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Socioeconomic trends in anxiolytic, hypnotic, and sedative use among secondary school students in Spain from 2010 to 2021: a repeated cross-sectional design

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Abstract

Background The increasing use of anxiolytics, hypnotics, and sedatives (AHS) among adolescents is a growing public health concern. Social determinants such as gender or socioeconomic status have a significant influence on consumption levels. However, whether trends in adolescent AHS use show socioeconomic and gender disparities is unknown. The aim of this study is to examine the trends in gender and socioeconomic inequalities in secondary school students' AHS use in Spain from 2010 to 2021.

Methods A repeated cross-sectional analysis was conducted using data from the Survey on Drug Use in Secondary Education in Spain ($n = 192,656$), targeting students aged 14–18 years during 2010–2021. Gender-specific prevalences of AHS use were calculated according to the educational and occupational status of the mother, the father, and both parents. Chi-squared tests assessed statistical significance of the observed social gradients. The Relative Index of Inequality (RII) and Slope Index of Inequality (SII) with 95% confidence intervals were used to measure inequality magnitudes. Consumption trends were examined through prevalence ratios (PR) derived from age-adjusted robust variance Poisson models.

Results Statistically significant social inequalities in AHS use were identified among girls, which increased over time. These inequalities were particularly pronounced when considering maternal educational level (e.g. 2021: 21.5% vs. 16.3%; $R_{2021} = 1.37$ [1.16–1.62]) and paternal occupational status (e.g. 2021: 23.2% vs. 16.5%). Trends showed a significant increase among all groups in both male and female students (e.g. both parents with primary education: $PR_{2021} = 1.74$ [1.23–2.47] and $PR_{2021} = 1.83$ [1.49–2.25], respectively).

Conclusions The findings highlight the necessity for developing equity-focused public health policies addressing adolescent AHS use, especially among disadvantaged female students. Further research is needed to explore the social determinants of adolescent AHS use, considering inequalities from an intersectional perspective.

Keywords Anxiolytics, Hypnotics and sedatives, Adolescent, Socioeconomic status, Gender, Social Inequalities, Trends

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Background

Several recent studies have highlighted an increasing trend in the prevalence of mental distress. Prior to the COVID-19 pandemic, the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) included depression and anxiety, both rated as the most disabling mental disorders, among the 25 leading causes of burden in the world [1]. Over the last couple of years, the data has pointed to a further deterioration in mental health indicators following the SARS-CoV2 health crisis, with higher increases in the diagnosis of anxiety disorder in areas that were most affected by the virus and mobility restrictions [2]. Similarly, numerous studies have indicated significant variation in the consumption of psychotropic drugs, such as anxiolytics and antidepressants, observed across different regions, age groups, and specific drug types [3, 4].

Public concern has particularly focused on the worsening of mental health among children and adolescents [5]. An international meta-analysis on this age group estimated that the prevalence of depressive and anxious symptoms doubled between 2015/16 and 2021 [6]. Likewise, overall psychotropic drug use increased among adolescents in recent years, although the trends vary depending on the type of medication [7, 8]. The use of anxiolytics, hypnotics, and sedatives (AHS) is particularly relevant, as these are some of the most widely consumed psychoactive substances [9], and their early use has been associated with higher dependency and risks of health problems later in life [10]. The 2019 European School Survey Project on Alcohol and Other Drugs (ESPAD), carried out on 15–16-year-olds students across Europe, noted that 8.0% of girls and 5.1% of boys had ever used non-prescription tranquilizers, with a stable trend since 1995 [9]. However, as Steinhausen's review [8] highlights, studies from different European countries are scarce and inconsistent, so describing a clear evolution in adolescent AHS use is difficult.

Scientific evidence also indicates a consistent relationship between adolescent AHS consumption and social determinants like gender, educational level, and family environment [11, 12]. Data have shown that women use more psychotropic drugs than men, even with equal need [13]. These studies suggest that observed differences are significantly influenced by gender-related factors, such as societal roles and power distribution. In a patriarchal and class-based society, material and symbolic-cultural subordination of women often leads to distress that very frequently ends up being addressed by a gender-biased medical model, which has historically pathologized and pharmacologized women disproportionately [14]. Moreover, AHS are the only substances of abuse that show a higher rate of consumption among female adolescents

[15]. Although the relationship between socioeconomic factors and adolescent mental health has been widely validated by international studies [16], data about the relationship with AHS use is scarcer and difficult to harmonize. Studies differ in age groups, time periods, the kind of psychotropic drugs or the socioeconomic axes of inequality considered, such as parental educational level or family income [17, 18]. Nevertheless, they all show qualitatively similar results, as adolescent consumption tends to be higher among those with lower parental socioeconomic status. Furthermore, studies targeting southern European countries report substantial impacts on students' mental health and AHS use linked to the economic crisis of 2008, especially in the most disadvantaged households [19]. However, more research focused on the young and adolescent population is needed.

