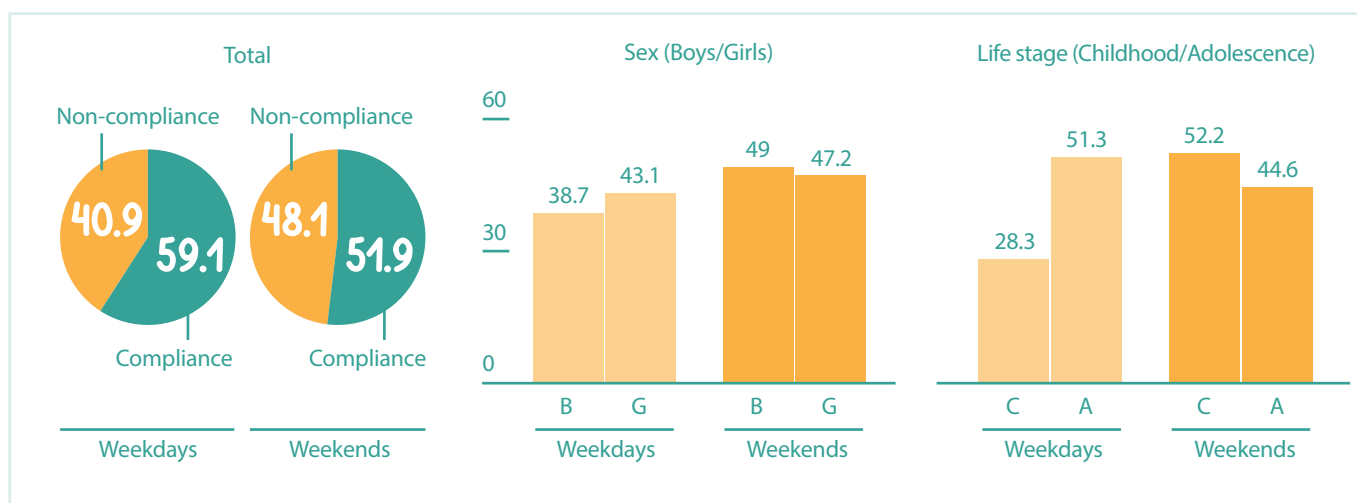
Also in figure 31, non-compliance with the recommended daily hours of sleep during weekdays is higher among teenagers (51.3%) than children (28.3%). On the other hand, on weekends, non-compliance is greater among children (52.2%) than among teenagers (44.6%), although the difference is smaller.

Almost half of the young population in Spain does not meet the recommended daily hours of sleep during weekdays and weekends.



**Figure 30** – Average daily hours of sleep on weekends according to sex and academic year.

Non-compliance with the daily recommended hours of sleep on weekdays is greater in teenagers than in children.



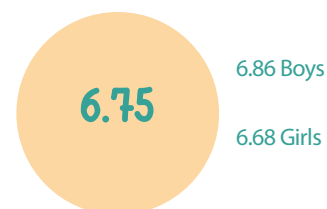
**Figure 31** – Prevalence of non-compliance/compliance with the recommendations of the National Sleep Foundation regarding daily hours of sleep on weekdays and weekends: total and by sex and life stage. B = boys; G = Girls; C = childhood; A = adolescence.

International scientific evidence has shown that one of the key determinants of childhood obesity is eating habits and quality of diet.

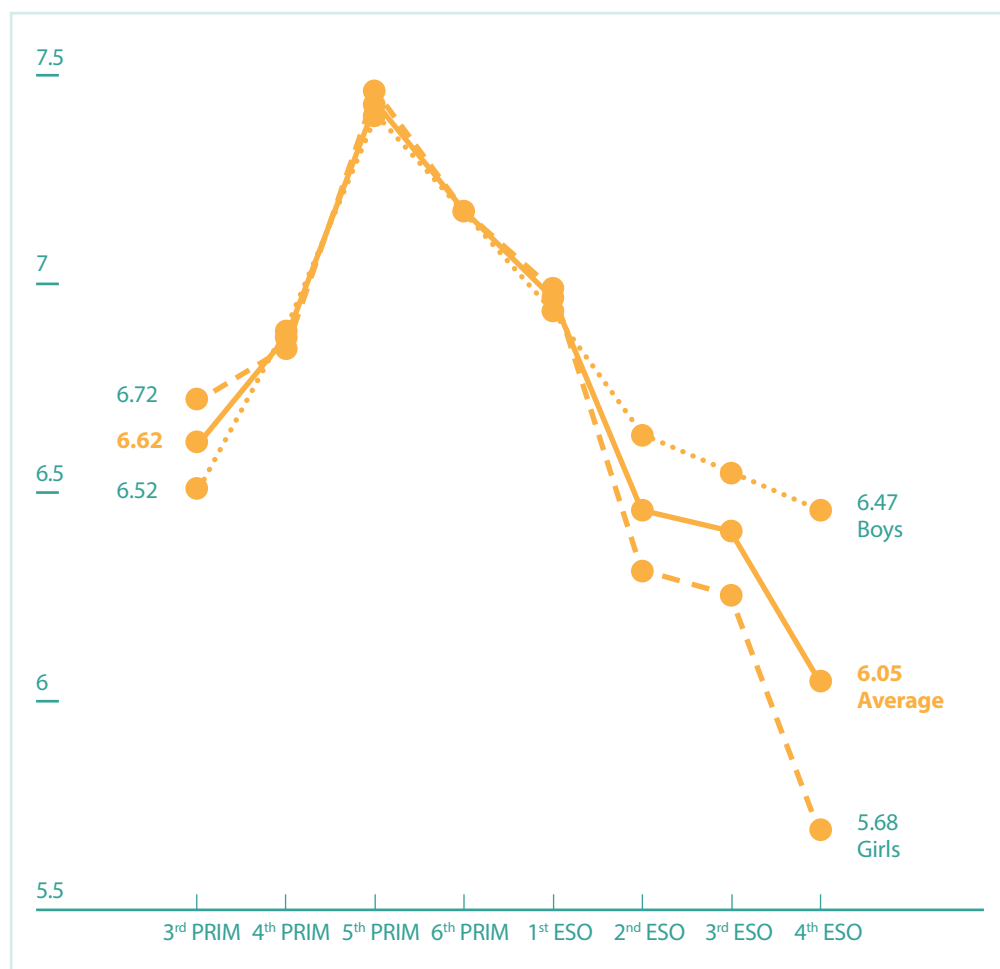
## LEVEL OF ADHERENCE TO THE MEDITERRANEAN DIET

