

## Protocol

## Factors influencing dietary inequalities among adolescents in Madrid and Bilbao: a qualitative research project



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## ABSTRACT

**Objective:** To describe the design and methodology of a qualitative study to explore the main factors influencing dietary inequalities in adolescents in Madrid and Bilbao, Spain.

**Method:** The study area included six neighborhoods (three in each city) of different socioeconomic status (SES): low, medium, and high. We sampled 12 secondary schools (six in each city: two per socioeconomic level). Our methodology comprised: 1) developing an *ad hoc* index to classify all neighborhoods according to their SES; 2) selecting the study area and sample; 3) conducting semi-structured interviews (n = 36) and focus groups (n = 24). Grounded theory and phenomenological analysis will be employed in data analysis. Initially, we found factors influencing in adolescents' diet such as gender, family environment, and SES.

**Conclusions:** Systematizing the selection of neighborhoods and secondary schools, along with using appropriate methods, could serve as a foundation for future studies on health inequalities among adolescents.

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## Factores que influyen en las desigualdades alimentarias en Madrid y Bilbao: un proyecto de estudio cualitativo

## RESUMEN

**Objetivo:** Describir el diseño y la metodología de un estudio cualitativo que explora los factores principales que influyen en la desigualdad alimentaria en los adolescentes en Madrid y Bilbao, España.

**Método:** Se seleccionaron seis barrios (tres en cada ciudad) de diferente estatus socioeconómico (ESE): bajo, medio y alto. Obtuvimos una muestra de 12 institutos (seis en cada ciudad y dos por nivel socioeconómico). La metodología consistió en: 1) desarrollo de un índice *ad hoc* para clasificar los barrios según su ESE; 2) selección de las áreas de estudio y de institutos; 3) realización de entrevistas semiestructuradas (n = 36) y grupos de discusión (n = 24). En el análisis se utilizarán la teoría fundamentada y el análisis fenomenológico. Inicialmente, encontramos factores que influyen en la alimentación de los adolescentes, como el género, el entorno familiar y el ESE.

**Conclusiones:** La sistematización en la selección de barrios e institutos, y la utilización de metodología adecuada, pueden servir como base para futuros estudios sobre las desigualdades de salud en adolescentes.

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## Palabras clave:

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## Introduction

Explaining and disseminating the study design is necessary to show a kind of guide that is useful to other researchers who want to

analyze diet inequalities in adolescents in secondary schools. In the case of the qualitative methodology, this type of disseminating is much less frequent than quantitative methodology. For this reason, we think in the pertinence of our proposal.

The theoretical frameworks guiding this project include Rasmussen's<sup>1</sup> conceptual framework, the Angelo framework, and the typology of environments proposed by Swinburn et al.<sup>2</sup> These conceptual frameworks encompass four relevant dimensions

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—cultural,<sup>3</sup> physical,<sup>4</sup> social,<sup>5,6</sup> and individual<sup>7,8</sup>— as influences on diet.

The objective of this article is to describe the design and qualitative methods employed in the Dietary Inequalities and Behaviors in Adolescents project (PID2020-113537RB-I00) within this framework.

## Method

The qualitative case study methods used herein follow the interpretative/constructivist paradigm to seek out multiple perspectives.<sup>9</sup> The interpretative/constructivist paradigm consists of a case study design combined with grounded theory analysis method that allow the in-depth exploration of factors of diet within context and the generation of a theoretical framework or complementing the consolidated theory.<sup>9</sup>

The project was funded by the Spanish Ministry of Science and Innovation in 2021 and is being conducted in Madrid and Bilbao through 2024. We chose these two cities because they implied two differentiated dynamics: Madrid could represent a large European city, and Bilbao a medium-sized city. These cities were known by the research group and the members of the project had conducted qualitative researches related to health inequality<sup>10,11</sup>. One of these researches used very similar criteria to those of the research of this manuscript<sup>10</sup>.

## Sampling methods

### Neighborhood sampling

Madrid, a municipality with a population of just over three million, is administratively organized into 21 districts and 131 neighborhoods. Bilbao, with a registered population of almost 350,000 people, is administratively organized into eight districts and 40 neighborhoods. To sample neighborhoods, we followed several steps:

1. Classification of all the neighborhoods in Madrid ( $n = 131$ ) and Bilbao ( $n = 40$ ) according to their SES. We used indicators related to unemployment, temporary and part-time employment, education level, foreign-born residents, single-headed families, and household income. These data were available on the website of the Local Government of Madrid<sup>12</sup> and Bilbao, from secondary databases.<sup>13</sup>
2. Building the index. We standardized each indicator using Z-scores, which allowed to compare data that have different units of measure or scales; and perform an unweighted linear addition obtaining a score for each neighborhood. Next, we stratified the neighborhoods in Madrid and Bilbao into tertiles. The first tertile includes neighborhoods with a high-SES, the second tertile includes neighborhoods with a medium-SES, and the third tertile includes neighborhoods with low SES. This type of standardizing has been used elsewhere.<sup>10</sup>

First, we preselected 13 neighborhoods according to their SES in Madrid and eight in Bilbao to ensure the enrollment of the maximum number of schools possible. We did this to minimize potential selection biases and refusals to participate in the study.<sup>14</sup> Figure 1 shows the districts in Madrid and Bilbao, the location of the preselected and finally selected neighborhoods, and the selected schools in each city.