In the case of Spain, research on AHS use among adolescents and its relationship with social inequalities is of particular interest. On the one hand, the Spanish general population reports high rates of psychotropic drug use, with benzodiazepine use highest among a set of 95 countries and territories [20]. Secondary school students have reported a sustained increase in AHS use in recent years, as found by the Survey on Drug Use in Secondary Education in Spain (ESTUDES), with 13.3% and 26.1% of boys and girls aged 14–18 years reporting having ever used AHS in 2023, respectively [15]. On the other hand, the financial crisis of 2008 and the COVID-19 pandemic had significant effects in Spain [21, 22]. In this sense, several inequality indicators have positioned Spain as one of the most unequal countries in the European Union [23]. The AROPE indicator for people under 16 reached its peak in 2014, with almost 38% of young people at risk of poverty and/or social exclusion, a trend that reversed to 29.9% in 2018 and resumed an upward direction in the following years. Thus, the strong economic and social impacts of the financial crisis and pandemic during the last decades in Spain could have had an impact on the high prevalence and rising trend of adolescent AHS use, which requires an in-depth study.

To this end, we analyse trends in social inequalities in AHS consumption among secondary school students between 2010 and 2021 in Spain, considering disparities over diverse axes of inequality simultaneously, giving gender, parental educational level and occupational status a special focus.

Methods

We conducted a repeated cross-sectional analysis using data from the 2010–2021 waves of six ESTUDES surveys, comprising students between ages of 14 and 18 enrolled in secondary schools in Spain (192,656 participants). We used the latest waves with available

microdata for analysis. The survey is conducted by the Government Delegation for the National Plan on Drugs of Spain (DGPNSD) and collects national representative information on the levels and trends in several drug use and other addictions since 1994 on a biennial basis. The self-administered, standardized, and anonymous questionnaires were distributed in various educational centers and classrooms selected by a randomized two-stage cluster sampling. Surveys were conducted within a given academic year, during the following periods: from November to April (for ESTUDES 2010, 2014, and 2016) and from February to May (for ESTUDES 2012, 2018, and 2021). More detailed information on sampling and data collection is described elsewhere [15]. Due to the use of fully anonymized secondary data, absence of direct interaction with participants, and compliance with data protection regulations, our study was exempt from an ethical review.

We analysed the consumption (with and/or without prescription) of any AHS in the previous year, categorized as a dichotomous variable (“Yes”/“No”). The explanatory variables included sex (“Male”/“Female”), age (14–18 years old), year (2010–2021), the highest educational level attained by the mother or father (“Primary school or lower”, “Secondary school” and “Higher education”) and both parents (“Both primary education”, “Only one with secondary education”, “Only one with higher education” and “Both with higher education”), and the occupational status of the mother or father (“Employed”/“Unemployed or other”), and both parents (“Both unemployed or other”, “Only one employed” and “Both employed”). To analyse occupational status, those who reported that their parents had paid employment were considered as “Employed”, while the “Unemployed or other” consisted of those who were unemployed, pensioners/retired, or homemakers.

We calculated prevalences of AHS use separately for each wave, stratified by sex and the educational level and employment status of the mother, father, and both parents. We estimated differences in AHS use prevalences between socioeconomic groups using chi-square tests for male and female students. We calculated the Relative Index of Inequality (RII) and the Slope Index of Inequality (SII) to assess the magnitude of the socioeconomic gradient, in relative and absolute terms respectively. These indices assume a linear association between socioeconomic status and the outcome variable; thus, after testing this condition, estimates were limited to educational level. RII and SII consider the different distribution of the population across educational levels and its changes over time, which is important in southern European countries like Spain, which experienced large educational expansions over parent generations.

To calculate these indicators, individuals were assigned a value between 0 and 1, representing the relative position of their parents’ educational level in the social hierarchy, and this value was related to AHS consumption, using a multiplicative robust variance Poisson model for RII and additive binary logistic regression for SII. The resulting age-adjusted RII can be interpreted as the prevalence ratio between adolescents with parents of the lowest educational level compared with those with the highest, while the SII represents the absolute difference in prevalence across the whole distribution of educational levels.

We assessed trends in the use of AHS using prevalence ratios (PR) calculated from age-adjusted robust variance Poisson models, using time as an independent variable (ref. 2010). We estimated models separately for each parent’s educational and occupational level and by sex. Based on the descriptive results, the PRs of the variables with the greatest impact were graphically displayed to make the result more easily readable. The full set of results, which show similar patterns, can be found in the appendix. We consider results with p-values below 0.05 to be significant. All exercises were executed with the IBM SPSS Statistics 26 package.