In the PASOS 2019 study, the average level of adherence to the Mediterranean diet was 6.75 points (range, -4 to 12). As shown in figure 32, the average is higher in boys (6.86) than in girls (6.68).

Figure 33 shows the differences in the average level of adherence to the Mediterranean diet according to sex and academic year. Adherence between the 3rd year and the 5th year is higher as age increases, reaching a maximum score for 5th year participants. After this course, the level decreases significantly as age increases, reaching the lowest average score of 6.05 points. Given the cross-sectional nature of this study, we cannot know if the children who were in 5th year of primary school during the 2019 PASOS study had a higher level in 3<sup>rd</sup> or 4<sup>th</sup> year of primary school or if, on the contrary, they came from a lower level. Representative longitudinal studies to are necessary to study this and other phenomena.



**Figure 32** – Average level of adherence to the Mediterranean diet by sex.



**Figure 33** – Average level of adherence to the Mediterranean diet according to sex and academic year.

### You should know:

Eating habits have been measured using the KidMed index<sup>48</sup>, which was created, validated and applied in the context of the EnKid study (1998–2000). It contains 16 dichotomous response items (Yes/No), of which 12 are favourable to the Mediterranean diet pattern and 4 are unfavourable to this pattern. The questionnaire produces a total score that ranges from -4 to 12 and indicates the level of adherence to the Mediterranean diet.

### Three levels of adherence

are established:

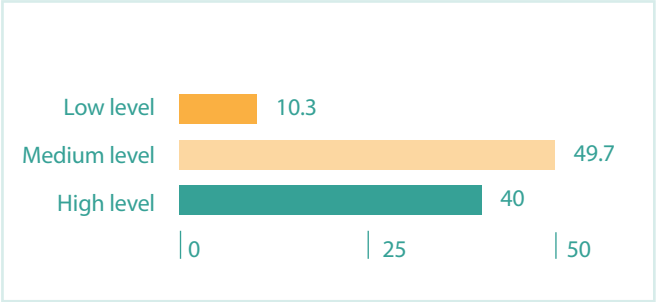
- \_Low level  
(score from -4 to 3 points)
- \_Medium level  
(score from 4 to 7 points)
- \_High level  
(score of 8 to 12 points)



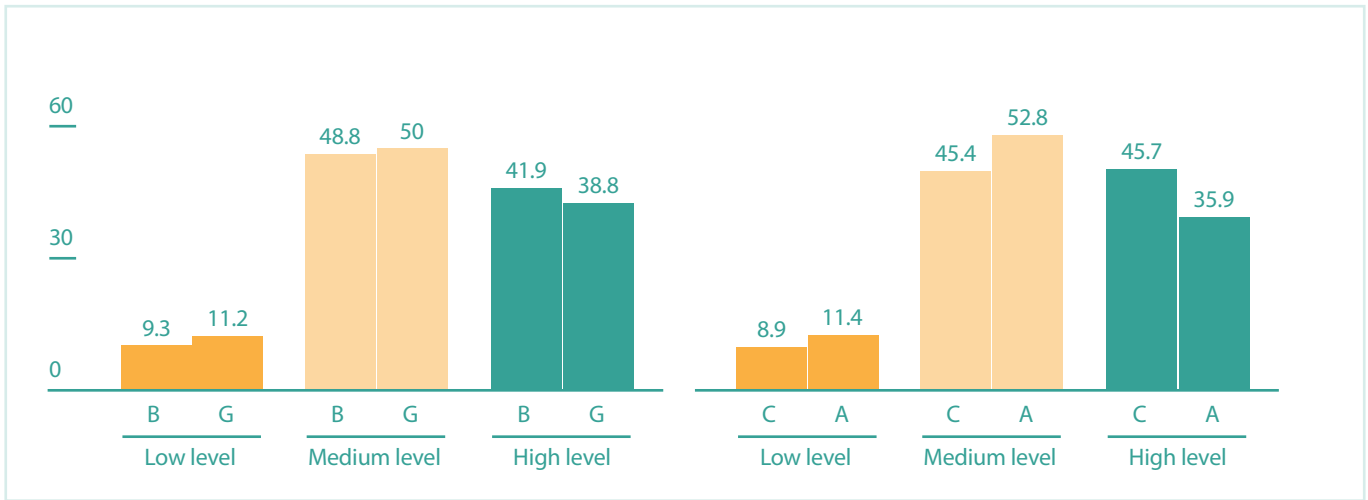
Longitudinal studies are necessary to study aspects that cross-sectional studies, such as PASOS 2019, cannot analyse. Regarding eating habits, we cannot know if there is a decreasing linear trend in the level of adherence to the Mediterranean diet throughout childhood and adolescence.

