

Binge Drinking among Adolescents: Prevalence, Risk Practices and Related Variables

Consumo intensivo de alcohol en adolescentes: prevalencia, conductas de riesgo y variables asociadas

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Abstract

According to the last Survey on Drug Use among Secondary School Students (ESTUDES 2014-2015), consumption levels of alcohol and other substances have decreased in the last years in Spain. However, available data on binge drinking remain worrying, given the negative consequences related with this pattern. The aim of this paper is to analyse binge drinking among adolescents, providing updated data on prevalence in addition to information about the consequences and some predictive factors of binge drinking. A correlational method was used for this purpose, comprised of administering a survey to Compulsory Secondary School, High School and Vocational Training students. Based on a sample of 3,419 Galician adolescents aged between 12 and 18 years ($M = 14.57$; $SD = 1.76$), the results show that binge drinking is a common and global practice, with few socio-demographic differences but related with a wide range of risk practices. Furthermore, variables such as consumption expectancies, consumption by family and friends, as well as curfew time and allowance money have been identified as interesting predictive factors that should be taken into account at the preventive level.

Keywords: Adolescents; Alcohol; Underage drinking; Binge drinking; AUDIT.

Resumen

Según la última Encuesta sobre uso de drogas en Enseñanzas Secundarias (ESTUDES 2014-2015), los niveles de consumo tanto de alcohol como de otras sustancias han disminuido en España en los últimos años. No obstante, siguen siendo preocupantes los datos referidos al consumo intensivo de alcohol (CIA), sobre todo habida cuenta las graves repercusiones asociadas a este patrón. El objetivo del presente trabajo ha sido analizar el consumo intensivo de alcohol entre los adolescentes, ofreciendo datos actualizados no sólo de su prevalencia, sino también de sus consecuencias y posibles factores de pronóstico. Para ello se utilizó una metodología correlacional, consistente en la realización de una encuesta a estudiantes de ESO, Bachillerato y FP de grado medio. La muestra final estuvo compuesta por 3.419 adolescentes gallegos de entre 12 y 18 años ($M = 14,57$; $SD = 1,76$). Los resultados obtenidos revelan que el CIA es una práctica frecuente y globalizada, con escasas diferencias a nivel sociodemográfico, pero asociada a un amplio abanico de conductas de riesgo. Por otra parte, variables como las expectativas de consumo, el consumo entre los pares y en el entorno familiar, así como la hora de llegada a casa o el dinero disponible han sido identificadas como interesantes factores de pronóstico que debieran ser tenidos en cuenta en el plano preventivo.

Palabras clave: Adolescentes; Alcohol; Consumo intensivo; AUDIT.

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Abusive consumption of alcohol among adolescents is one of the main public health problems in Spain, as reflected in the 2009-2016 National Strategy on Drugs (National Drug Plan, 2009a). The same occurs on a European level, with the strategy implemented by the European Council in its 2013-2020 EU Action Plan on Drugs (European Council, 2013). Despite the decrease in consumption levels of both alcohol and other drugs in recent years, prevalence figures continue to be high, especially with regards to alcohol, which ranks as the most-consumed psychoactive substance. According to data of the *European School Project on Alcohol and Other Drugs (ESPAD 2011)* (Hibell et al., 2012), 79% of students between the ages of 15 and 16 had consumed alcohol in the last 12 months, and 57% had consumed alcohol in the last month. In Spain, the results of the most recent *National Survey on Drug Use among Secondary School Students (ESTUDES 2014-2015)* (National Drug Plan, 2016) highlight that 76.8% of adolescents between the ages of 14-18 had consumed alcohol in the last year, and 68.2% had consumed alcohol in the last month.

Within this context, one of the greatest concerns of professionals and researchers is the establishment of a usage pattern characterized by the ingestion of large amounts of alcohol over short time periods, mainly during the weekend, and usually resulting in drunkenness (Anderson, 2007; Calafat, 2007; Cortés, Espejo & Giménez, 2007). Literature in English usually refers to this consumption pattern as binge drinking (BD), in Spain referred to as intensive alcohol consumption (*consumo intensivo de alcohol* in Spanish [CIA]) (Rodríguez-Martos & Rosón, 2008). According to the World Health Organization (WHO, 2004), BD is defined as the consumption, by an adult, of at least 60 grams of alcohol (6 Standard Drink Units -SDU- in Spain) in a single drinking episode. However, many difficulties arise in making BD operational based on this definition. First, the lack of consensus as to what is considered a Standard Drink Unit (SDU) results in inter-country variability of criteria on the amount of alcohol consumption per episode (Mongan & Long, 2015; Parada et al., 2011). Likewise, the vagueness of the time period considered a "single episode" has led several authors to propose the need for taking into account blood alcohol concentration levels, which entails including duration in the definition of BD (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2004). Given these considerations, authors such as Parada et al. (2011) propose defining BD as the consumption of 6 or more alcoholic drinks for men (5 or more for women) during a single drinking episode (a period of 2 hours) at least once in the last 30 days. Nevertheless, when referring to adolescents, it has been deemed pertinent to reduce to 3 the number of alcoholic drinks ingested on a single consumption episode because the BAC levels reached by adolescents are much higher than those of adults when consuming the same number of drinks (Donovan, 2009).