Results

As shown in Table 1, our sample is almost equally distributed among female and male students (50.3% and 49.7% of students, respectively), as well as over age, except for students aged 14 and 18, who are less represented. The most frequently reported level of both maternal and paternal educational level is secondary education, followed by higher education. Looking at parental employment status, the proportion of students with a mother in paid employment is lower than that of fathers (64.3% vs. 79.6%). Students with both parents in paid employment account for the majority (54.1%). Last, the table shows that AHS consumption is higher in girls and increased for both girls and boys during the study period.

Regarding socioeconomic inequalities in the time trends of AHS use, we observe important differences in consumption trends for girls and for boys throughout the study period (Figs. 1 and 2). Consumption by parents’ educational level (Fig. 1) does not show a clear trend among boys. On the contrary, AHS use among girls reveals a significant and increasing educational gradient starting from 2016. Since then, lower parental educational levels have been associated with higher consumption. The gradient is especially pronounced according to maternal education (e.g. 2021: 21.5% vs. 16.3% for maternal education and 19.7% vs. 16.7% for paternal education, for primary and higher education respectively) and to both parents’ educational level (e.g. 2021: 22.5% vs. 16.1%). According to the analysis of RII

Table 1 Sample distribution and prevalence of AHS use, with *p*-values for chi-square test by sex

	Total		Male		Female		<i>p</i> -valor
	N (192.656)	%	N (95.786)	%(49.7)	N (96.870)	%(50.3)	
Age							
14	37.498	19.5	18.377	19.2	19.121	19.7	
15	45.185	23.5	22.426	23.4	22.759	23.5	
16	49.482	25.7	24.308	25.4	25.174	26.0	<.001
17	44.445	23.1	22.088	23.1	22.358	23.1	
18	16.045	8.3	8.587	9.0	7.458	7.7	
Years							
2010	31.967	16.6	15.595	16.3	16.372	16.9	
2012	27.503	14.3	13.879	14.5	13.624	14.1	
2014	37.486	19.5	18.505	19.3	18.981	19.6	
2016	35.369	18.4	17.880	18.7	17.489	18.1	<0.001
2018	38.010	19.7	18.579	19.4	19.431	20.1	
2021	22.321	11.6	11.348	11.8	10.973	11.3	
Maternal educational level							
Primary school or lower	29.354	15.2	12.941	13.5	16.413	16.9	
Secondary school	77.458	40.2	37.882	39.5	39.576	40.9	<0.001
Higher studies	54.339	28.2	27.446	28.7	26.893	27.8	
Missing	31.505	16.4	17.517	18.3	13.988	14.4	
Paternal educational level							
Primary school or lower	30.691	15.9	14.024	14.6	16.667	17.2	
Secondary school	74.275	38.6	36.938	38.6	37.337	38.5	<0.001
Higher studies	46.807	24.3	23.910	25.0	22.897	23.6	
Missing	40.883	21.2	20.914	21.8	19.969	20.6	
Parental educational level							
Both primary school	17.285	9.0	7.623	8.0	9.662	10.0	
Only one secondary school	66.678	34.6	32.641	34.1	34.037	35.1	<0.001
Only one higher education	30.620	15.9	15.362	16.0	15.257	15.7	
Both higher education	32.251	16.7	16.460	17.2	15.791	16.3	
Missing	45.822	23.8	23.700	24.7	22.123	22.8	
Maternal occupational status							
Unemployed or others	61.256	31.8	30.025	31.3	31.231	32.2	
Employed	123.881	64.3	61.636	64.3	62.245	64.3	<0.01
Missing	7.519	3.9	4.125	4.3	3.394	3.5	
Paternal occupational status							
Unemployed or others	23.738	12.3	11.392	11.9	12.346	12.7	<0.001
Employed	153.430	79.6	76.848	80.2	76.582	79.1	
Missing	15.488	8.0	7.546	7.9	7.942	8.2	
Parental occupational status							
Both unemployed or others	7.009	3.6	3.264	3.4	3.744	3.9	<0.001
Only one employed	58.747	30.5	28.982	30.3	29.766	30.7	
Both employed	104.279	54.1	52.397	54.7	51.882	53.6	
Missing	22.621	11.7	11.143	11.6	11.478	11.8	
Last year's AHS consumption							
	Prevalence (%)						
2010	9.6		7.1		12.0		
2012	11.6		8.4		14.9		
2014	10.8		7.7		13.8		<0.001
2016	11.6		8.8		14.4		
2018	12.5		9.8		15.1		
2021	13.6		9.7		17.6		

