Alcohol use and family-related factors among Spanish university students: the unHicos project

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Abstract

Background: During adolescence and youth there are relevant changes in the consolidation, gain or loss of consumption habits and lifestyles and the family factors has a fundamental role to development these habits. The study of the consumption of toxins, such as alcohol intake, is crucial at this stage due to the repercussions that said consumption presents in adulthood. Therefore, the objective of our study was to evaluate the associations between alcohol consumption patterns and related family factors (family functioning, family history of alcohol consumption) in Spanish university students.

Methods: Observational, descriptive, cross-sectional, multicenter study, carried out in first-year university students from 11 Spanish universities. Through an online questionnaire, alcohol consumption (risky consumption and intensive consumption or binge drinking), family functioning and history of alcohol in the family were evaluated. Risky alcohol consumption and binge drinking were assessed using the AUDIT test, and family functioning was assessed using the family APGAR questionnaire. A descriptive analysis of the data was performed, as well as the Chi-Square test and Student’s T-Test, and non-conditional logistic regression models were carried out to examine this association.

Results: The prevalence of risky alcohol consumption identified in the 10,167 respondents was 16.9% (95% CI = 16.2–17.6), and that of BD was 48.8% (95% CI = 47.9–48.8). There is a significant association between risky alcohol consumption and family functioning in students of both sexes, with greater consumption in the face of severe dysfunctional support (men OR = 1.72; p < 0.001 and women OR = 1.74; p < 0.001) and family history of consumption (p = 0.005). Regarding the binge drinking pattern, no statistically significant differences were observed.

Conclusions: Risky alcohol consumption in university students is associated with dysfunctional family support, unlike the binge drinking pattern, where there is no such association.

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Introduction
Alcohol consumption is one of the risk factors for death and disability [1]. The World Health Organization (WHO) estimates that 5.3% of deaths and 5.1% of morbidity worldwide are due to alcohol [2]. According to the latest Survey on Alcohol and Drugs in Spain (EDADES), 85.1% of the population between 15 and 24 years old reported having consumed alcohol at some point in their life and 59.7% stated that they had ingested alcohol in the last month, the consumption more prevalent in men (64.4%) than in women (54.8%) [3].

During adolescence and youth there are relevant changes in the reinforcement, gain or loss of consumption habits and lifestyles. The study of consuming toxins, such as alcohol intake, is crucial at this stage due to the repercussions that this consumption presents in adulthood [4–6].

The process of personal maturation, entering university or the employment world and the family or social environment are determining factors in strengthening these habits. Specifically, familial socialization makes up the basis of an individual's personality, attitude, values and self-concept development [7].

A functional family is one that offers safety, cohesion, communication and routine expression of positive affection and is based on a shared set of cultural norms and values [8]. Good family functioning allows adaptation to the changes that occur during growth [9].

Families who use drug substances such as alcohol tend to be characterized by low levels of cohesion, low tolerance for frustration, unrealistic expectations of children, role reversal, isolation, and poor parenting skills, characteristics associated with adverse consequences for the families [7].

Some international studies have linked family history of alcohol consumption and the history of a dysfunctional family with a greater probability of risky alcohol consumption in the young population [10–14].

However, despite the relevance of the family in the approach to alcohol consumption in the population and in an individual's development, especially in university students, there is little evidence of the association that family factors have regarding the patterns of alcohol consumption in university students. Therefore, the objective of our study was to examine the associations between alcohol consumption patterns and associated family factors (family functioning and history of alcohol consumption) in first-year university students.

Methods
Design and study sample
This study is an observational, cross-sectional analysis of a dynamic cohort of university students enrolled in different degrees in the first year of study from eleven Spanish public universities (Alicante, Cantabria, Castilla la Mancha, Granada, Huelva, Jaén, León, Salamanca, Valladolid, Valencia and Vigo) that are part of the uniHcos (University, Life Habits, Follow-up Cohort) project [15], which aims to evaluate the habits and lifestyles of Spanish university students. The study received approval from the Ethics Committee of the University of León (Code: ETICA-ULE-007–2016).

Selection criteria: 1) Be a first-year university student enrolled in a Spanish university included in the uniHcos project; 2) Complete the self-administered form and grant informed consent for participation in the study.

Since the uniHcos project is a dynamic cohort, we did not determine a minimum sample size for this study.