This lack of consensus in operationalising BD and the use of highly heterogeneous samples has resulted in greatly disparate prevalence rates across different epidemiological studies. For example, recent data from the *National Survey on Drug Use and Health* (Hedden et al., 2015) points out that 6.1% of adolescents between the ages of 12-17 have indulged in BD in the last month in the United States. In addition, results of *ESPAD 2011* indicate that 39% of European students between the ages of 15-16 have indulged in BD in the last month, while in Spain 32.2% of students between the ages of 14-18 indulged in BD in the last 30 days, and 22.2% got drunk (National Drug Plan, 2016).

Obviously, in any case, BD is a serious public health problem with clear, negative consequences. Some studies, for example, have confirmed a close relationship between BD and long-term organic damage, like cirrhosis, hypertension and coronary diseases (Anderson, Cremona, Paton, Turner, & Wallace, 1993; Marmot, 2001; Pincock, 2003). Of no less importance are the alterations that arise on the cerebral level, from structural and functional perspectives (Cadaveira, 2009; López-Caneda et al., 2014; Tapert, 2007), with a great number of studies documenting possible neurocognitive and neurobehavioral repercussions associated with this consumption pattern (Cadaveira, 2010; Guerri, 2010; Guerri & Pascual, 2010; Tapert & Brown, 1999; Ziegler et al., 2005). Literature also points out that adolescents who indulge in BD are also more likely to become involved in various risk behaviours, like fighting (Swahn, Simon, Hamming, & Guerrero, 2004; Wechsler, Davenport, Dowdall, Moeykens & Castillo, 1994), driving under the influence of alcohol (Adams, Evans, Shreffler, & Beam, 2006; Windle, 2003), having problems with the police, being victims of robbery or theft, participating in risky sexual practices (DeCamp, Gealt, Martin, O'Connell, & Visher, 2015; Huang, Jacobs, & Deverensky, 2010) or having a lower academic performance (Miller, Naimi, Brewer & Jones, 2007). Likewise, studies like those by Jones, Oeltmann, Wilson, Brener, & Hill (2001) or Miller et al. (2007) have found a close relationship between BD and the use of other substances, and have even suggested that BD during adolescence is a risk factor for the later development of alcohol abuse/dependency in adulthood (Chambers, Taylor & Potenza, 2003; García-Moreno, Expósito, Sanhueza & Angulo, 2008; Petit, Maurage, Kornreich, Verbanck & Campanella, 2014). One variable that influences the likelihood of appearance of many of these consequences and of their seriousness is the age of onset of the adolescents' alcohol consumption (Motos, Cortés, Giménez & Cadaveira, 2015). Such is the case that delaying the age of onset is contemplated as one of the goals of the *2013-16 National Drug Plan* (National Drug Plan, 2009b) (general objective 4), as well as in different regional plans, like the *2011-2016 Addiction Disorders Plan of Galicia* (Xunta de Galicia [Regional Government of Galicia], 2010) (objective 1.3). Never-

theless, the main, nationwide information system available with regards to BD, ESTUDES, uses a limited sample that includes adolescents between the ages of 14-18. Therefore, the availability of empirical data on the prevalence of BD among younger ages (12-13 years) would be interesting, especially given that the age of onset of alcohol consumption was already 13.9 years in 2014 (National Drug Plan, 2014).

The significant implications that BD can entail on clinical and psychosocial levels also justifies that researchers, professionals and institutions focus a major part of their efforts on developing preventive measures to decrease alcohol consumption levels and, especially, of this new way of drinking by bingeing. For this purpose, the capacity for identifying potential, associated variables is key. As regards the possible role of sociodemographic variables, different studies coincide in pointing out that adolescent boys tend to drink alcohol more intensely than adolescent girls (Fuller-Thomson, Sheridan, Sorichetti & Mehta, 2013; Peralta, Steele, Nofziger & Rickles, 2010) and that the prevalence of BD increases with age, reaching its highest levels in early adulthood (around the age of 20) (Mota et al., 2010; Windle, Mun & Windle, 2005). Beyond gender or age, BD has also been associated with personal variables, such as avoidant coping style (Doumas, Turrisi, & Wright, 2006; Pirkle & Richter, 2006), low perception of risk (Parada et al., 2011) or positive expectancies about the effects of alcohol consumption (Durkin, Wolfe & Clark, 2005; McBride, Barrett, Moore & Schonfeld, 2014). Many studies also relate BD with alcohol consumption by peers (Coleman & Cater, 2005; Stickley et al., 2013) and with family-related variables, such as parental attitudes favouring alcohol consumption (Jander, Mercken, Crutzen & De Vries, 2013), being a member of a destructured household (Fuller-Thomson et al., 2013) or high parental consumption levels (Espada, Pereira & García-Fernández, 2008; Pons & Berjano, 1999). Likewise, other variables, such as allowance money, socioeconomic status or curfew time, though with lesser empirical evidence in the context of BD, have also been associated with adolescent alcohol consumption (Humensky, 2010; National Drug Plan, 2014; Varela, Marsillas, Isorna & Rial, 2013).