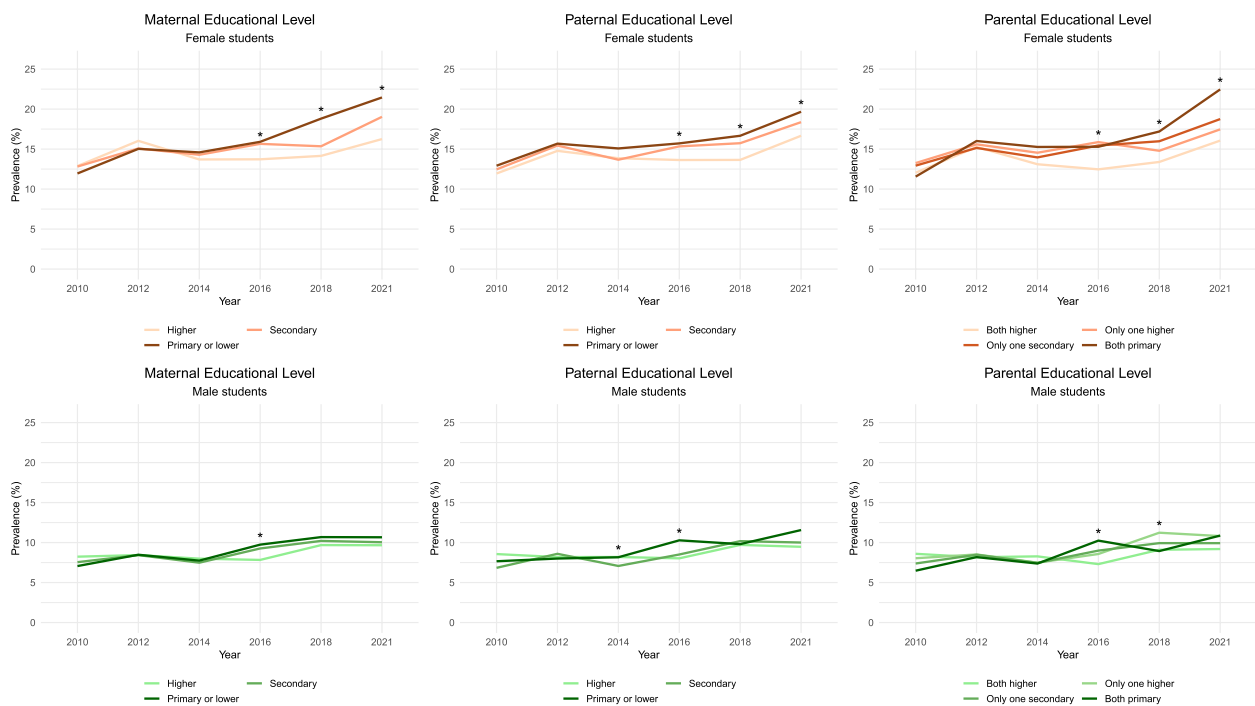


Fig. 1 Prevalences (%) of AHS use in the last year for female students (orange) and male students (green) aged 14–18 according to maternal, paternal and parental educational level in 2010–2021, and chi-square test results^a between educational levels. Spain. ^a p -value < 0.05 = (*)

and SII in Table 2, while no clear inequalities in consumption by mother's educational level are apparent for boys over the period, the social gradient is clear and significant in female adolescents since 2016 (RII₂₀₁₆=1.18 [1.02–1.37]; SII₂₀₁₆=2.55 [0.26–4.84]) and increasing until 2021 (RII₂₀₂₁=1.37 [1.16–1.62]; SII₂₀₂₁=5.50 [2.53–8.48]). Similar increasing inequalities are perceived since 2018 according to paternal and both parents' education, only among female students (RII₂₀₂₁=1.21 [1.02–1.45] and RII₂₀₂₁=1.29 [1.09–1.53], respectively).

Regarding parental employment status (Fig. 2), the prevalence of AHS use shows a clear unequal pattern among female students according to their fathers' situation. Indeed, their consumption is significantly higher throughout the series when fathers were not employed (e.g. 2021: 23.2% vs. 16.5% when fathers are unemployed or employed, respectively). Having both parents unemployed, however, is associated with higher prevalence of consumption significantly in 2014 and 2021 both in boys (e.g. 2021: 12.0% vs. 8.9% when both parents are unemployed or employed, respectively) and girls (e.g. 2021: 22.6% vs. 15.9%). Results also indicate similar prevalences when either or both parents are working. Data of all prevalences shown in Figs. 1 and 2 is included in Tables A1 and A2 in Appendix A.

Taking the year 2010 as a reference time point, Fig. 3 shows the key changes in consumption according to

both socioeconomic variables. The results on consumption according to maternal educational level show a substantial and statistically significant increase for male and female students with lower educated mothers (e.g. maternal primary education: PR₂₀₂₁=1.54 [1.20–1.99] and PR₂₀₂₁=1.70 [1.46–1.98] for boys and girls, respectively). Inequalities emerge in both boys and girls from 2016 onwards. The same unequal pattern is seen when considering both parents' educational levels (both primary education: PR₂₀₂₁=1.74 [1.23–2.47] and PR₂₀₂₁=1.83 [1.49–2.25] for boys and girls, respectively). Regarding occupational status, the probability of consumption increased significantly in all occupational categories compared to 2010, although a considerable rise between 2018 and 2021 is shown in female students with unemployed fathers (paternal occupational status: PR₂₀₁₈=1.25 [1.08–1.46] and PR₂₀₂₁=1.72 [1.46–2.02]). The detailed results of the models on which Fig. 3 is based, as well as the ones for paternal education and maternal and parental occupation, are shown in Table A3 and A4 in Appendix A.