Data collection
Students who met the selection criteria received an email through their university account that included information about the uniHcos project and a link to a mandatory informed consent form that had to be completed before answering the study questionnaire. Students interested in participating completed a self-reported ad-hoc online questionnaire between October 2011 and March 2018 using the SphinxOnline® platform. The questionnaire included questions on alcohol consumption from the National Health Survey (ENS) [16] and the EDADES survey [3].

Two patterns of alcohol consumption were analyzed: risky consumption and intensive consumption or binge drinking (BD). Both patterns were assessed using the Alcohol Use Disorders Identification Test (AUDIT) [17]. This questionnaire has been validated in this population by Kokotailo et al. [18] and Verhoog et al. [19]. Heavy alcohol consumption, or BD, was defined as the intake of 6 or more alcoholic beverages in a single session, for both men and women. Patients with an AUDIT score ≥ 8 were considered to have risky alcohol consumption. This score...
determines the risk of developing alcohol consumption problems.

Family functioning was assessed using the family APGAR questionnaire [20], a 5-item questionnaire that measures five domains: "Adaptation", "Partnership", "Growth", "Affection" and "Resolve". Each item is scored on a 3-point scale: almost always (0 points), sometimes (1 point), and almost never (2 points). The sum can be from zero to ten points and families can be characterized as: a functional family (7–10) or a dysfunctional family (≤ 6). The dysfunctional family can be classified as mild (> 2 and < 7) or severely dysfunctional (≤ 2).

The questionnaire was validated in Spanish by the Bel-lon et al. group [21].

Data analysis
A descriptive analysis was performed where measures of central tendency (mean and median) and dispersion (standard deviation and range) of the quantitative variables and prevalence of the qualitative variables were calculated.

To evaluate the relationship between the factors associated with alcohol consumption and the dependent variables (risky consumption and BD), we used the Chi-Square test and T-Student Test, as well as unconditional logistic regression analysis. Odds Ratio (OR) values and their respective 95% confidence interval (CI) were found for each variable. All models were stratified by sex and adjusted for age, occupation, type of residence, family support, and family history of alcohol consumption. Statistical analysis was performed using the IBM Statistic SPSS 20 program with a significance level of 95% (p = 0.05).

Results
A total of 10,167 participants completed the questionnaire, 72.2% of which were women (95% CI: 70.9–77.2). The mean age of the subjects was 22.1 years (SD: 4.5; limits: 17–63; 95% CI: 21.0–24.0) in men and 21.7 years (SD: 4.5; limits: 16.2–17.6), 22.5% (95% CI = 21.0–24.0) in men and 14.7% (95% CI = 13.9–15.5) in women. The prevalence of BD was 48.8% (95% CI = 47.9–48.8), 47.4% (95% CI = 45.6–49.3) in men and 49.4% (95% CI = 48.2–50.5) in women.

Table 2 shows the prevalence of the respondents' family history in terms of the socio-demographic and occupational variables, stratified by sex. Significant differences are observed in risky alcohol consumption and the family history of alcohol in the father (0.034), the mother (<0.001), the child (0.002), the partner (0.017), the uncle (0.013) and the number of relatives overall (p = 0.005). In terms of BD consumption, significant differences were only obtained if there was a history of consumption in the couple (0.025).

Table 3 shows the relationship between risky alcohol consumption and the family support received by the participants. Significant differences were obtained regarding adaptation (p < 0.001; greater consumption with less adaptation), partnership (p < 0.001; greater consumption with less partnership), growth (p < 0.001, greater consumption with less growth), affection (p < 0.001; higher consumption with less affection), resolve (p < 0.001; higher consumption with lower resolution), and the family APGAR questionnaire score (p < 0.001; higher consumption in the presence of severe dysfunctional family support).

Table 4 shows the results of the unadjusted and the adjusted logistic regression analyses between risky alcohol consumption and sociodemographic, occupational and family characteristics, stratified by sex. The adjusted analysis shows that risky alcohol consumption in men was significantly related to age (aOR = 1.67; p = 0.007; with higher consumption in respondents aged 21–24 years), place of residence (aOR = 0.58; p < 0.001 lower consumption in those in a rented apartment), occupation (aOR = 1.64; p = 0.001; higher consumption in those studying and working), and family functioning (aOR = 1.72; p < 0.001; higher consumption in those with severe family dysfunction). In addition, the adjusted analysis reveals that risky alcohol consumption in women was related to age (aOR = 1.72; p = 0.001; with higher consumption in respondents aged 17–21 years), place of residence (aOR = 0.54; p < 0.001 lower consumption in those in a rented apartment), occupation (aOR = 1.64; p = 0.001; higher consumption in those studying and working), and family functioning (aOR = 1.72; p < 0.001; higher consumption in those with severe family dysfunction).