Given the interest that this issue continues to spark on different levels, the purpose of this study is to objectively analyse BD among the adolescent population of Galicia, defined on the basis of three criteria: a) consumption of 6 or more alcoholic drinks during a single consumption episode, within 2 hours (reflecting the criteria supported by Parada et al., 2011); b) consumption of 3 or more alcoholic drinks during a single consumption episode (within 2 hours), reflecting the viewpoint of those who stress the pertinence of decreasing the amount of drinks when referring to adolescents; and c) getting drunk, therefore intending to evaluate the more subjective component of consumption. In summary, first we intend to obtain new data on the

prevalence of this practice among adolescents, by broadening the sample from ages 12-18, while also analysing said prevalence by population segments according to gender, age, ownership of the school, residential area or parents' level of education. Second, we intend to contribute new evidence on the consequences or risks of BD that will be useful for consolidating the importance of this phenomenon. Finally, we intend to identify possible predictive factors for the purpose of guiding preventive efforts.

Method

Participants

A correlational method was used in pursuit of our goals. Specifically, a survey was completed by the student population of Compulsory Secondary School (ESO), High School and Vocational Training in the autonomous region of Galicia (approximately 140,000 students). Bi-level sampling was used to select the sample: by *conglomerates*, for selecting the first-level units (school centres) and by *quotas*, according to gender and level, for selecting the second-level units (individuals). A total of 37 public and private/state-funded centres from the four provinces of Galicia were randomly selected, respecting the existing population quotas. The final sample was comprised of 3,419 adolescents (50.6% boys; 49.4% girls) between the ages of 12-18 ($M = 14.57$; $SD = 1.76$). Of these, 2,236 attended public schools and 1,183 attended private/state-funded schools. Of these, 73.3% were enrolled in ESO (38.2% in the first year and 35.1% in the second year), 20.4% were high school students and 6.2% were undergoing basic professional training (Initial Professional Qualification Programmes) or a mid-level Training Programme.

Instruments

Data was collected using a survey designed expressly for this purpose, comprised of questions grouped in five blocks: (1) a first block extracted from the *National Survey on Drug Use among Secondary School Students (ESTUDES 2010)* (National Drug Plan, 2011) referring to the consumption habits of alcohol and other substances (in the last year and in the last month); (2) a second block including questions related to BD. The existent controversy as to the operationalisation of this construct led us to opt for using three different indicators: two quantitative indicators, (a) having consumed 3 or more alcoholic drinks during a single drinking episode (2 hours) and (b) and having consumed 6 or more alcoholic drinks during a single drinking episode (2 hours), and another more subjective indicator (c) having got drunk; (3) a third block including the *Alcohol Use Disorder Identification Test (AUDIT)* in the self-administered version (Rial et al., 2015) to estimate hazardous alcohol consumption, with a satisfactory internal consistency in this study ($\alpha = .77$); (4) a fourth block extracted from the *European School Survey Pro-*

ject on Alcohol and Other Drugs (ESPAD 2011) (Hibell et al., 2012) referring to possible problems associated with alcohol consumption; (5) a fifth block of questions of our own design (based upon the ESTUDES and ESPAD surveys), referring to variables associated with BD highlighted in literature, such as curfew, allowance money, beliefs and expectancies, consumption by family members or peers; and, finally, information referring to sociodemographic variables, such as gender, age, ownership of the school, residential area or parents' level of education.

Procedure

Data was collected in the classroom, in small groups (between 15-20 individuals), using a survey to be completed individually. Data was collected by a team of psychologists experienced in these types of tasks. Each subject was informed of the purpose of the study, confidentiality and anonymity of the responses. Consent and collaboration was granted by both the directors of the educational centres, as well as of the respective students' parent associations. Participation was completely voluntary and completion of the questionnaire required approximately 20 minutes. The study was also approved by the Bioethics Committee of the University of Santiago de Compostela.