Figure 34 shows that, currently, 10.3% of Spanish children and teenagers have a low level of adherence to the Mediterranean diet, 49.7% have a medium level, and 40% have a high level.

Figure 35 shows that the percentage of girls with a low level of adherence to the Mediterranean diet (11.2%) is slightly higher than that of boys (9.3%). In contrast, the percentage of girls with a high level (38.8%) is slightly lower than that of boys (41.9%). In the same figure 35, we can see that the percentage of children that present a high level of adherence to the Mediterranean diet (45.7%) is 9.8% higher than that of the adolescent population (35.9%). Furthermore, the percentage of teenagers that present a low level (11.4%) is 2.5% higher than that of children (8.9%).



**Figure 34** – Percentage of the young population with a low, medium or high level of adherence to the Mediterranean diet.



**Figure 35** – Percentage of the young population with a low, medium or high level of adherence to the Mediterranean diet according to sex and life stage. B = boys; G = Girls; C = childhood; A = adolescence.

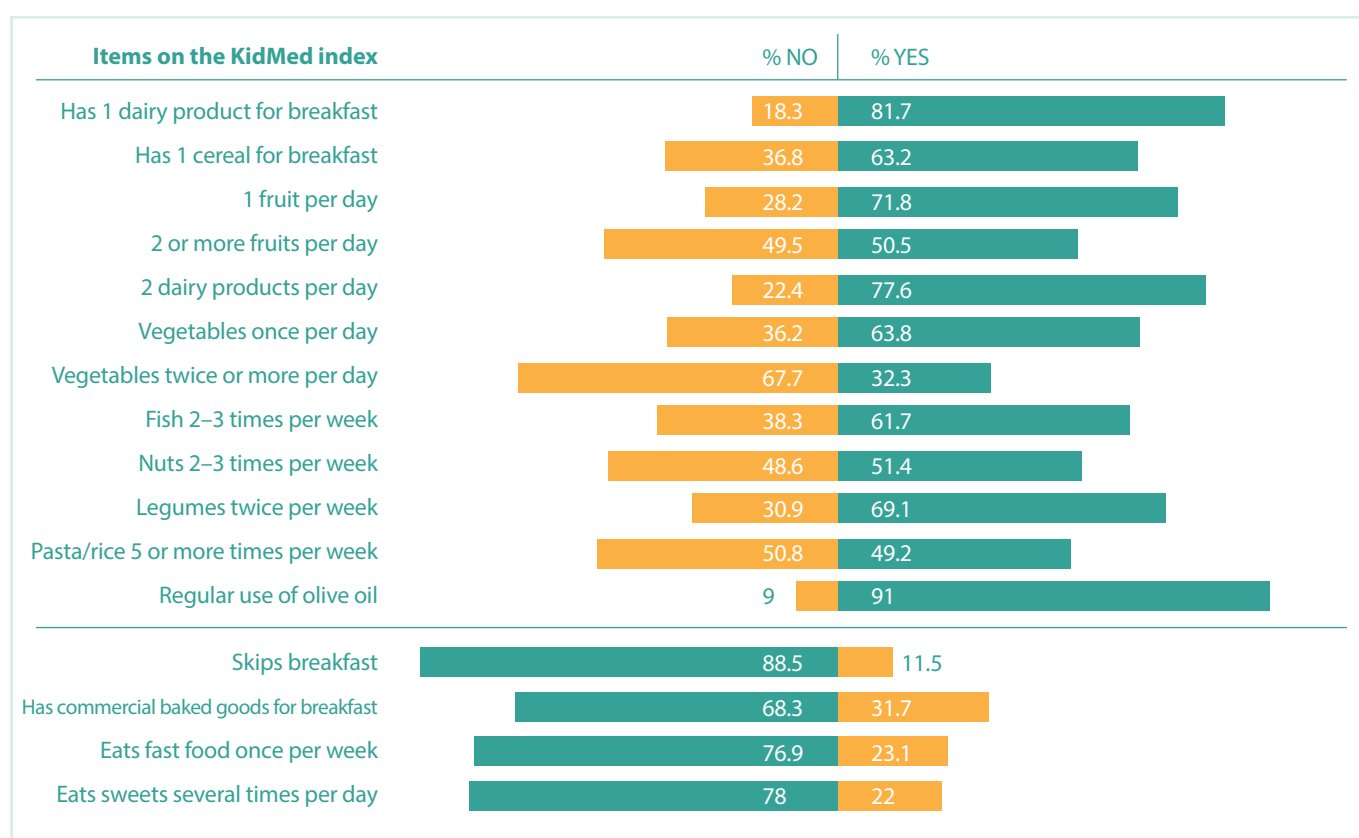
Only 40% of children and teenagers in Spain have a high level of adherence to the Mediterranean diet.



## KEY ASPECTS OF YOUNG POPULATION EATING HABITS

This report also presents the results derived from the analysis of the KidMed index for each of the 16 items that make up the questionnaire. Figure 36 shows that 11.5% of the studied population stated they skip breakfast regularly, 31.7% eat commercial baked goods for breakfast, 23.1% eat at least once a week in a fast-food restaurant, and 22% eat sweets several times per day. Additionally, only 50.5% consume at least 2 pieces of fruit per day and only 32.3% consume at least two servings of vegetables daily. It should also be noted that, regarding weekly recommendation for consumption of fish, nuts, legumes, and pasta or rice, 38.3%, 48.6%, 30.9% and 50.8%, respectively, do not meet them. Conversely, the vast majority of the young population (91%) declared that olive oil is regularly used in their homes.