Regarding the factors associated with BD, the logistic regression model reveals that BD consumption in men was significantly related to the place of residence (aOR = 0.64; p < 0.001; with lower consumption in those in a rented apartment), occupation (aOR = 1.37;
Table 1  Sociodemographic and occupational characteristics of the sample (n = 10,167)

| Socioeconomic and occupational characteristics | Men (n = 2823)  | Women (n = 7344)  | p   |
|-----------------------------------------------|----------------|-----------------|-----|
| **Age (years)**                               |                |                 |     |
| 17–20                                         | 2073 (73.4)    | 5737 (78.1)     | <0.001 |
| 21–24                                         | 443 (15.7)     | 1053 (14.3)     |     |
| ≥ 25                                          | 307 (10.9)     | 554 (7.5)       |     |
| **University**                                |                |                 |     |
| Alicante                                      | 245 (8.7)      | 609 (8.3)       | <0.001 |
| Cantabria                                     | 29 (1.0)       | 59 (0.8)        |     |
| Castilla La Mancha                           | 61 (2.2)       | 131 (1.8)       |     |
| Granada                                       | 806 (28.6)     | 2130 (29.0)     |     |
| Huelva                                        | 107 (3.8)      | 321 (4.4)       |     |
| Jaén                                          | 75 (2.7)       | 215 (2.9)       |     |
| León                                          | 224 (7.9)      | 676 (9.2)       |     |
| Salamanca                                     | 353 (12.5)     | 858 (11.7)      |     |
| Valencia                                      | 346 (12.3)     | 1106 (15.1)     |     |
| Valladolid                                    | 204 (7.2)      | 412 (5.6)       |     |
| Vigo                                          | 373 (13.2)     | 827 (11.3)      |     |
| **Field**                                     |                |                 |     |
| Art and Humanities                            | 261 (9.2)      | 964 (13.1)      | <0.001 |
| Science                                       | 515 (18.2)     | 1041 (14.2)     |     |
| Health Sciences                               | 506 (17.9)     | 1762 (24.0)     |     |
| Social and Legal Sciences                     | 900 (31.9)     | 3161 (43.0)     |     |
| Engineering and Architecture                  | 641 (22.7)     | 416 (5.7)       |     |
| **University degree**                         |                |                 |     |
| Yes                                           | 565 (20.0)     | 1717 (23.4)     | <0.001 |
| No                                            | 2258 (80.0)    | 5627 (76.6)     |     |
| **Residence**                                 |                |                 |     |
| University housing                            | 326 (11.5)     | 971 (13.2)      | <0.001 |
| Family /own home                              | 1470 (52.1)    | 3407 (46.4)     |     |
| Rented apartment                              | 1027 (36.4)    | 2966 (40.4)     |     |
| **Occupation**                                |                |                 |     |
| Student                                       | 580 (20.5)     | 1772 (24.1)     | <0.001 |
| Student and employed                          | 344 (12.2)     | 741 (10.1)      |     |
| Student looking for work                      | 1899 (67.3)    | 4831 (65.8)     |     |
| **Characteristics and patterns of alcohol consumption** |            |                 |     |
| Age at start of consumption (years)           |                |                 |     |
| < 13                                          | 348 (13.2)     | 922 (13.4)      | 0.003 |
| 14–15                                         | 1040 (39.4)    | 2978 (43.2)     |     |
| 16–17                                         | 1020 (38.6)    | 2411 (35.0)     |     |
| ≥ 18                                          | 234 (8.9)      | 587 (8.5)       |     |
| Drinking place                                |                |                 | 0.113 |
| Public place                                  | 948 (33.6)     | 2395 (32.6)     |     |
| Bar/Restaurant                                | 1246 (44.1)    | 3249 (44.2)     |     |
| University celebration                        | 88 (3.1)       | 307 (4.2)       |     |
| Public street                                 | 174 (6.2)      | 480 (6.5)       |     |
| Private place                                 | 367 (13.0)     | 913 (12.4)      |     |
| Risky alcohol consumption                     |                |                 |     |
| No                                            | 2188 (77.5)    | 6262 (85.3)     | <0.001 |
| Yes                                           | 635 (22.5)     | 1082 (14.7)     |     |
| Binge drinking                                |                |                 |     |
| No                                            | 1484 (52.6)    | 3719 (50.6)     | 0.082 |
| Yes                                           | 1339 (47.4)    | 3625 (49.4)     |     |
| Family history of alcohol use                 |                |                 |     |
| 0                                             | 2088 (74.0)    | 5333 (72.6)     | <0.001 |
| 1 or more                                     | 735 (26.0)     | 2011 (27.4)     |     |