Data analysis

A total of 3,714 questionnaires were collected. Filtering of the initial database resulted in the elimination of 295 cases, either for an excessive amount of blank values (15), an incoherent response pattern (22) or due to an age outside of the established range (12-18 years) (258). The differences between binge drinkers and non-binge drinkers underwent bivariate analysis, applying suitable comparisons, depending on the nature of the variables: Student's *t* tests for comparing means and eta squared (η^2) coefficients to calculate the effect size of quantitative variables, as well as χ^2 comparisons to compare percentages and phi (ϕ) coefficients and contingency coefficients (CC) to calculate the effect size of qualitative variables. The IBM SPSS Statistics 20 package was used for data analysis.

Results

An initial interesting fact reflected in Table 1 is that 6 out of every 10 adolescents between 12-18 years of age have consumed alcohol in the last year (58.7%). With regards to BD, it is worth highlighting that 24.5% have consumed 6 or more alcoholic drinks during a single drinking episode in the last year, a figure that drops to 12.8% if referring to the last month. Nevertheless, when evaluating BD as the consumption of 3 or more alcoholic drinks during a single drinking episode, the percentage of drinkers in the last year

and in the last month doubles (41.8% and 25%, respectively). Likewise, 34.4% of adolescents claim to have gotten drunk in the last year and 16.5% claim this in the last 30 days. To facilitate comparison of the data obtained by this study with that of ESTUDES 2014-2015 (which interviewed students between the ages of 14-18 years only), Table 1 presents the data specifically for that age group. As shown, the percentages are considerably greater than in the case of the global sample (which also included the age range of 12-13 years), but similar to those of ESTUDES, where 22.2% of the subjects had gotten drunk in the last 30 days.

The results also show (Table 2) the existence of significant differences in the percentage of boys and girls that indulged in BD in the last year and in the last month, with higher percentages for boys, especially in the case of consumption of 6 or more alcoholic beverages. Similarly, results show that BD increases significantly with age, with percentages of up to 20 and 30 times greater in the age range of 16-18 years, compared with the age range of 12-13 years. For purposes of knowing which group comparisons resulted in significant differences, the groups were compared two at a time; the table marks (with the corresponding superscripts) those cases in which differences were significant. Results obtained revealed the existence of significant differences between the three age groups, and noticeably greater between the groups on the ends (12-13 vs. 16-18) (Table 2).

Likewise, the data also revealed statistically significant differences depending on the ownership of the school, with higher rates in public schools. With regards to the residential setting, adolescents residing in urban settings show higher rates of BD. Finally, prevalence rates are proven to increase significantly as the parents' level of education decreases, with the greatest differences appearing in the consumption of 3 or more alcoholic drinks over the last year. Last of all, as performed with ages, comparisons were also done between two groups at a time, for purposes of knowing which group comparisons resulted in significant differences. Table 2 shows that significant differences are obtained practically between all groups, except between adolescents with parents having primary and secondary education levels, when analysing the consumption of 3 or more alcoholic drinks and drunkenness.

Table 1. Prevalence of BD in Galicia.

	12-18 years		14-18 years	
	Last year	Last month	Last year	Last month
Alcohol	58.7%	37.9%	73.4	49.7
3 or more alcoholic drinks	41.8%	25%	55.1%	33.9%
6 or more alcoholic drinks	24.5%	12.8%	33%	17.2%
Getting drunk	34.4%	16.5%	46%	22.4%

Associated risks

As per the results of Table 3, adolescents that have indulged in BD in the last year are significantly more involved in all of the risky behaviour types considered, especially in the case of fights, accidents or injuries and unprotected sex. When considering the phi coefficients, it is worth mentioning that those adolescents who consume 6 or more alcoholic drinks present the highest risk of suffering all of these types of consequences. Likewise, the existence of statistically significant differences between binge drinkers vs. non-binge drinkers have been corroborated with regards to the consumption of other substances, particularly tobacco and cannabis (Table 4).

No less interesting is the verification that the percentage of adolescents that could be involved in hazardous alcohol consumption, specifically evaluated by AUDIT, increases

significantly among binge drinkers. Again, the highest percentages are obtained among those who had consumed 6 or more alcoholic drinks in the last year (81.3%), followed by those who had gotten drunk (66%) and by those who had consumed 3 or more alcoholic drinks (58.5%), with a 25.7% ($\chi^2 = 1560.73$; $p < .001$) rate of positives in AUDIT for the global sample.

Possible predictive factors

As reflected in Table 5, statistically significant differences have been found in practically all of the beliefs studied, demonstrating that those who indulged in BD in the last year in any of its forms overrated the positive effects of alcohol (especially, “have a lot of fun”, “feel happy” and “feel outgoing and extroverted”), while they also underrate

Table 2. Differences in BD according to sociodemographic variables.