The percentage of the young population that state they follow certain unhealthy habits, such as skipping breakfast, eating commercial baked goods, eating at least once a week in a fast-food restaurant, or consuming sweets daily is much higher than what would be desirable and recommended.



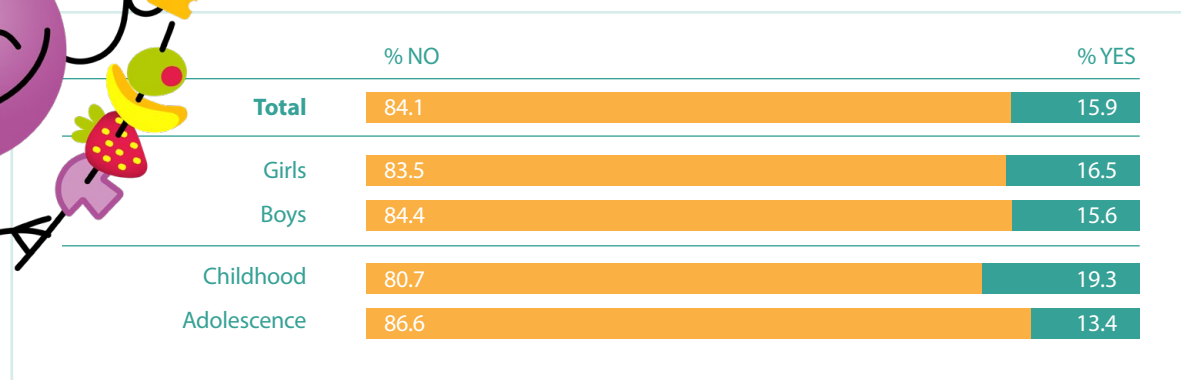
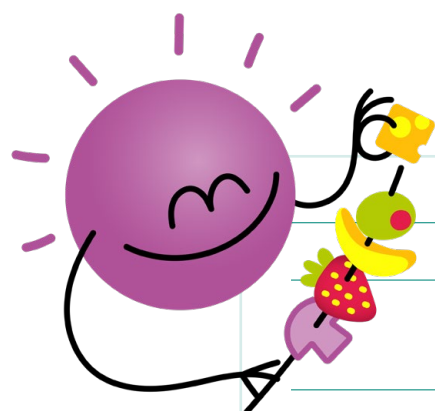
**Figure 36** – Percentage of the young population that reports following each of the eating habits included in the 16 items that make up the KidMed index.

### You should know:

The Mediterranean diet pattern has been recognised by international competent bodies as a healthy diet pattern that contributes to reducing multiple general health risks and to promotes healthy development in childhood and adolescence. This diet pattern is characterised by a high consumption of fruits and vegetables (recommendations indicate 5 servings per day), legumes (2 to 4 servings per week), nuts (2–3 times per week), fish (2–3 times per week), and the use of olive oil for cooking or dressings. It is also characterised by the consumption of unprocessed or moderately processed local products.

## CONSUMPTION OF FRUITS AND VEGETABLES

In figure 37 we observe that only 15.9% of the population of the PASOS 2019 study consumes at least 4 servings of fruit and vegetables per day. It should be noted that the recommended amount is 5 daily servings, therefore, the percentage that reaches this recommendation is even lower. Non-compliance is slightly lower in girls (83.5%) than in boys (84.4%), and is higher in adolescence (86.6%) than in childhood (80.7%).



**Figure 37** – Percentage of the young population that state they consume at least 4 daily servings of fruits and vegetables, according to sex and life stage.

A very low percentage of children and teenagers in Spain consumes at least 4 daily servings of fruit and vegetables. This habit is scarce among both girls and boys, and somewhat more among teenagers than children.

### You should know:

The consumption of 5 daily servings fruits and vegetables is recommended: two or three fruits and two or three servings of vegetables. The KidMed index includes an item that allows to collect information regarding consumption of at least 2 pieces of fruit per day and another item regarding consumption of at least 2 servings of vegetables per day. Therefore, the results presented in this section correspond to the population that consumes at least 4 servings of fruit and vegetables per day (they may be more) and, therefore, is close to the recommendation.



## TRENDS IN FOOD HABITS IN THE LAST 2 DECADES

In 2000, the average level of adherence to the Mediterranean diet was 7.2 points on a scale that ranges from -4 to 12, as abovementioned. Nineteen years later, we find that this level of adherence to the Mediterranean diet has decreased, and the average currently is 6.75 points.

Figure 38 compares the percentage of children and teenagers that, in 2000, had a low, medium or high level of adherence to the Mediterranean diet, and how these percentages have changed until 2019. Currently, there are 6.5% more children and teenagers with a low level of adherence to the Mediterranean diet, and 4.7% less with a high level of adherence.



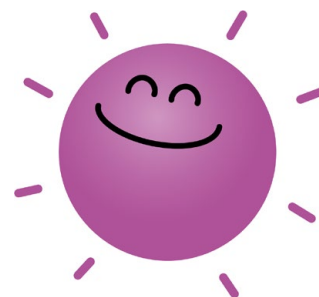
**Figure 38** – Trends in the level of adherence to the Mediterranean diet in the last two decades.

### You should know:

To evaluate eating habits, the PASOS 2019 study has used the KidMed index, which has allowed to study trends in eating habits in the last two decades for the population aged 8 to 16. In order to precisely compare the results of both studies, the population of the same age range was selected from both studies, aged 8 to 16.