$p = 0.002$; higher consumption in those studying and looking for work) (Table 5). The adjusted analysis also shows that BD consumption in women was related to age (aOR = 1.58; $p = 0.001$; with higher consumption in respondents aged 17–21 years), place of residence (aOR = 0.54; $p < 0.001$; with lower consumption in those in a rented apartment), and occupation (aOR = 1.21;
Discussion

The results of this study show that the pattern of risky alcohol consumption in university students is significantly associated with severe dysfunctional family structures, although no significant association is observed between risky alcohol consumption, binge drinking pattern and the presence of a family history of alcohol consumption mentioned by these students, when it is adjusted by sociodemographic and occupational factors.

Differences were observed when analyzing risky alcohol consumption stratified by sex: male students between 17 and 24 years of age who studied and worked or were looking for a job and who had a moderate or severe dysfunctional family structure had higher risky alcohol consumption. Female students between 17 and 20 years old who studied and looked for work and who had a moderate or severe dysfunctional family structure presented a higher risky alcohol consumption.

Greater use of the binge drinking pattern was identified in male students who were also looking for work and in female students between 17 and 20 years old, who studied and worked or were in search of employment.

Although there is no information available related to the pattern of alcohol consumption in private universities, our results could be extrapolable to Spanish private universities since the sociodemographic and occupational factors defined in our sample are similar to the results obtained in Spanish private universities (higher percentage of students between 21–24 years old, female, enrolled in careers in Social and Legal Sciences, followed by students who are pursuing careers in Health Sciences) [22].

Table 4 Association between risky alcohol consumption and sociodemographic, occupational and family characteristics, stratified by sex

| Variables                      | Unadjusted OR | 95% CI      | p     | aOR* | 95% CI      | p     |
|-------------------------------|---------------|-------------|-------|------|-------------|-------|
| **MEN**                       |               |             |       |      |             |       |
| Age                           |               |             |       |      |             |       |
| 17–20                         | 1.47          | 1.19–1.82   | < 0.001| 1.66 | 1.18–2.35   | 0.004 |
| 21–24                         | 1.48          | 1.16–1.88   | 0.002 | 1.67 | 1.15–2.43   | 0.007 |
| > 25                          | 1             |             |       | 1    |             |       |
| Type of residence             |               |             |       |      |             |       |
| University housing            | 1.10          | 0.94–1.29   | 0.243 | 1.00 | 0.75–1.34   | 0.972 |
| Rented apartment              | 0.60          | 0.53–0.67   | < 0.001| 0.58 | 0.48–0.70   | < 0.001|
| Family / own home             | 1             |             |       | 1    |             |       |
| Occupation                    |               |             |       |      |             |       |
| Studying and looking for work | 1.26          | 0.97–1.65   | 0.085 | 1.31 | 1.04–1.66   | 0.020 |
| Studying and employed         | 1.27          | 1.02–1.38   | 0.032 | 1.64 | 1.21–2.22   | 0.001 |
| Studying                      | 1             |             |       | 1    |             |       |
| Family functioning            |               |             |       |      |             |       |
| Mild Dysfunction              | 1.29          | 1.04–1.59   | 0.019 | 1.31 | 1.05–1.62   | 0.014 |
| Severe Dysfunction            | 1.69          | 1.23–2.32   | 0.001 | 1.72 | 1.25–2.37   | < 0.001|
| Normal Functioning            | 1             |             |       | 1    |             |       |
| Family history of alcohol     |               |             |       |      |             |       |
| Yes                           | 1.25          | 1.03–1.52   | 0.026 | 1.19 | 0.97–1.46   | 0.091 |