Gender	Last year				Last month					
	Boys (%)	Girls (%)	χ^2	ϕ	Boys (%)	Girls (%)	χ^2	ϕ		
3 or more alcoholic drinks	42.8	40.6	1.34	.02	26.8	22.8	6*	.05		
6 or more alcoholic drinks	29.2	19.2	38.65**	.12	16	9.2	29.47**	.10		
Getting drunk	36	32.5	3.89*	.04	18.2	14.6	6.63*	.05		
Age Group	12-13 years ¹ (%)	14-15 years ² (%)	16-18 years ³ (%)	χ^2	CC	12-13 years ¹ (%)	14-15 years ² (%)	16-18 years ³ (%)	χ^2	CC
3 or more alcoholic drinks	5.1 ^{2,3}	32.5 ^{1,3}	72.1 ^{1,2}	926.62**	.49	1.3 ^{2,3}	14.4 ^{1,3}	48.7 ^{1,2}	642.43**	.43
6 or more alcoholic drinks	1.3 ^{2,3}	15.5 ^{1,3}	46.2 ^{1,2}	577.95**	.41	0.8 ^{2,3}	6.3 ^{1,3}	25.4 ^{1,2}	307.90**	.31
Getting drunk	2.9 ^{2,3}	25.4 ^{1,3}	61.6 ^{1,2}	775.26**	.46	0.5 ^{2,3}	9.2 ^{1,3}	32.4 ^{1,2}	398.63**	.35
Ownership	Public (%)	Private (%)	χ^2	ϕ	Public (%)	Private (%)	χ^2	ϕ		
3 or more alcoholic drinks	45.4	33.7	34.75**	.11	27.9	18.7	27.64**	.10		
6 or more alcoholic drinks	27.3	18.4	26.26**	.10	14.9	8.1	25.27**	.09		
Getting drunk	37.4	28	23.90**	.09	17.7	13.7	6.97*	.05		
Setting	Rural (%)	Urban (%)	χ^2	ϕ	Rural (%)	Urban (%)	χ^2	ϕ		
3 or more alcoholic drinks	38	44.5	12.02**	.07	22.9	26.6	4.79*	.04		
6 or more alcoholic drinks	21.9	26.5	7.97*	.05	11	14.2	6.04*	.05		
Getting drunk	30.7	37.2	13.30**	.07	13.9	18.4	9.75*	.06		
Parents' Education	Primary ¹ (%) ^a	Secondary ² (%) ^b	Higher ³ (%) ^c	χ^2	CC	Primary ¹ (%)	Secondary ² (%)	Higher ³ (%)	χ^2	CC
3 or more alcoholic drinks	48.9 ³	46.2 ³	33.5 ^{1,2}	52.01**	.14	30.5 ³	28.5 ³	18.5 ^{1,2}	40.40**	.12
6 or more alcoholic drinks	30.6 ^{2,3}	26.1 ^{1,3}	19.5 ^{1,2}	29.13**	.10	18.1 ^{2,3}	14 ^{1,3}	8.6 ^{1,2}	34.75**	.11
Getting drunk	40.3 ³	38 ³	27.8 ^{1,2}	37.27**	.11	20.1 ³	19.6 ³	11.6 ^{1,2}	30.80**	.11

Note. 1,2,3 Groups with which significant differences have been found ($p < .05$). a: Both have primary education or have not completed primary studies; b: At least one has secondary level education; c: At least one has completed university studies. * $p < .05$

ted the negative effects (especially “have problems with the police”, “being unable to stop drinking” or “detrimental to health”). As regards curfew, the analyses completed reveal that the later the time an adolescent comes home after going out, the higher the BD rate (Table 6). Likewise, BD percentages increase as allowance money increases.

Concerning consumption by family members, the results shown in Table 7 reveal that when parents drink alcohol regularly, adolescents also obtain higher BD rates. However, the greatest differences are observed when siblings drink alcohol. Last of all, as detailed in Table 8, a significantly higher percentage of adolescents indulge in BD when their peers also drink alcohol, get drunk, smoke tobacco or use other drugs.

Discussion

Despite the fact that the results of the most recent *National Survey on Drug Use among Secondary School Students (ESTUDES 2014-2015)* (National Drug Plan, 2016) reveal a considerable decrease in the consumption of alcohol among students, prevalence rates continue to be high, especially with regards to BD. Given that the age at onset of consumption of alcohol and other substances is increasingly younger, this study opted for expanding the sample to include the ages of 12-18 years, motivated by the extensive literature warning of the serious consequences of this consumption pattern at very young ages (Ellickson, Tucker & Klein, 2003; Motos et al., 2015; Stueve & O'Donnell, 2005). The results obtained reveal that BD is a common, genera-

Table 3. Risk practices (last 12 months).

