

## Protocolo

## SESSAMO, follow-up of secondary students to assess mental health and obesity: a cohort study



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## ABSTRACT

During last decades, a departure from health-related lifestyles has been observed among adolescents. Evidence reports that healthy lifestyles could be predictors of better mental health status. The aims of the SESSAMO Project are: 1) to assess the association between lifestyles and physical and mental health; 2) to assess how self-concept and stressful life events can modulate these associations; and 3) to establish the role of social determinants in the lifestyle and in adolescents' health. The SESSAMO Project is a prospective cohort carried out in Spain. Students aged 14–16 years (2nd–4th ESO) and their parents are invited to participate. Baseline data are collected through on-line, validated, self-administered questionnaires through a digital platform. Information on lifestyles, stressful life events and self-concept are collected. Screening of depression, anxiety, eating disorders, suicide risk, psychotic experiences and COVID impact is assessed. Every three years, up to age of 25, participants will be contacted again to update relevant information.

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## SESSAMO, seguimiento de estudiantes de secundaria para valorar salud mental y obesidad: estudio de cohortes

## RESUMEN

En las últimas décadas se ha producido un alejamiento de los estilos de vida saludables en adolescentes. Los hábitos saludables pueden predecir una mejor salud mental. El proyecto SESSAMO tiene como objetivos: 1) determinar la asociación entre el estilo de vida y la salud física y mental; 2) determinar cómo el autoconcepto y los acontecimientos vitales estresantes pueden modular dichas asociaciones; y 3) establecer el papel de los determinantes sociales en el estilo de vida y en la salud de los adolescentes. Se trata de un estudio de cohortes prospectivo, dirigido a estudiantes de secundaria de 14–16 años y a sus padres. Los datos basales se recogen con cuestionarios validados y autoadministrados en una plataforma *on-line*. Se realiza un cribado de depresión, ansiedad, trastornos alimentarios, riesgo de suicidio, experiencias psicóticas e impacto de la COVID-19. Cada 3 años, hasta la edad de 25 años, se les volverá a contactar para actualizar la información relevante.

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## Palabras clave:

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## Introduction

Adolescence is a transition period characterized by changes in physical, cognitive, emotional, and social features making this period a crucial and critical stage in adolescents' development.

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At this stage, behavior and lifestyles development patterns might affect the future health and well-being of youths. In recent decades healthy lifestyles in this age period have been abandoned. Moreover, much evidence has been established reporting that these healthy lifestyles could be strong predictors of better mental health status among adolescents.<sup>1</sup>

Spain tops the ranking of childhood obesity prevalence in the European Union. Childhood obesity is closely related to free time exposure to screens.<sup>2</sup> A consistent association between sedentarism or screens use and poor mental health has been observed.<sup>3</sup> This fact is important when one third of our adolescents spends more than 3 hours per day connected to social networks.<sup>4</sup> Excessive use of social networks or watching television, insufficient physical activity level or inadequate sleeping patterns are considered risk factors for psychopathology development.<sup>5</sup> Concerning toxic consumption, according to the ESTUDES Survey (*Spanish National survey on drug use in Secondary Education*), more than 50% of adolescents aged 14-18 years report binge drinking in the last 12 months and one in every four-last month. Several studies have demonstrated that the use of cannabis during adolescence increases the risk of psychosis and schizophrenia accompanied by genetic factors, among others.<sup>6</sup> On the other hand, adverse life events during childhood, especially adult abuse and bullying by peers<sup>7</sup> are important predictors of impaired social development and mental disorder.<sup>8</sup>

In Spain, suicide is the first cause of death between 15 and 24 years.<sup>9</sup> Non-suicidal self-harm, beginning between 11-15 years of age and present in 13-23% of the general population, is an indicator of emotional dysregulation and an important risk factor for suicide attempts.<sup>10</sup>

In Spain, no cohort studies have been carried out in the adolescent population with the objective to ascertain the relationship between lifestyles and psychosocial factors and risk of physical illnesses and mental disorders. Given the priority to carry out specific preventive efforts and public health policies in this crucial transition period, it is essential to describe the prevalence of healthy and risk behaviors, as well as psychiatric symptoms, and to establish possible associations between the prevalence of these behaviors and the risk of developing physical and mental disorders. This is the main objective of the SESSAMO cohort study. This project aims to: 1) assess the association between lifestyle and physical and mental health; 2) assess to in which extent self-concept and stressful life events can modulate these associations; and 3) establish the role of social determinants both in the lifestyle and in adolescents' health.