Discussion

As far as we know, this is the first study to examine how social inequalities in secondary school students' AHS use have changed over time in a Southern European context, considering gender together with parental educational

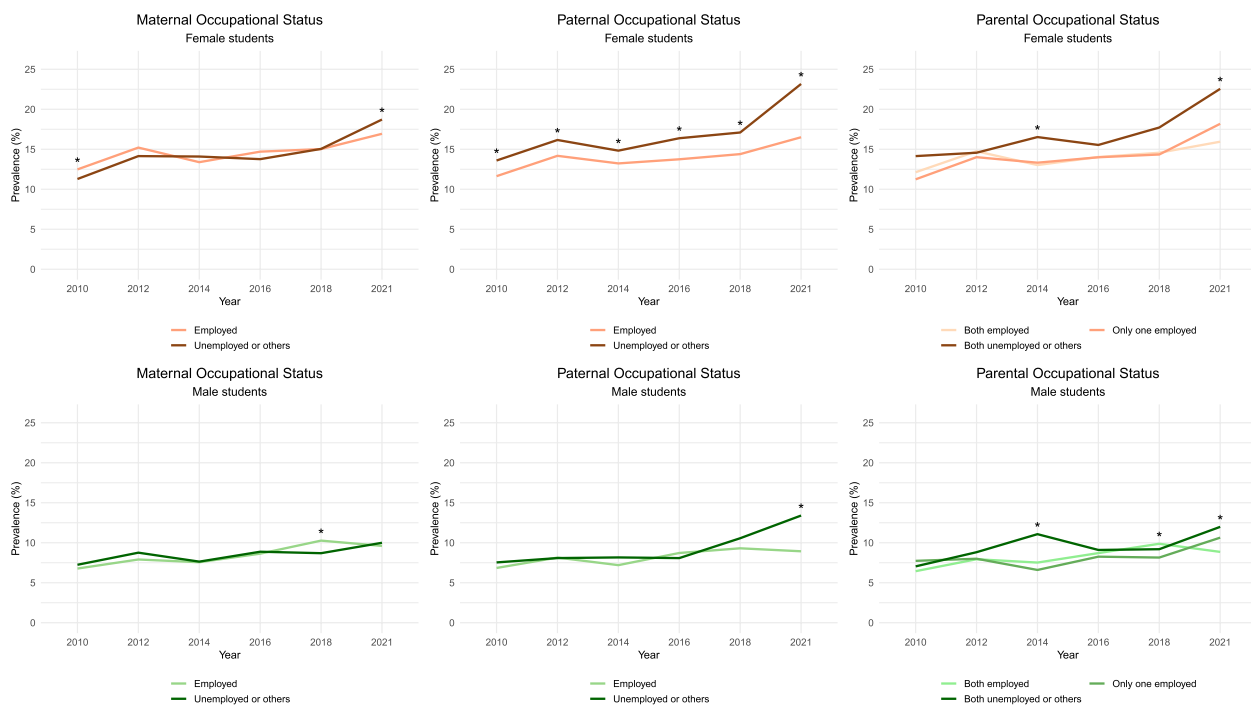


Fig. 2 Prevalences (%) of AHS use in the last year for female students (orange) and male students (green) aged 14–18 according to maternal, paternal and parental occupational status in 2010–2021, and chi-square test results^a between occupational statuses. Spain. ^a p -values < 0.05 = (*)

level or occupational status. Our study shows that consumption and social inequalities in consumption have increased in the last decade, especially among female students. We found a clear social gradient according to parental educational level in girls' AHS consumption, with greater differences by mother's education. These inequalities were evident from 2016 and increased until reaching a 37% difference in the probability of consumption in 2021. We also observed a clear gradient in AHS use depending on paternal occupational status, only among girls. The combined occupational status of both parents affected the consumption of both boys and girls. In addition, the consumption trend for all studied categories showed a significant increase over the study period. These reported inequalities may even underestimate actual disparities among the entire adolescent population. In Spain, education is compulsory until age 16, so the survey does not include those 17 and 18-year-old adolescents who have left school. Evidence suggests that school dropout is linked to adolescents with greater social disadvantage and poorer mental health [24, 25]. Appendix B presents the study results disaggregated by age groups corresponding to school cycles. These analyses show social inequality patterns that, while more diffuse, remain consistent across both age groups, suggesting that inequalities persist and may intensify during late adolescence.