Among the 13 neighborhoods preselected in Madrid, five were finally selected for the qualitative study: one for low SES, two for medium SES and two for high SES. Of the eight neighborhoods preselected in Bilbao, five were finally selected for this case study:

two for low SES, two for medium SES, and one for high SES. The five neighborhoods in both cities were selected due to the secondary schools that wanted to participate in the study (convenience sample), ensuring every SES level had representation.

### Sampling school

We first selected at least two secondary schools per neighborhood to be contacted, then included all schools willing to participate in our convenience sample. Next, a professional market research agency contacted all schools and explained the study aims and methods to their principals. These recruited participants in schools, principals according to the required profiles (e.g., teachers). At last, we included 12 secondary schools (six per city).

## Data collection

Data is being gathered through a combination of semi-structured interviews (SSI) and focus groups (FG). These two techniques complement each other and allow us to capture not only individual insights into dietary behaviors during adolescence, but also collective perceptions from social types such as parents, teachers, and adolescents.

First, we conducted 12 SSI with school principals (they were considered key informants) between April and October 2021. We interviewed them to have a comprehensive vision of the school, the neighborhood, and dynamics related to dietary behaviors among adolescents.

Next, we conducted three SSI with students aged 15 through 18 years in each city ( $n = 6$ ) as a kind of pilot study in each city between April and May 2021. Based on these first six SSI, we refined the topic guide for both SSIs and FG.

Both the SSI and FG involving adolescents have been designed according to specific profiles determined by the following criteria: type of educational center (public or private), sex, age, school year, immigration, and ethnic group.

Fieldwork started in April 2022 and will last until December 2023. To date, we have conducted 32 SSI and 12 FG (73 participants). The FG comprise between five and eight participants. These are taking place in the chosen schools. The SSI are lasting between 30 and 45 minutes and FGs between 60 and 90 minutes. The SSI and FG are coordinated by researchers coauthoring this research.

We developed a common guide for the SSI and FG, with slight variations depending on the target group (adolescents, parents, or teachers). The guide included topics such as: sociodemographic data (age, course that is studied; family environment, family composition and academic level of parents); characteristics of neighborhood and school; uses and resources of neighborhood; dietary behaviors (daily diet, week-end diet, family diet, diet in breakfast, lunch, and dinner); peer group influence; network influence; type of food shops where adolescents buy; physical activity in the school; daily physical activity and perception of environment related to physical activity; influence of the lockdown due to the COVID-19 pandemic in the diet and physical activity. The complete topic guide is included in online supplementary data.

## Analysis

We will use constructivist grounded theory<sup>15</sup> and interpretative phenomenological analysis<sup>16</sup> to analyze the data. Despite the different epistemological tradition of both theories, in the research team there are members who use the grounded theory in their analyzes and others the interpretative phenomenological analysis. We think that the use of both theories (triangulation of qualitative methods)<sup>17</sup> can give a more holistic vision to our project.