| **WOMEN**                     |               |             |       |      |             |       |
| Age                           |               |             |       |      |             |       |
| 17–20                         | 1.80          | 1.34–2.42   | < 0.001| 1.72 | 1.26–2.37   | 0.001 |
| 21–24                         | 1.58          | 1.12–2.21   | 0.008 | 1.38 | 0.97–1.95   | 0.069 |
| > 25                          | 1             |             |       | 1    |             |       |
| Type of residence             |               |             |       |      |             |       |
| University housing            | 1.17          | 0.96–1.41   | 0.112 | 1.01 | 0.84–1.22   | 0.094 |
| Rented apartment              | 0.57          | 0.49–0.65   | < 0.001| 0.54 | 0.47–0.63   | < 0.001|
| Family / own home             | 1             |             |       | 1    |             |       |
| Occupation                    |               |             |       |      |             |       |
| Studying and looking for work | 1.12          | 0.96–1.30   | 0.045 | 1.20 | 1.16–1.61   | 0.026 |
| Studying and employed         | 0.78          | 0.62–0.99   | 0.135 | 0.98 | 1.02–1.40   | 0.862 |
| Studying                      | 1             |             |       | 1    |             |       |
| Family functioning            |               |             |       |      |             |       |
| Mild Dysfunction              | 1.35          | 1.15–1.59   | < 0.001| 1.37 | 0.76–1.26   | < 0.001|
| Severe Dysfunction            | 1.69          | 1.38–2.07   | < 0.001| 1.74 | 1.41–2.14   | < 0.001|
| Normal Functioning            | 1             |             |       | 1    |             |       |
| Family history of alcohol     |               |             |       |      |             |       |
| Yes                           | 1.16          | 1.01–1.33   | 0.041 | 1.12 | 0.97–1.30   | 0.119 |

* Adjusted Odd Ratio for age, type of residence, occupation, functioning family and family history of alcohol. 95%CI = Confidence Interval 95%
There are multiple factors that influence college students’ alcohol consumption: demographic factors, personality type, personal drinking history, expectations when drinking, reasons for drinking alcohol, type of activity, academic participation, and family and social influence [23, 24]. In this article we focus primarily on the study of family influence and social support, personal history of alcohol, demographic factors and the type of activity performed by students.

In general, an environment in which alcohol consumption is encouraged and perceived as positive and normal tends to have more drinkers than peer groups where excessive alcohol consumption is not encouraged [7]. The relationship between family and alcohol consumption is not limited to the already established causality; there is another aspect, no less important that refers to the importance of this pathology in family interactions, and to the dysfunctional relationship dynamics that are created due to this problem [7].

Unstable and incoherent family and living environment factors (for example, transitional living conditions, inconsistent care, violence) resulting from substance use that caregivers have linked to the incidence of psychological and emotional development problems among their children [7].

There is a correlation between family functioning and the presence of addiction, such as alcohol consumption, showing the need for family support [25]. Similarly, Sánchez Queija et al., [26] point out that affective family relationships play a significant role in the prevention of substance use, like alcohol or tobacco, in adolescence and young adults. Thus, individuals who have received care and support during childhood, and enjoy a more cohesive family environment during adolescence and adulthood, showed less substance use. Individuals who start using in those years do not reach the level of substance use observed among those who have grown up in less favorable family contexts.

Table 5  Association between binge drinking and sociodemographic, occupational and alcohol-related characteristics, stratified by sex