Despite great variability in research design, most studies point, as we do, to an increase in AHS consumption among students during the last decades. Events such as the economic crisis starting in 2008 may have worsened the mental health of students [26], although the results on the effect on psychotropic drug use in the adolescent population are limited [19]. Recent studies have shown a clear rise in psychotropic drug use during the COVID-19 crisis [4], as well as significant increase in diagnoses of anxiety and depression among women and younger adolescents [2]. AHS use should be understood within a broader context of medicalization of daily life [27]. In this process, various forms of discomfort—such as feelings of vulnerability or uncertainty—have been integrated into medical discourse or practice. Consequently, many of these experiences are managed through a pharmacological lens, not only by means of formal medical prescriptions but also through alternative ways of accessing psychotropic drugs. This trend individualizes and decontextualizes psychosocial problems, treating them as isolated issues.

As noted previously, the studies that have analysed social inequalities in adolescent AHS use are scarce; however, they all tend to describe a negative relationship between consumption and high socioeconomic background [11, 18]. Consistent with this evidence, we observe higher consumption among secondary school

Table 2 Relative Index of Inequality (RII) and Slope Index of Inequality (SII) of AHS use for male and female students aged 14-18 according to maternal, paternal and parental educational level by sex^{a,b}

	Male		Female	
	Maternal Educational Level			
	RII (IC95%)	SII (IC95%)	RII (IC95%)	SII (IC95%)
2021	1.06 (0.83-1.36)	0.72 (-1.67-3.11)	1.37 (1.16-1.62)	5.50 (2.53-8.48)
2018	1.04 (0.87-1.26)	0.39 (-1.48-2.26)	1.20 (1.04-1.39)	2.88 (0.86-4.90)
2016	1.23 (0.99-1.52)	2.12 (0.26-3.99)	1.18 (1.02-1.37)	2.55 (0.26-4.84)
2014	0.89 (0.71-1.11)	-1.07 (-2.71-0.57)	1.00 (0.87-1.16)	0.36 (-1.70-2.41)
2012	0.92 (0.74-1.15)	-0.54 (-2.41-1.33)	0.87 (0.75-1.02)	-1.86 (-4.18-0.46)
2010	0.72 (0.57-0.92)	-2.30 (-4.04 - -0.55)	0.81 (0.68-0.96)	-2.18 (-4.33- -0.03)
	Paternal Educational Level			
	RII (IC95%)	SII (IC95%)	RII (IC95%)	SII (IC95%)
2021	1.14 (0.89-1.46)	1.53 (-0.85-3.90)	1.21 (1.02-1.45)	3.49 (0.42-6.56)
2018	0.99 (0.82-1.19)	-0.27 (-2.19-1.65)	1.16 (1.00-1.34)	2.04 (-0.09-4.17)
2016	1.21 (0.97-1.52)	1.71 (-0.14-3.56)	1.16 (0.99-1.36)	2.20 (-0.22-4.61)
2014	0.91 (0.72-1.14)	-0.75 (-2.41-0.90)	1.07 (0.91-1.25)	1.22 (-0.87-3.31)
2012	0.91 (0.72-1.14)	-0.70 (-2.65-1.24)	0.99 (0.84-1.17)	0.03 (-2.43-2.49)
2010	0.79 (0.61-1.02)	-1.54 (-3.29-0.21)	0.99 (0.83-1.19)	-0.17 (-2.38-2.03)
	Parental Educational Level			
	RII (IC95%)	SII (IC95%)	RII (IC95%)	SII (IC95%)
2021	1.08 (0.85-1.37)	1.05 (-1.31-3.41)	1.29 (1.09-1.53)	4.38 (1.44-7.32)
2018	0.96 (0.80-1.15)	-0.50 (-2.39-1.39)	1.18 (1.02-1.36)	2.40 (0.37-4.42)
2016	1.26 (1.01-1.58)	2.09 (0.23-3.95)	1.16 (0.99-1.35)	2.21 (-0.21-4.63)
2014	0.86 (0.69-1.08)	-1.10 (-2.75-0.54)	1.05 (0.90-1.23)	1.21 (-0.89-3.31)
2012	0.93 (0.74-1.17)	-0.53 (-2.46-1.40)	0.98 (0.83-1.15)	-0.24 (-2.63-2.16)
2010	0.67 (0.52-0.85)	-2.96 (-4.74- -1.18)	0.82 (0.69-0.98)	-2.11 (-4.34-0.12)