	3 or more alcoholic drinks		χ^2	ϕ	6 or more alcoholic drinks		χ^2	ϕ	Getting drunk		χ^2	ϕ
	Yes (%)	No (%)			Yes (%)	No (%)			Yes (%)	No (%)		
	Fights	26			2.7	355.20**			.35	35.8		
Accidents or injuries	16.7	1.6	221.87**	.28	22.8	3	291.40**	.32	19.5	1.8	281.41**	.31
Problems with parents	10.9	1.1	140.43**	.22	13.7	2.4	138.78**	.22	12.2	1.5	151.95**	.23
Lower academic performance	9	0.8	115.75**	.20	11.9	1.7	135.96**	.22	10.5	0.9	147.71**	.23
Victim of theft/robbery	3.9	0.3	50.99**	.13	5	0.8	52.91**	.14	4.4	0.4	57.04**	.14
Problems with police	8.1	0.8	103.61**	.19	11.6	1.4	147.15**	.23	9.8	0.7	145.09**	.22
Seeking emergency room treatment/hospitalisation	5.6	0.8	57.56**	.14	8.3	1.1	96.31**	.18	6.9	0.8	85.99**	.17
Unprotected sex	14.5	0.8	217.39**	.27	21	1.9	319.85**	.33	17.2	0.9	286.57**	.31
Sex you later regretted	13.1	0.6	198.52**	.26	19.6	1.4	318.87**	.33	15.3	0.9	243.67**	.29
Riding with a driver under the effects of alcohol	43.4	18.9	206.87**	.27	51.9	21.7	237.65**	.29	46.8	19.7	233.90**	.28
Driving under the effects of alcohol	7.5	0.4	107.87**	.19	11.3	0.9	173.28**	.25	9.1	0.3	157.10	.24

Note. * $p < .05$. ** $p < .001$.

Table 4. Use of other substances (last 12 months).

	3 or more alcoholic drinks		χ^2	ϕ	6 or more alcoholic drinks		χ^2	ϕ	Getting drunk		χ^2	ϕ
	Yes (%)	No (%)			Yes (%)	No (%)			Yes (%)	No (%)		
	Tobacco	62.5			7.5	1017.20**			.59	72.2		
Marihuana or hash	41.3	2.9	681.91**	.48	53.7	7.7	739.71**	.50	47.8	3.6	838.36**	.54
Cocaine	3.9	0.1	59.65**	.15	6.2	0.3	104.43**	.19	4.7	0.1	81.27**	.17
Ecstasy, amphetamines or hallucinogens	5.7	0.1	91.44**	.18	8.8	0.4	159.76**	.24	6.5	0.2	113.14**	.20

Note. * $p < .05$. ** $p < .001$.

lised practice (between 24.5% and 41.8% of adolescents in Galicia). Even though the percentages found in the younger age group are low (1.3% for the consumption of 6 or more alcoholic drinks in the last year, 2.9% for getting drunk and 5.1% for the consumption of 3 or more alcoholic drinks), extrapolating these figures to the population means that between 500 and 2,000 children between the ages of 12-13 years in the community of Galicia admit having indulged in BD in the last year.

In addition to estimating the prevalence of BD, this empirical study has also sought to obtain new evidence of the seriousness of this practice on different levels. In alignment with many studies found in literature that relate BD with many negative consequences and risk practices (Miller

et al., 2007; Wechsler et al., 1994), it is also observed that adolescents with this consumption pattern are significantly more involved in all of the risky behaviour types considered. In addition, confirmation is also obtained of the trend observed by other authors (Chassin, Pitts & Prost, 2002; Jones et al., 2001) in which adolescents that indulge in BD show a higher probability of initiating the consumption of other substances, as well as of developing risky consumption practices (as revealed by AUDIT) or even of a possible disorder or dependence in adulthood (Norström & Pape, 2012; Viner & Taylor, 2007). From a comparative perspective, of the three patterns analysed, those with the most intense consumption (6 or more alcoholic drinks) show the highest probability of becoming involved in the different

Table 5. Beliefs and expectancies.