| Variables                  | Unadjusted OR | 95% CI  | p     | aORa | 95% CI  | p     |
|----------------------------|----------------|--------|-------|------|--------|-------|
| **MEN**                    |                |        |       |      |        |       |
| Age                        |                |        |       |      |        |       |
| 17–20                      | 1.36           | 1.18–1.57 | <0.001 | 1.28 | 0.98–1.69 | 0.074 |
| 21–24                      | 1.47           | 1.24–1.74 | <0.001 | 1.29 | 0.95–1.75 | 0.101 |
| > 25                       | 1              |         |       |      | 1      |       |
| Type of residence          |                |        |       |      |        |       |
| University housing         | 0.95           | 0.83–1.08 | 0.411 | 0.82 | 0.63–1.05 | 0.117 |
| Rented apartment           | 0.58           | 0.53–0.63 | <0.001 | 0.64 | 0.54–0.748 | <0.001 |
| Family / own home          | 1              |         |       |      | 1      |       |
| Occupation                 |                |        |       |      |        |       |
| Studying and looking for work | 1.33     | 1.10–1.60 | 0.003 | 1.37 | 1.12–1.66 | 0.002 |
| Studying and employed      | 1.10           | 0.87–1.38 | 0.440 | 1.28 | 0.99–1.67 | 0.061 |
| Studying                   | 1              |         |       |      | 1      |       |
| Family functioning         |                |        |       |      |        |       |
| Mild Dysfunction           | 1.12           | 0.93–1.34 | 0.221 | 1.13 | 0.94–1.35 | 0.199 |
| Severe Dysfunction         | 0.95           | 0.71–1.27 | 0.732 | 0.95 | 0.71–1.27 | 0.745 |
| Normal Functioning         | 1              |         |       |      | 1      |       |
| Family history of alcohol  |                |        |       |      |        |       |
| Yes                        | 1.02           | 0.867–1.22 | 0.772 | 0.99 | 0.83–1.17 | 0.898 |
| **WOMEN**                  |                |        |       |      |        |       |
| Age                        |                |        |       |      |        |       |
| 17–20                      | 1.57           | 1.28–1.94 | <0.001 | 1.58 | 1.30–1.92 | 0.001 |
| 21–24                      | 1.49           | 1.25–1.78 | <0.001 | 1.51 | 1.21–1.87 | 0.069 |
| > 25                       | 1              |         |       |      | 1      |       |
| Type of residence          |                |        |       |      |        |       |
| University housing         | 1.00           | 0.86–1.16 | 0.992 | 0.91 | 0.79–1.06 | 0.904 |
| Rented apartment           | 0.55           | 0.50–0.61 | <0.001 | 0.54 | 0.49–0.60 | <0.001 |
| Family / own home          | 1              |         |       |      | 1      |       |
| Occupation                 |                |        |       |      |        |       |
| Studying and looking for work | 1.06     | 0.91–1.24 | 0.436 | 1.21 | 1.07–1.36 | 0.001 |
| Studying and employed      | 1.09           | 0.98–1.22 | 0.107 | 1.36 | 1.15–1.61 | 0.000 |
| Studying                   | 1              |         |       |      | 1      |       |
| Family functioning         |                |        |       |      |        |       |
| Mild Dysfunction           | 0.99           | 0.76–1.05 | 0.946 | 0.99 | 0.88–1.12 | 0.934 |
| Severe Dysfunction         | 0.89           | 0.76–1.05 | 0.165 | 0.91 | 0.77–1.07 | 0.270 |
| Normal Functioning         | 1              |         |       |      | 1      |       |
| Family history of alcohol  |                |        |       |      |        |       |
| Yes                        | 0.97           | 0.87–1.07 | 0.509 | 0.99 | 0.88–1.12 | 0.538 |

*a Adjusted Odd Ratio for age, type of residence, occupation, functioning family and family history of alcohol. 95%CI= Confidence Interval 95%
Severe family dysfunction is related to an increase in standard drinking units of alcohol / week, an increase in smoking, and in the use of illegal drugs [27]. Like the literature, our results show that there is a significant association between students’ risky alcohol consumption pattern and dysfunctional family structure, with no such significance observed in the binge drinking pattern.

There is mixed scientific evidence on the association of family history of alcohol consumption with alcohol consumption, among which is intensive consumption [28–30], and alcohol dependence [31]. A meta-analysis carried out in university students reveals that family history appears to have significant small to medium effects on the consequences of alcohol, symptoms of alcohol use disorder, and the participation of other drugs in samples of higher education students [32]. In contrast, small effects (many not significant) were found for consumption alone.

This suggests that college students with a family history may not drink more overall, but those who use alcohol or drugs may be more susceptible to problematic use.

The current study has some limitations: the questionnaire used has not yet been validated. However, this questionnaire consists of validated questions and scales from previously validated national questionnaires, like the Spanish National Health Survey [16] or the EDADES [3] survey, among others. The participation rate is around 3–5% depending on the university, taking into account that the project is a dynamic cohort that involves not only a baseline survey but also a follow-up over time and that participation is entirely voluntary, with no financial or other compensation for the collaboration. Another limitation of our study is its design. Although cross-sectional studies can determine prevalence, they cannot establish causality between alcohol consumption patterns and the other variables considered, especially family support. However, based on biological plausibility and the results of previous longitudinal studies, the observed trend, at least in the case of family support, could be correct.

Conclusion
Risky alcohol consumption in university students is associated with family dysfunction, unlike the binge drinking pattern, where there is no such association. The findings of the study show the importance of creating prevention programs focused on the family approach in university students, which include alcohol screening in the population with a family history of this substance, as well as greater social support from the health services.