^a Models adjusted by age

^b Values in bold are significant

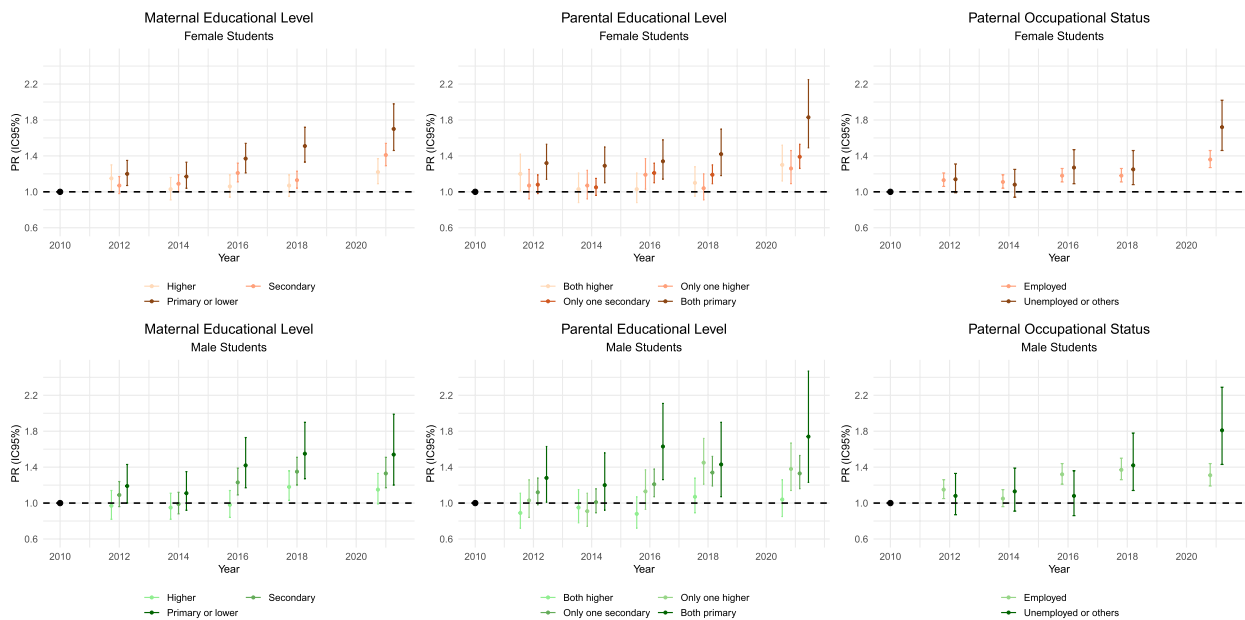


Fig. 3 Prevalence ratios and confidence intervals of AHS use by year (ref. 2010) for female students and male students according to maternal and parental educational level, and paternal occupational status

students whose parents have no education or primary schooling, especially in the case of daughters. As reported by Reiss in their systematic review of the literature [16], parental educational level is indeed one of the strongest inequality predictors of poor mental health among adolescents, which may explain the inequalities in AHS use. Students coming from lower-educated families are more likely to experience adverse life events and to have worse coping strategies to buffer the effect that daily stressors have on mental health [28]. Moreover, our study shows that parental educational level affects AHS intake only in girls, especially when considering maternal education, in line with other studies that describe a close relationship between mothers' education and drug use [29]. Historically, motherhood has been associated with family care and health promotion, making the mother's health literacy crucial for children's well-being and health-related behaviors [30]. In this case, lower maternal educational levels could potentially influence poorer management of distress at home and a reduced ability to avoid non-pharmacological means.

As for inequalities by parental occupational status, our findings are consistent with other studies showing worse mental health outcomes among adolescent students whose both parents are unemployed [31]. Within the current *wage-based society* [32], labor not only functions as a source of economic subsistence, but also as a mechanism of social integration. Therefore, being outside the labor market might contribute to worse living conditions and poorer mental health of the children [16]. Parental unemployment or inactivity, as well as low parental educational level, could lead to greater exposure to stressful situations in adolescence and worse social and health care coverage, contributing to greater demand for and use of psychotropic drugs. The evidence indicates that paternal occupational status has a greater impact on adolescent health compared to maternal status [33], which in our results only affects daughters. The greater medicalization suffered by women could also be affected by the greater instability that paternal unemployment generates, since, in the current context of sexual division of labor, paternal employment is still often the primary source of income. The interaction of both axes might end up placing daughters in much more vulnerable positions, leading to a higher AHS intake.

Regarding the trend of inequality in AHS use, no similar analyses were found to compare our findings, although some studies find an increase in inequalities in the adolescent use of substances such as alcohol, tobacco, or cannabis in the last 20 years, in line with our results [34–36]. For the specific case of Spain, analysing the socio-economic changes that took place in the study period

and setting them in a broader trend can help understand the results. Since the 1970s, the European economy has struggled to maintain productivity and growth rates on the rise, which has led to a series of economic crises and weak recoveries [37]. As a way out, Spain has carried out several capital restructurings, characterized by wage devaluation, continuous cuts to the Welfare State and increasing inequalities; a trend that has been particularly accelerated in the last decade [23]. However, a better understanding and a more comprehensive analysis of the relationship between social and political changes and the unequal distribution of adolescent AHS use is still needed.