	3 or more alcoholic drinks		t	η²	6 or more alcoholic drinks		t	η²	Getting drunk		t	η²
	Yes (M)	No (M)			Yes (M)	No (M)			Yes (M)	No (M)		
Feel relaxed	2.13	1.48	-14.33**	.26	2.18	1.61	-11.08**	.20	2.14	1.55	-12.49**	.23
Problems with police	1.33	2.22	17.30**	.30	1.30	2.02	12.65**	.22	1.31	2.13	15.49**	.27
Harm my health	2.52	3.07	11.14**	.20	2.50	2.95	7.93**	.15	2.53	3	9.17**	.17
Feel happy	2.64	1.64	-22.47**	.38	2.75	1.83	-18.77**	.30	2.72	1.72	-22.31**	.37
Forget about my problems	2.51	1.95	-11.21**	.21	2.63	2.03	-10.92**	.19	2.59	1.97	-12.20**	.22
Cannot stop drinking	1.31	2.12	16.31**	.28	1.41	1.90	8.78**	.15	1.32	2.03	13.80**	.24
Have a hangover	2.62	2.80	3.61**	.07	2.69	2.73	0.73	.01	2.69	2.74	1.02	.02
Feel sociable and extroverted	2.74	1.90	-18.01**	.31	2.81	2.07	-14.26**	.24	2.80	1.96	-17.70**	.30
Do something I'll later regret	2.25	2.73	9.59**	.18	2.35	2.59	4.33**	.08	2.33	2.64	6.25**	.11
Have a lot of fun	2.93	1.83	-25.79**	.42	3.08	2.02	-23.34**	.36	3.03	1.90	-26.63**	.42
Feel ill	2.18	2.86	13.90**	.25	2.10	2.73	11.67**	.20	2.16	2.79	12.81**	.22

Note. *p < .05. **p < .001.

Table 6. Curfew and allowance money.

	3 or more alcoholic drinks		χ²	CC	6 or more alcoholic drinks		χ²	CC	Getting drunk		χ²	CC	
	Yes (%)	No (%)			Yes (%)	No (%)			Yes (%)	No (%)			
Curfew	Before midnight	5.4	94.6	865.30**	.52	2.1	97.9	672.94**	.47	3.8	96.2	775.42**	.50
	Between midnight-2 a.m.	26.2	73.8			8.9	91.1			17	83		
	Between 2-4 a.m.	58.3	41.7			26.8	73.2			45.1	54.9		
	Between 4-6 a.m.	84	16			57.7	42.3			73.5	26.5		
	Later than 6 a.m.	92.1	7.9			77	23			88.1	11.9		
Allowance money	0€	22.4	77.6	294.99**	.33	11.8	88.2	268.82**	.32	19.7	80.3	195.22**	.28
	Up to €10	31.1	68.9			14.6	85.4			26.1	73.9		
	Between €11-20	52	48			27.8	72.2			42.9	57.1		
	Between €21-30	70	30			46.4	53.6			54	46		
	Over €30	82.3	17.7			62.1	37.9			70	30		

Note. *p < .05. **p < .001.

Table 7. Consumption of alcohol by family members.

Alcohol use		3 or more alcoholic drinks		χ^2	ϕ	6 or more alcoholic drinks		χ^2	Φ	Getting drunk		χ^2	ϕ
		Yes (%)	No (%)			Yes (%)	No (%)			Yes (%)	No (%)		
Mother	Almost never	40.5	59.5	4.58*	.04	23.2	76.8	5.03*	.04	33.2	66.8	3.70	.04
	Regularly	44.8	55.2			27.2	72.8			37	63		
Father	Almost never	36	64	28.86**	.10	20.2	79.8	20.80**	.09	30.1	69.9	16.67**	.08
	Regularly	46.1	53.9			27.6	72.4			37.4	62.6		
Siblings	Almost never	32.6	67.4	168.48**	.26	18	82	112.90**	.21	26.4	73.6	137.91**	.24
	Regularly	59.3	40.7			37.2	62.8			49.8	50.2		

Note. * $p < .05$. ** $p < .001$.

Table 8. Use of alcohol and other substances among peers.

		3 or more alcoholic drinks		χ^2	CC	6 or more alcoholic drinks		χ^2	CC	Getting drunk		χ^2	CC
		Yes (%)	No (%)			Yes (%)	No (%)			Yes (%)	No (%)		
They drink alcohol	None	1.4	98.6	1231.17**	.54	0.3	99.7	776.57**	.46	0.5	99.5	1033.93**	.51
	A few	11.1	88.9			5	95			9.5	90.5		
	Some of them	35.9	64.1			14.7	85.3			23.7	76.3		
	The majority	71.6	28.4			43.1	56.9			61.1	38.9		
	All of them	90.4	9.6			66.9	33.1			79.8	20.2		
They get drunk	None	3.9	96.1	1009.38**	.51	1	99	719.15**	.44	1	99	1042.63**	.51
	A few	31.7	68.3			13.1	86.9			20.7	79.3		
	Some of them	60.2	39.8			32.1	67.9			46.8	53.2		
	The majority	74.1	25.9			51.8	48.2			71	29		
They use tobacco	All of them	94.2	5.8	749.53**	.45	75	25	545.69**	.40	92.5	7.5	715.76**	.44
	None	7.4	92.6			2.2	97.8			4.5	95.5		
	A few	37.6	62.4			16.6	83.4			27	73		
	Some of them	59.8	40.2			36.9	63.1			50.1	49.9		
They use other drugs	The majority	72.5	27.5	581.05**	.41	50.4	49.6	489.20**	.38	66.6	33.4	670.06**	.43
	All of them	86.4	13.6			67.2	32.8			84.4	15.6		
	None	22.8	77.2			10.4	89.6			15.4	84.6		
	A few	58.1	41.9			33	67			48.6	51.4		
	Some of them	71.2	28.8			49.9	50.1			64.7	35.3		
	The majority	81	19	82.1	17.9	58.2	41.8	91.9	8.1	81.1	18.9		
	All of them	89.5	10.5			82.1	17.9			91.9	8.1		