## 16 QUALITY OF LIFE

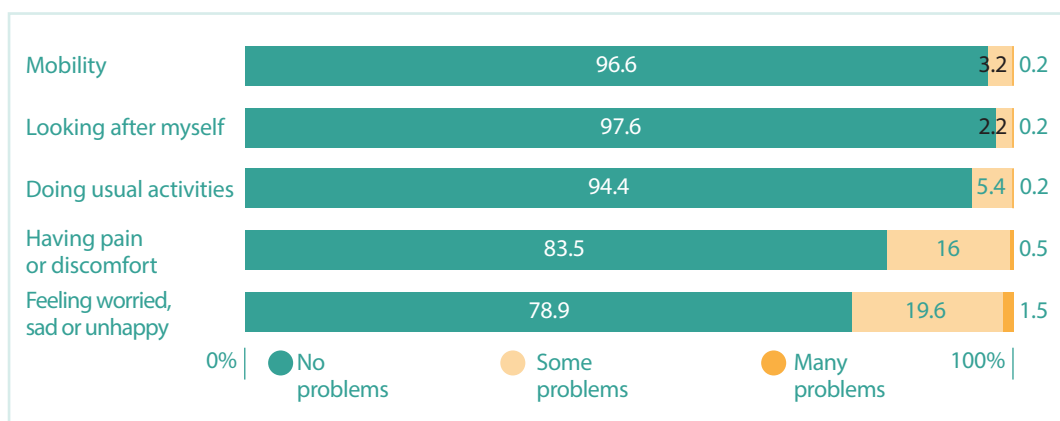


Quality of life and the factors or dimensions that comprise it may act both as causes and consequences of the obesity epidemic and the deterioration of healthy lifestyles in the population.

### ASPECTS RELATED TO THE QUALITY OF LIFE

Figure 39 shows the percentage of children and teenagers that state having no problems, some problems, or many problems regarding the 5 dimensions of the quality of life questionnaire used in the PASOS 2019 study. The items for which a higher percentage of participants indicate having some or many problems are “having pain or discomfort” (16.5%) and “feeling worried, sad or unhappy” (21.1%). Both items are closely connected to emotional well-being, one of the planets in the Healthy Galaxy that the Gasol Foundation uses to summarise the key determinants of the childhood obesity epidemic.

The items of quality of life most connected to emotional well-being (“having pain or discomfort”; “feeling worried, sad or unhappy”) are those for which the highest percentage of the young population state they have some or many problems.

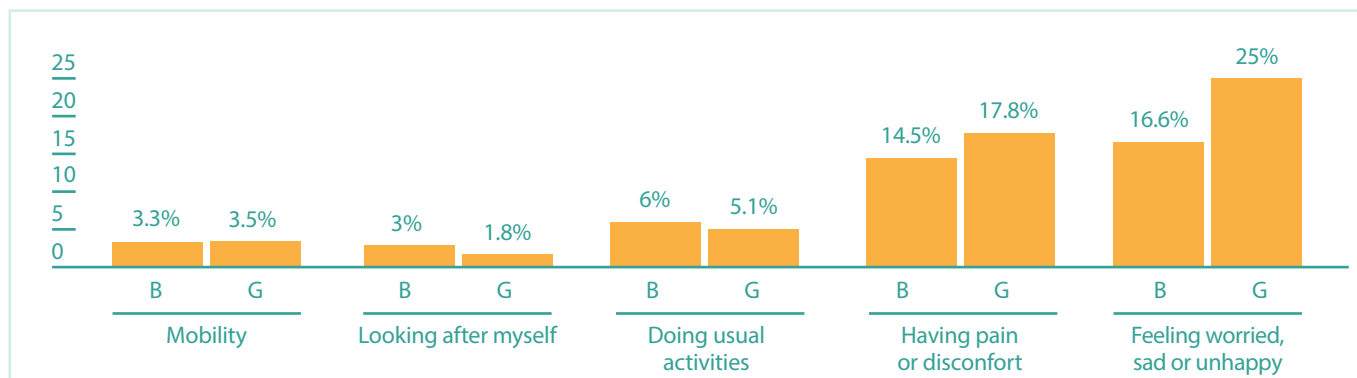


**Figure 39** – Percentage of the young population that reports having no, some, or many problems for each of the five items that comprise the quality of life questionnaire.

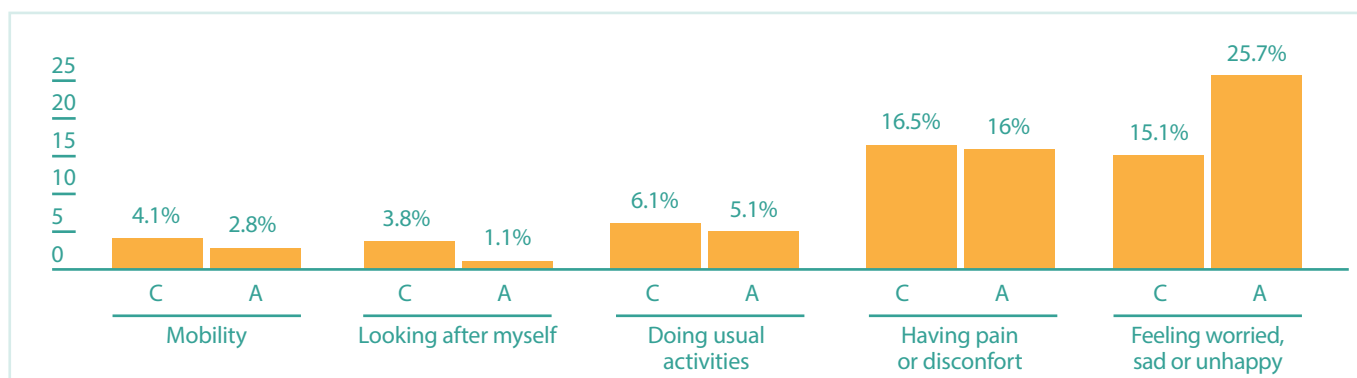
#### You should know:

In the PASOS 2019 study, two quality of life questionnaires derived from the EuroQol European consortium<sup>62</sup> were used. Both assess the same five items related to quality of life and include a question about the perceived state of health. The main difference between the two is that one considers three response categories for each of the items/questions/dimensions, and the other includes five. This report presents the results of the questionnaire with three response categories, since it is the one with currently the most scientific evidence regarding its validity and reliability, given that the first validation studies date from 1990. In the framework of the PASOS 2019 study, the data obtained will be used to validate the questionnaire with five categories in a representative sample of Spanish children and teenagers.





**Figure 40** – Percentage of young population that reports having some or many problems for each of the 5 dimensions of quality of life, according to sex. B = boys; G = Girls.



**Figure 41** – Percentage of children and youth population that reports having some or many problems for each of the 5 dimensions of quality of life, according to life stage. C = childhood; A = adolescence.

Figure 40 shows that there are important differences between boys and girls for some of the dimensions studied regarding the quality of life of children and teenagers. These differences are very evident for the dimension “feeling worried, sad or unhappy”, for which the percentage of participating girls who declared having some or many problems for this dimension was 25%, and it was 16.6% for boys.

In figure 41, the dimension “feeling worried, sad or unhappy” is shown to be higher among teenagers, since 25.7% state that they have some or many problems in this dimension, compared to 15.1% of children.

A higher percentage of teenagers declares “feeling worried, sad or unhappy”, compared to children.

There are major differences between boys and girls regarding the quality of life dimension that is most strongly connected to emotional well-being: “feeling worried, sad or unhappy”. A higher percentage of girls declared having some or many problems in this regard.

## PERCEIVED HEALTH STATUS

The quality of life questionnaire used in PASOS 2019 also includes a question about self-perception of health status on a scale of 0 to 100 (with 100 being an optimal health status). In figure 42, the average perceived health status is higher in children (89.4 points) than in teenagers (84.4 points). The differences between boys and girls regarding this question are minimal.

Finally, figure 43 shows the differences in the average perceived health status between the different academic years studied. Major differences are observed between sexes, since the perceived health status is 12 points lower for teenage girls in the 4<sup>th</sup> year of ESO compared to girls in the 3<sup>rd</sup> year of primary school. This difference is 5.2 points in the case of male participants. The average is higher among girls in the 3<sup>rd</sup> year of primary school (92.6 points) compared to boys (88.9 points).

The perceived health status deteriorates faster with age among girls than among boys.

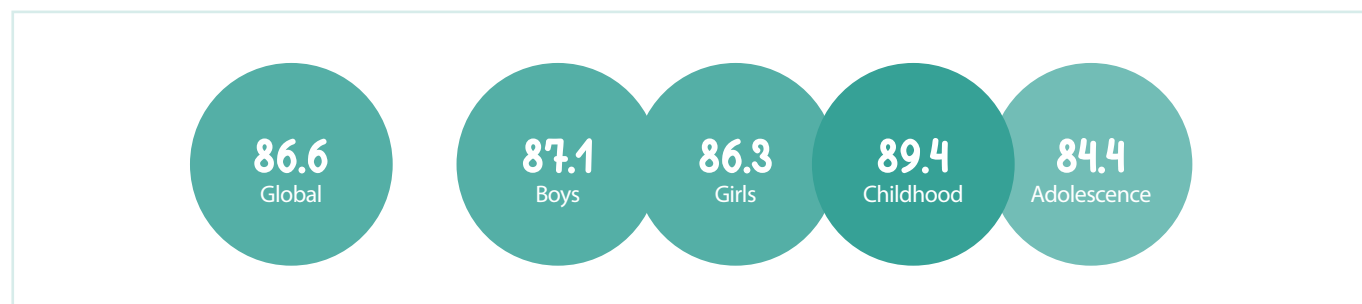


Figure 42 –Average perceived health status, according to sex and life stage.