Our study presents some limitations to be considered. The information available was collected through self-reported surveys by students, which may be affected by recall bias. The stigma associated with psychotropic drugs, or the variety of drugs within the AHS group may influence the report of consumption. The sex variable is collected in a binary and self-reported manner, which makes it unclear whether sex or gender is reported. However, these surveys have been completed anonymously and autonomously to avoid possible stigma and have been tailored to the characteristics of the student population, trying to ease the understanding of the terms used.

Missing data for sociodemographic variables, such as parental job or educational level, may have also impacted the results. However, additional analyses reveal no substantial AHS use differences between the misreported data group and the socioeconomic levels (data not shown). Misreported data may even lead to an underestimation of consumption, although this effect appears to be modest. Finally, we are unable to include some potential variables that could explain part of the inequalities reported, such as exposure to bullying, academic performance, major life events, or relationship with parents. Also, students' place of origin should be examined in greater detail in future analyses. Moreover, future studies could adopt a comprehensive intersectional methodology to better account for the specific relations and mechanisms between different axes of inequality.

Nevertheless, our findings contribute to the literature on social inequalities in students' AHS use and have important implications for public health policy, ranging from the micro level -the clinical setting-, the meso - the community level- to the macro or structural level. At the clinical level, mental health care should deconstruct the basis of the biomedical knowledge on which it is built, and broaden the interdisciplinary and community approach from a social determinants perspective. In addition, a deep review of mental health services targeted to adolescents is required, emphasizing aspects that enhance the use and effectiveness of these resources.

This includes accessibility, continuous and tailored attention, not diagnostically led services, and offering choice and control over the process [38].

At the community level, it is necessary to create alliances between clinical, educational, and other social settings, such as those for leisure. In particular, schools are vital institutions for the promotion of wellness and prevention of mental health problems in students, as they can work directly with this population and collaborate with family members and other institutions [39]. It is also important to promote the political and social empowerment of adolescents, encouraging their participation and decision-making in health promotion policies [40]. Evidence also highlights the potential of formal and non-formal education of parents and/or caregivers in mental health awareness and prevention [41].

In Spain, community and clinical measures for mental health promotion and psychotropic use reduction are outlined in different strategies and action plans. The National Strategy on Addictions 2017–24 and the Addiction Action Plan 2021–24 [42, 43] point to prescription drug use as a key area of action, and specifically emphasize AHS use when applying a gender-sensitive analysis. They target women and adolescents, proposing measures such as women-centered programs, community and family interventions, professional training, non-pharmacological alternatives, and improved AHS monitoring. The Mental Health Action Plan 2022–2024 [44], resulting from the National Health System's Mental Health Strategy 2022–2026 [45], addresses mental health problems in contexts of greater vulnerability, focusing on children and adolescents. Key actions include developing school mental health guidelines, training educational professionals, providing gender-focused mental health training for healthcare workers, empowering families of individuals with mental health challenges, and strengthening community health networks.

In macro-structural terms, all public health interventions should place social justice at their core, aiming to create healthier and more equitable societies. Moreover, social investment policies seem to have a differential effect according to gender, age or social class of individuals [46], so further research about their effect on adolescent students along different axes of inequality is paramount. As the World Health Organization (WHO) highlights, improving living conditions during all life stages provides opportunities to reduce the risk of mental health problems associated with social inequalities [39]. These results contribute to the growing evidence that social and gender inequalities affect AHS use in secondary school students, therefore, addressing these inequalities from different levels of intervention is a key priority for a comprehensive approach to adolescent mental health.

Conclusion

Our study reveals significant increases in the use of anxiolytics, hypnotics, and sedatives (AHS) among adolescent students in Spain, with unequal trends according to students' gender and parental educational and occupational status. The findings underscore the urgent need for equity-focused public health policies that address gender and social inequalities, and advocate for a deeper exploration of the social determinants affecting adolescent AHS use. By adopting an intersectional methodology, future research can further examine the combined effects of gender-related and socioeconomic factors contributing to the increasing AHS consumption among students.

Abbreviations

AHS	Anxiolytics, hypnotics, and sedatives
RII	Relative Index of Inequality
SII	Slope Index of Inequality
PR	Prevalence Ratios
GBD	Global Burden of Diseases, Injuries, and Risk Factors Study
ESPAD	European School Survey Project on Alcohol and Other Drugs
ESTUDES	Survey on Drug Use in Secondary Education in Spain
DGPNSD	Government Delegation for the National Plan on Drugs of Spain
WHO	World Health Organization

Supplementary Information

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Supplementary Material 1.

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Authors' contributions

XM: Conception and design of the study, Analysis and interpretation of data, Drafting the article. AmB: Conception and design of the study. UM: Analysis and interpretation of data. AnB: Analysis and interpretation of data. All authors critically read and approved the final manuscript.

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Data availability

The data that support the findings of this study are available from Spanish Government Delegation for the National Drugs Plan but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of Spanish Government Delegation for the National Drugs Plan.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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