## Method

### Design

SESSAMO Project (*Seguimiento de Estudiantes de Secundaria para valorar Salud Mental y Obesidad* [Follow-up of secondary students to assess mental health and obesity]) is a multicentric prospective cohort study developed in Spain. The collection of baseline data of the participants is carried out at schools through on-line, validated, self-administered questionnaires included in a data collection platform specifically designed for this project. Starting at 14, every three years, up to the age of 25, participants will be contacted again through a mobile application to update their information. The follow-up questionnaires will include questions regarding habits and changes in lifestyle and psychosocial or physical variables, and new medical or psychiatric diagnoses.

### Participants

All public, concerted and private upper schools from Canary Islands, Navarre and the Basque Country participate in the study. After schools' acceptance to participate, all the students aged from 14 to 16 years (from 2nd to 4th of ESO - grades 2 through 4) and their parents or legal guardians are invited to take part of the study. We estimate a final sample of 4000 participants. Exclusion criteria are: the non-participation of the school center, poor knowledge of the two languages in which the study is developed: Spanish or Basque language; the non-participation acceptance by parents or legal guardians; the non-participation assent by the student despite the consent of the parents or guardians; and students with cognitive or visual impairment.

### Tools and materials for data collection

Baseline information is collected through on-line, validated, self-administered questionnaires included in a data collection platform specifically designed for this project (Table 1). Variables related to lifestyles, stressful events, personality and mental health are collected. The Oviedo Response Infrequency Scale<sup>11</sup> is included to detect random responses.

After parents or legal guardians fulfill the informed consents, adolescent' height and weight are measured. Likewise, by means of another specific informed consent, the technician collects an oral sample obtained rubbing a specific collector for genetic determinations (ORACollet DNA OCR-100 Kit), non-invasive technique and without health risk. These samples are kept in a biobank until analysis and will be destroyed once the project has finished.

SESSAMO includes an optical questionnaire for parents inquiring about several physical and mental diseases and health conditions of their children. COVID-19 impact is included. This questionnaire is completed in paper format and only at baseline.

### Statistical analyses

The association between lifestyle variables and the presence of stressful life events and the prevalence or incidence of physical and mental pathology will be carried out through logistic regression models. Cox regression models will be used for longitudinal analysis with more than 2 years of follow-up. Likewise, in the case that the different mental health indicators are collected quantitatively generalized linear models or generalized estimation equation models will be applied. In all cases, the models will be adjusted for possible confounding variables. The possible interaction between personality traits or the presence of stressful events and different lifestyles in their effect on mental health will be analyzed including interaction terms in the regression models.

### Confidentiality and ethical aspects

The Research Ethics Committees at each Spanish autonomous community implicated in the project approved the protocol. All participants and their parents or legal guardians receive a study information sheet and a graphical summary of the protocol (see online Appendix A), as well as individual informed consents. Together with the consent of the parents/legal guardians, the assent of the minor is included.

Data storage is carried out in two independent databases. One of them contains participants' identification data and the other clinical conditions. The use of independent databases guarantees the confidentiality of the data.

All information is treated in a completely confidential manner and is used exclusively for research purposes, according to the