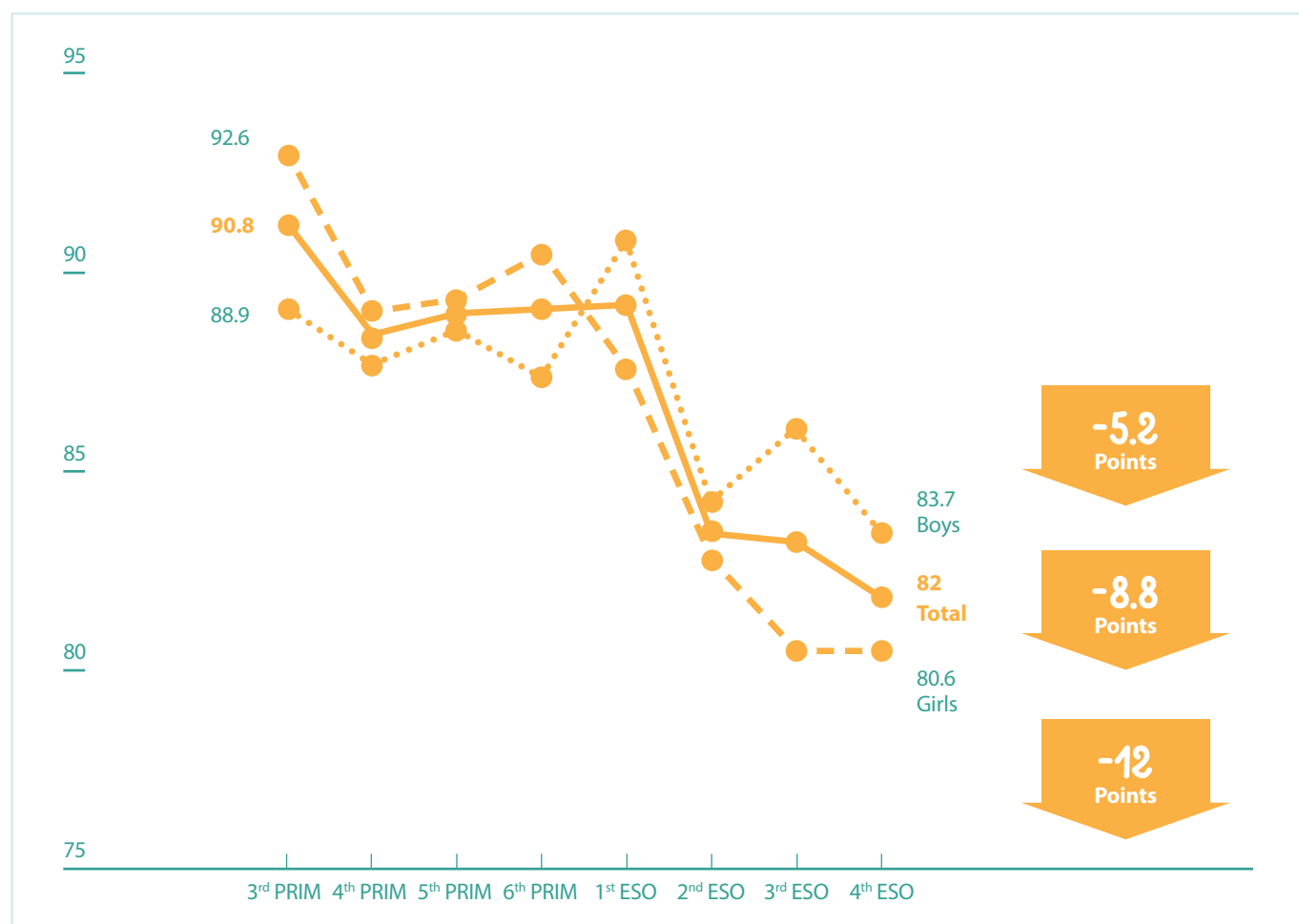
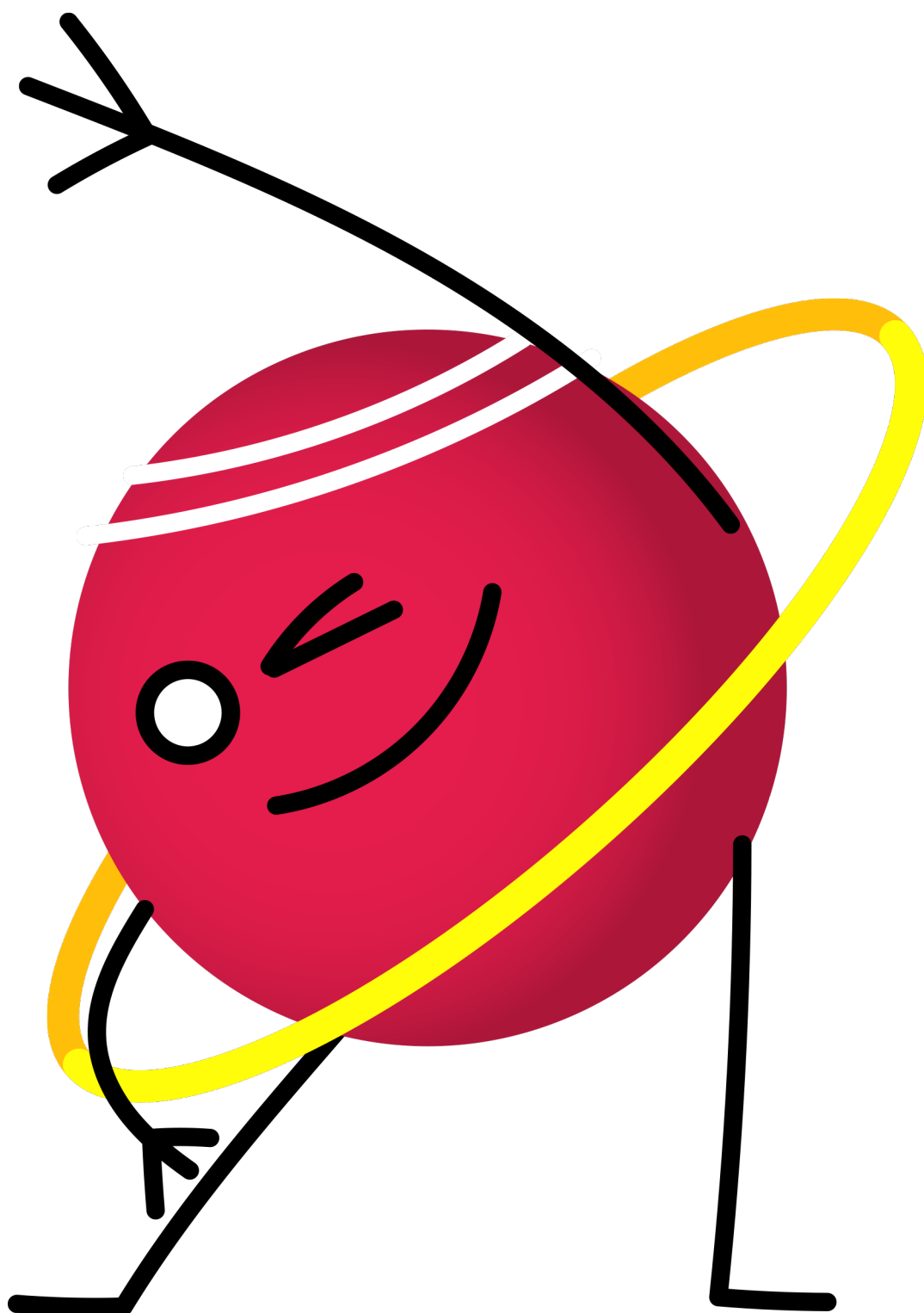