Abbreviations
AUDIT: Alcohol Dependent Disorders Identification questionnaire; BD: Binge Drink; CI: Confident Interval; EDADES: Survey on Alcohol and Drugs in Spain; ENS: National Health Survey; OR: Odds Ratio; SD: Standard Deviation; WHO: World Health Organization.

Supplementary Information
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Authors’ contributions
ERR, AMD and TFV conceived of the concept of the paper. TFV designed the online questionnaire. CA-P, MMSV, CAP, ROM, SPM, MDR, GBA, JAM, TFV designed the sampling strategy. ERR, CA-P, MMSV, CAP, AMD, ROM, SPM, CRR, MDR, GBA, JAM, SMP, JIMCC, LFVJ, VMR and TFV were part of the team that collected data. ERR, AMD and TFV performed statistical analyses and wrote the first manuscript draft. ERR, AMD and TFV were major contributors to writing sections on self-determination theory. All authors read and approved the final manuscript.

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Availability of data and material
The dataset is available on supplementary material.

Declarations
Ethics approval and consent to participate
The UniHcos project has the approval from the Ethics Committee of the University of León (Code: ETICA-ULE-007–2016) and of the Ethics Committees of the collaborating universities and all methods were carried out in accordance with Declaration of Helsinki. Informed consent was obtained from all subjects. The integration of the information file in the Data Protection Agency complies with the Organic Law of Protection of Personal Data.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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References

1. Griswold M, Fullman N, Hawley C, Ariain N, Zimsen S, Tymeson HD, et al. Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the analysis of the global burden of disease study 2016. Lancet. 2018;392(10152):1015–35.

2. Organización Mundial de la Salud. Status report on alcohol consumption, harm and policy responses in 30 European countries. 2019. [Consultado 6 dic 2020]. Disponible en: https://www.euro.who.int/__data/assets/pdf_file/0019/411418/Alcohol-consumption-harm-policy-responses-30-European-countries-2019.pdf

3. Ministerio de Sanidad, Servicios Sociales e Igualdad, Secretaría de Estado de Servicios Sociales e Igualdad. Encuesta sobre alcohol y drogas en España EDADES 2013/2014. Delegación del Gobierno para el Plan Nacional sobre Drogas. 2015. [Internet]. [Consultado 6 dic 2020]. Disponible en: http://www.pnisd.msssi.gob.es/profesionales/sistemainformacion/sistemap/oracion/encuestas_EDADES.htm

4. Laghi F, Bairocc R, Lonigro A, Capaccione G, Baumgartner E. Family functioning and binge drinking among Italian adolescents. J Health Psychol. 2012;17(8):1132–41. https://doi.org/10.1177/1359105311430005

5. Bosqué-Prous M, Kuipers MA, Espelt A, Richter M, Rimpelá E, Perelman J, et al. Adolescent alcohol use and parental and adolescent socioeconomic position in six European cities. BMC Public Health. 2017;17(1):646. https://doi.org/10.1186/s12889-017-4635-7

6. Pedersen W, von Soest T. Socialization to binge drinking: a population-based, longitudinal study with emphasis on parental influences. Drug Alcohol Depend. 2013;133(2):587–92. Recuperado de: https://doi.org/10.1016/j.drugalcdep.2013.07.028

7. Lloret Irles D. Alcoholismo: Una visión familiar. Salud y drogas. 1998;87:791–803.

8. García-Carral JM, Capelo Álvarez R, Delgado Rodríguez M, Jiménez Mejías E, Jiménez Molón JJ, Llorca Díaz J, Mateos Campos R, Molina de la Torre AJ, Valero Juan LF, Martín Sánchez V. Proyecto UNICHOS: cohorte dinámica de estudiantes universitarios para el estudio del consumo de drogas y otras adicciones [UNICHOS Project: dynamic cohort of Spanish college students to the study of drug and other addictions]. Rev Esp Salud Pública. 2013;87(6):575–85. https://doi.org/10.4321/s1135-5727-2013000600003.

9. Ministerio de Sanidad, Servicios Sociales e Igualdad, Secretaría de Estado de Servicios Sociales e Igualdad. Encuesta Nacional de Salud de España (ENSE). [Internet]. [Consultado 28 Enero 2021]. Disponible en: http://www.msssi.gob.es/estadEstudios/estadisticas/encuestaNacional/encuesta2011.htm

10. Saunders JB, Aasland OG, Babor TF, et al. Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption — I. Addiction. 1993;88:791–803.