**Table 1**  
Baseline assessment: questionnaires included in the digital platform.

Variables	Instruments of measurement
<i>Lifestyle and health</i>	
Diet	Food Frequency Questionnaire (FFQ) <sup>12</sup>
Physical activity	Physical Activity Questionnaire for Adolescents (PAQ-A) <sup>13</sup>
Hobbies	Questions from ESTUDES <sup>14</sup>
Toxic habits	Questions from ESTUDES <sup>14</sup>
Sleep quality	Pittsburgh Sleep Quality Index (PSQI) <sup>15</sup>
Sexual behavior	Questions from the 2019 Middle School Youth Risk Behavior Survey
Videogames	Game Addiction Scale for Adolescents (GASA-Short) <sup>16</sup>
Internet problematic use	Problematic Internet Use Scale in adolescents (PIUS-a) <sup>17</sup>
<i>Stressful events</i>	
Bullying and cyberbullying	Olweus Bully Victim Questionnaire (OBVQ) <sup>18</sup>
Stressful life events	Stressful Life Events Inventory <sup>19</sup>
Adverse experiences	Inventory of Adverse Childhood Experiences (IACE) <sup>20</sup>
<i>Personality variables</i>	
Self-concept	Self-concept Form 5 (AF-5) <sup>21</sup>
<i>Mental health</i>	
Strengths and Difficulties	Strengths and Difficulties Questionnaire (SDQ) <sup>22</sup>
Depression, Anxiety and Stress	Depression, Anxiety and Stress Scale (DASS-21) <sup>23</sup>
Suicide risk	Columbia-Suicide Severity Rating Scale (C-SSRS) <sup>24</sup>
Self-Injurious	Self-Injurious Thoughts and Behaviors Interview (SITBI) <sup>25</sup>
Eating disorder	Children's Eating Attitudes Test (ChEAT) <sup>26</sup>
Psychotic experiences	Prodromal Questionnaire-Brief (PQ-B) <sup>27</sup>
COVID-19 impact	UCLA Brief COVID-19 Screen for Child/Adolescent PTSD <sup>28</sup>

Spanish Organic Law 15/1999 on data protection and Law 3/2018 on data protection and guarantee of digital rights (LOPD).

## Discussion

SESSAMO Project is the first Spanish study whose aim is to prospectively assess the association between lifestyle and social determinants with physical and mental health in adolescents. Data from SESSAMO will permit to ascertain adolescents' lifestyle and the main health problems associated to them. To establish the role that these lifestyles have on adolescents' health is essential to design and implement preventive actions to change these habits and improve first adolescents' and later adults' physical and mental health.

Due to the importance of early intervention in the development of possible psychopathologies, the research team informs the parents or guardians if a suspicious case of mental disorder is detected. Finally, each participating school receives a global results report. This information will make it easier for schools to develop lines of action and implementation of specific programs that address issues such as emotional management, suicidal ideation, mental health, and lifestyles, among others. The participation of different Spanish regions and types of schools increases study power and its ability to extrapolate its results.

## Limitations

Although the adolescents will be accompanied by a technician during the baseline evaluation who can resolve their doubts and all the questionnaires used to early detection of mental disorders have been validated in adolescent samples a non-differential misclassification bias cannot be ruled out. In order to avoid a possible bias in answering questionnaires, as quality control analysis, a specific scale has been introduced in the platform to eliminate those participants who report random responses.

Another limitation is that the platform is not accessible to students with visual disabilities.

An important challenge of this study is, firstly, to get the involvement of schools, and secondly family's participation. For that reason, our team is involved in all the process starting with the first

approach to school authorities and counseling departments, and finally getting access to parents' associations and families providing all the information they request.

## Related articles

No other publications containing the results of this study have already been published or submitted to any journal.

## Study status

At the time of this submission participant recruitment was not completed.

## Editor in charge

Salvador Peiró.

## Authorship contributions

A. Sánchez-Villegas and A. Goñi-Sarriés performed the literature review and conceived and designed the study. G. Pérez, N. Yáñez-Goñi, F. Lahortiga-Ramos, A. Iruin, A. Díez-Suárez, I. Zorrilla, L. Morata-Sampaio, M.J. Oliver and A. González-Pinto designed the data collection tools and will conduct the recruitment and the evaluation of the subjects in the different Spanish regions. A. Sánchez-Villegas and A. Goñi-Sarriés drafted the manuscript. A. Sánchez-Villegas will manage data. All authors have reviewed the manuscript and approved the final version of the protocol.

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### Conflicts of interest

A. Sánchez-Villegas: Instituto de Salud Carlos III, Grant PI20/00133. I. Zorrilla: Otsuka and Janssen conference support. A. González-Pinto: Grants of Cibersam, Spanish Ministry of Science and Basque Government; provided funding, consulting fees and conference support of Janssen, Angelini and Rovi.

### Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.gaceta.2024.102385.

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