Figure 43 –Average perceived health status, according to sex and academic year.



# REQUESTS AND NEXT STEPS

**It is very important to guarantee an adequate development of Spanish children and teenagers. Preventive policies and interventions must protect healthy lifestyles, and research must lead the way in promoting health.**

# 17 RECOMMENDATIONS DERIVED FROM THE PASOS 2019 STUDY

The situation identified with the PASOS 2019 study highlights the need to start acting now to ensure that children can grow up in a safe and healthy environment that allows them to reach their full potential. For this reason, the Gasol Foundation calls on public institutions, the private sector, civil society and the third sector to place prevention of childhood obesity at the centre of the political and social agenda, by implementing these ten measures:

- 1 Invest in policies for prevention of childhood obesity** that manage to slow the deterioration of habits that takes place throughout childhood and adolescence, as evidenced by this study.
- 2 Implement multilevel, multi-component community-based interventions** that promote health and are capable of involving all the key sectors in which children develop: kindergartens, primary and secondary schools; health centres; sport centres; leisure centres; city governments; and local businesses, among others. We are facing a complex epidemic that requires complex responses.
- Ensure that policies on **reducing child poverty** incorporate the component of **promoting healthy lifestyles**. Ensure also that public health policies and interventions focused on preventing and treating childhood obesity incorporate a sensitive, clear-eyed view of social inequalities.
- 4 Increase the hours and quality of physical education by providing more resources and support to teachers and schools.** At the same time, the National Sports Council, together with the autonomous regions and municipalities, reinforce initiatives that promote physical activity and sports outside the school environment.
- Incorporate the **promotion of hours of sleep and the quality of rest** in interventions that prevent childhood obesity and promote healthy lifestyles.
- Ensure that children grow up in an environment that allows them to achieve a **high level of adherence to the Mediterranean diet**. For this, it is necessary to inform and raise awareness among families, and food producers and suppliers in order to build healthy and fair eating environments. Marketing and advertising aimed at children regarding food products that are detrimental to diet quality should be regulated and limited.
- 7 Guarantee the rights of children throughout their development to adulthood, especially protecting their emotional well-being and ensuring a high level of quality of life.**
- 8 Support research on obesity and children's health** as a tool to generate knowledge to efficiently approach the epidemic.
- 9 Provide professionals who deal with child and teenage development with enhanced training on childhood obesity,** its determinants, and how to teach healthy lifestyle habits.
- 10 Promote and fund the National Plan against Childhood Obesity, led by the Ministry of Health, Consumer Affairs and Social Welfare,** involving all state, regional and local public administrations and other entities related to this matter.

With the publication of the results of the PASOS study, the Gasol Foundation aims to significantly contribute to achieving these recommendations, with the ultimate goal of improving the health of children and teenagers in Spain.



## 18 NEXT STEPS

- **Consolidate the consortium** created in the framework of the PASOS 2019 study. A very robust network of research groups, public and private institutions, schools, families and children and teenagers has been created and should be reinforced. It is a network in which many hours, effort and enthusiasm have been invested and is generating and will continue to generate important evidence on the childhood obesity epidemic and its determining factors.
- One of the first steps that the research group consortium is already undertaking is the **publication of scientific articles and the dissemination of the main results** in documents such as this report or in conferences and workshops. In the coming months, we estimate publishing numerous articles in important journals in the fields of public health, paediatrics, physical activity, sleep or nutrition.
- There should be further **analysis of how the lifestyle factors recorded by the PASOS 2019 study link to childhood obesity rates** and also of interactions between those factors. A more in-depth analysis is needed on the self-reported lifestyle factors from the parents of the participating children; these results are not presented in this report.
- The scientific coordination committee comprised by the Gasol Foundation and the IMIM is expanding the network of collaboration with research groups that can contribute to finding **indicators of the environment** in which the children and teenagers that participated in the PASOS study develop. This will allow for a deeper interpretation and discussion of the association between lifestyle factors and the childhood obesity epidemic.
- The PASOS 2019 study is a cross-sectional study and, as such, only collects data at a specific point in time. For this reason, it is impossible to establish causality between the aspects analysed and determine whether the deterioration of certain aspects causes the deterioration of others or vice versa. In order to establish this type of association and to study causality in depth between certain factors and overweight and obesity in children, **longitudinal (cohort) studies** should be carried out. In this sense, PASOS 2019 offers a **huge opportunity** to build a representative cohort of Spanish children and teenagers to accumulate important scientific evidence in the coming years regarding the causes of childhood obesity.
- The results of the PASOS study allow us to alert about the current situation regarding the childhood obesity epidemic in Spain and its main lifestyle determining factors. In light of these main results, there is a need to implement **prevention initiatives, promote healthy lifestyle habits, and adopt effective treatment strategies** to tackle the alarming situation that has been efficiently identified.

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