11. Kokotold F, Egan J, Gangnon R, et al. Validity of the Alcohol Use Disorders Identification Test in college students. Alcohol Clin Exp Res. 2004;28:914–20.

12. Verhoog S, Dompierre JM, de Jonge JM, van der Heijde CM, Vonk P, Bovens RHLM, de Boer MR, Hoekstra T, Kunst AE, Wiers RW, Kuipers MA. The Use of the Alcohol Use Disorders Identification Test as an Indicator of Hazardous Alcohol Use among University Students. Eur Addict Res. 2020;26(1):1–9. https://doi.org/10.1159/000505342.

13. Bellón Saameño JA, Delgado Sánchez A, Luna del Castillo JD, Lardelli Clarét P. Validity y fiabilidad del cuestionario de función familiar Apgar-familiar [Validity and reliability of the family Apgar family function test]. Aten Primaria. 1996;18(6):289–96.

14. Bellón Saameño JA, Delgado Sánchez A, Luna del Castillo JD, Lardelli Clarét P. Validity and reliability of the family Apgar family function test. Aten Primaria. 1996;18(6):289–96.

15. Fernández Villa T, Alguacil Ojeda J, Ayan Pérez C, Bueno Cavanillas A, Cancela Carral JM, Capelo Álvarez R, Delgado Rodríguez M, Jiménez Mejías E, Jiménez Molón JJ, Llorca Díaz J, Mateos Campos R, Molina de la Torre AJ, Valero Juan LF, Martín Sánchez V. Proyecto UNICHOS: cohorte dinámica de estudiantes universitarios para el estudio del consumo de drogas y otras adicciones [UNICHOS Project: dynamic cohort of Spanish college students to the study of drug and other addictions]. Rev Esp Salud Pública. 2013;87(6):575–85. https://doi.org/10.4321/s1135-5727-2013000600003.

16. Matejevic M, Jovanovic D, Lazarevic V. Functionality of Family Relationships and Parenting Style in Families of Adolescents with Substance Abuse Problems. Procedia Soc Behav Sci. 2014;128:281–7.

17. Sánchez-Queija I, Oliva A, Parra Á, Camacho C. Longitudinal analysis of the role of family functioning in substance use. J Child Fam Stud. 2016;25(1):237–40. https://doi.org/10.1007/s10827-015-0212-9.

18. Pérez Milena A, Pérez Milena R, Martínez Fernández ML, Leal Helming FJ, Mesa Gallardo I, Jiménez Pi. Funcionalidad y estructura de la familia durante la adolescencia: relación con el apoyo social, el consumo de tóxicos y el malestar psicógeno [Family structure and function during adolescence: relationship with social support, tobacco, alcohol and drugs consumption, and psychic discomfort]. Aten Primaria. 2007;39(2):61–5. https://doi.org/10.11571/13098670.

19. Vargas-Martínez AM, Trapero-Bertran M, Mora T, Lima-Serrano M. Social, economic and family factors associated with binge drinking in Spanish adolescents. BMC Public Health. 2020;20(1):519. https://doi.org/10.1186/s12889-020-08605-9.

20. Kask K, Markia A, Podana Z. The Effect of Family Factors on Intense Alcohol Use among European Adolescents: A Multilevel Analysis. Psychiatry J. 2013;2013:250215. https://doi.org/10.1155/2013/250215.

21. Telumbre-Terroor JY, Lopez-Cisneros MA, del Carmen Castillo-Arcos L, Sanchez Becerra A, Sanchez-Dominguez JP. Historia familiar y consumo de alcohol en adolescentes. Salud Baranquila. 2019;35(1):72–83. Disponible en: http://www.scielo.org.co/scielo.php?pid=S0120-55522019000100072&script=sci_arttext&eid=50120-55522019000100072&ln=en. (Cited 2021 Jan 26).

22. Chartier KG, Thomas NS, Kendler KS. Interrelationship between family history of alcoholism and genetic status in the prediction of alcohol use disorders. J Fam Psychol. 2001;15(2):271–81. https://doi.org/10.1037//0899-5688.15.2.271.
dependence in US Hispanics. Psychol Med. 2017;47(1):137–47. https://doi.org/10.1017/S0033291716002105.

32. Elliott JC, Carey KB, Bonafide KE. Does family history of alcohol problems influence college and university drinking or substance use? A meta-analytical review. Addiction. 2012;107(10):1774–85. https://doi.org/10.1111/j.1360-0443.2012.03903.x.

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