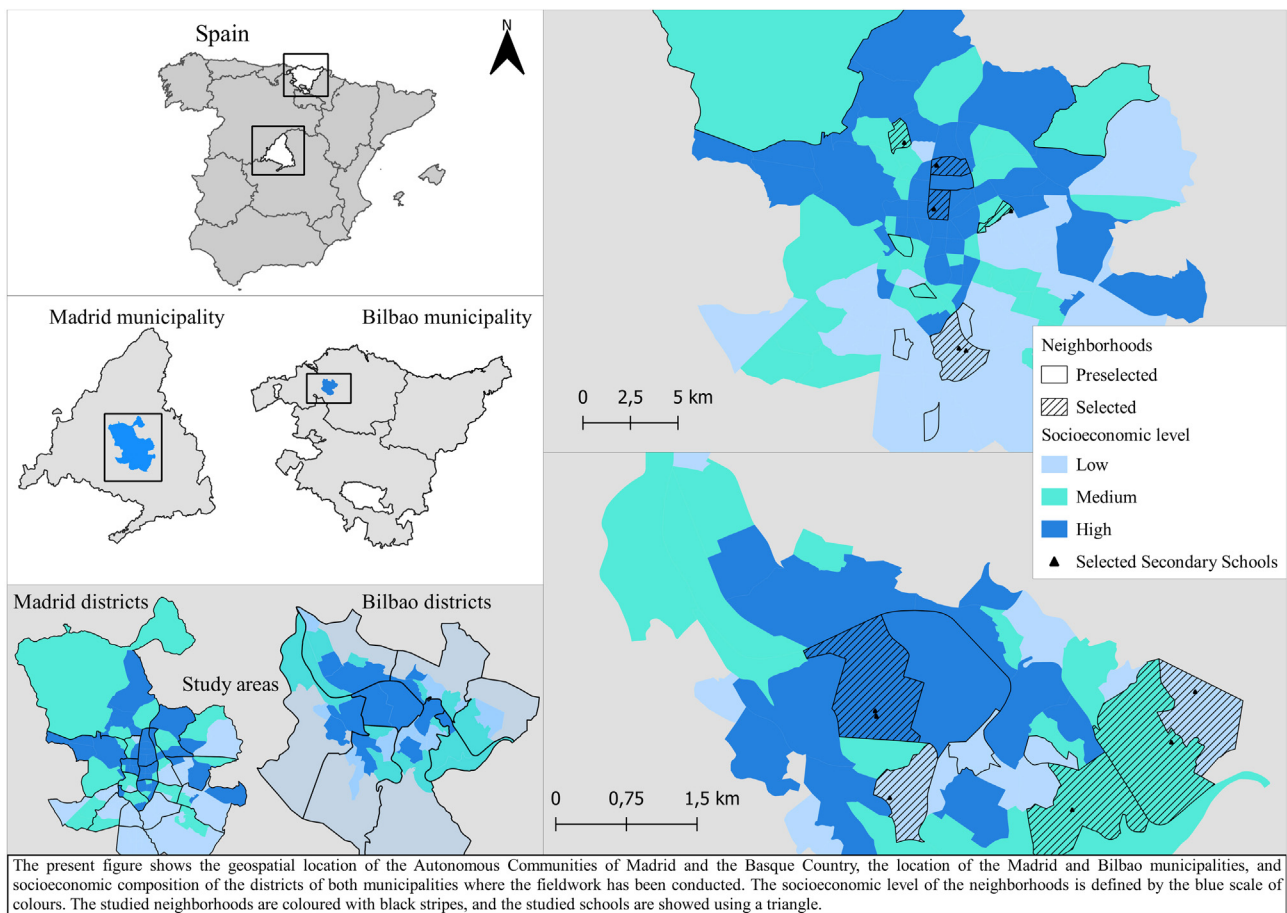


Figure 1. Map of neighbors and schools in Madrid and Bilbao.

**Ethical considerations**

The study is being conducted according to the guidelines laid down by the Declaration of Helsinki and ethical approval was granted by the Ethics Committee of the University of the Basque Country (M10.2021\_315). Anonymity and confidentiality of the participants is guaranteed. We are obtaining written consent for their participation. The inclusion of minors in this study requires an informed consent from the parents.

**Discussion**

We designed a qualitative case study to explore the main factors influencing dietary behaviors in adolescents living in two Spanish cities. In this manuscript, we describe the study protocol.

In the time elapsed since the project began, the authors have detected some factors that influence the diet of adolescents, such as gender, family environment, SES and the use of internet and social media. Related to gender, the scientific literature suggests that there are gender disparities in adolescents' diets, with females tending to adhere to beauty patterns and males to a muscle-building.<sup>18</sup> The family environment is related to SES, thus, the family model and, specially, the lack of supervision are factors influencing dietary behaviors in low socioeconomic level areas.<sup>19</sup> Finally, digital factors may influence also adolescents' eating behaviors. According to several publications, internet, mass media and social media conditioned adolescents' food choices and influenced their self-perception.<sup>20,21</sup>

Other factors such as the influence of peer group<sup>22</sup> and teachers,<sup>23</sup> school environment<sup>24</sup> and neighborhood

environment,<sup>25</sup> will probably be found as we progress in our project.

**Limitations**

Considering we used a convenience sample, we acknowledge that this case study may not be fully representative of the entire cities of Madrid and Bilbao. Refusals from school may have limited our ability to identify "the most useful" discourses. Due to the high demand in schools in Spain for participating in research studies, projects, etc., they reject many of these proposals.<sup>14</sup> In addition, researching within schools presents several challenges, including limited time for FGs, potential bias in selecting interviewees and FG participants, and the lack of neutral spaces to conduct the FGs and SSIs in the schools.<sup>26</sup>

**Conclusion**

We believe that the design and methods of Dietary Inequalities and Behaviors in Adolescents study may improve the research dynamics in health issues in adolescents in educational centers as well as the study of determinants of diet. Therefore, the results of this project might provide valuable evidence for developing food and nutrition policies aimed at improving adolescents' health.

**Editor in charge**

Jorge Marcos Marcos.

## Authorship contributions

J. Rivera made a substantial contribution to the design and elaboration of this manuscript. I.L. González reviewed the first draft of the manuscript and contributed with his important comments to the final version; in addition, designed the map and the table included in the manuscript. G. Ramos contributed with her important comments to the final version. L. Gravina conducted a bibliographical review very important for the writing of this manuscript. J. Díez helped to bibliographical review and to design the map and the table included in the manuscript. Finally, M. Franco contributed with his important comments to the final version.

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## Conflicts of interest

None.

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## Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at [doi:10.1016/j.gaceta.2023.102325](https://doi.org/10.1016/j.gaceta.2023.102325).

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