Note. * $p < .05$. ** $p < .001$.

risky behaviours considered. Nevertheless, those who get drunk show similar levels of polydrug use.

In terms of prevention, the development of an efficient response requires the identification of some of the variables associated with BD. In this regard, results confirm that BD adolescents have clearly positive beliefs and expectancies about the effects of alcohol, much more so (comparatively) than those with a more moderate consumption, in

line with the hypotheses of Cortés et al. (2007) and McBride et al. (2014). Furthermore, the consumption of alcohol and of other substances by peers has proven to be a variable that is closely related to BD. According to Kandel and Andrews (1987), imitating the behaviour of peers is the predominant form of social influence, favouring the choice of friends that reinforce these types of behaviours. The same is true with regards to the influence of consumption

by family members, coherent with social learning theory, which underlines the importance of the subject's identification with the model (Espada et al., 2008). Another two variables that count with lesser empirical evidence in literature are curfew and allowance money. Though previous studies have also related both to the consumption of alcohol (Humensky, 2010; National Drug Plan, 2014; Varela et al., 2013), this study has found that they are also related to BD.

In sociodemographic terms, despite the fact that this pattern could be considered, today, a generalised phenomenon, it is possible to identify a profile with a higher prevalence of BD. Specifically, the percentages found are significantly greater among boys between the ages of 16-18, in urban settings, attending public schools, and among those whose parents have a low level of education.

If we attempt to integrate all of the information referring to those variables that are considered as possible "precedents", in addition to the aforementioned sociodemographic profile, the existence of a pattern associated with BD is worth mentioning, basically defined by beliefs and expectancies (adolescents who tend to overly attribute positive effects to BD), high consumption by peers (not only of alcohol, but also of tobacco and other substances), later curfew (especially after 4 a.m.), greater monetary allowance when going out (especially over €30), and high consumption by family members, especially on behalf of siblings. The available information does not allow for rigorously establishing significant differences among the three BD groups considered, though the variables analysed altogether seem to have a greater capacity for explaining or predicting a more "moderate" consumption pattern (3 or more alcoholic drinks), than for explaining a more "severe" pattern (6 or more alcoholic drinks).

Last of all, as to the possible limitations of this study worth mentioning are, first, the lack of consensus when operationalising BD as the variable object of the study. The absence of a definition of a Standard Drink Unit (SDU) or the lack of specificity of the time period considered "a single drinking episode" makes obtaining a precise measure of BD, comparable with other countries, a truly difficult task. To attempt to attenuate these types of difficulties, this study has opted for using 3 complementary indicators, two quantitative ("having consumed 3 or more alcoholic drinks during a single drinking episode" and "having consumed 6 or more alcoholic drinks during a single drinking episode") and another more qualitative or subjective indicator ("got drunk"). This has also provided some clues as to how the individual's subjective perception is related to the objective amount of consumption. A repetitive result in each of the questions explored by this study is that the figures associated with the behaviour of drunkenness are always positioned midway between the consumption of 3 or more alcohol drinks and the consumption of 6 or

more alcohol drinks. It would be worth asking, therefore, if it would be more suitable to operationalise BD as the consumption of 4 or 5 alcoholic drinks during a single drinking episode, given that this seems to better align with the subjective perception of having got drunk. Another option, perhaps more suitable for rigorously operationalising BD could be to identify a series of indicators that includes both the objective number of amount of alcoholic drinks consumed as well as the individual's own perception, somehow attempting to develop (and empirically validate) a brief BD scale. It is important to point out that the sample of 3,419 adolescents may, to a certain extent, be considered representative of the autonomous region of Galicia, but its extrapolation to other communities is questionable. Last of all, it is also important to advise that this study is exploratory and, therefore, does not allow for establishing causal relationships. Though it is conceptually possible to anticipate which variables might be acting as predictors or consequences of BD, only a longitudinal design could confirm causal relationships.

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Conflict of interests

The authors declare the inexistence of conflicts of interest.

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