Alcohol Consumption among Adolescents and the Information Paradox

Consumo de alcohol entre adolescentes y la paradoja de la información

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Keywords

Adolescence
- Substance Use
- Alcohol Consumption
- Gender
- Health

Abstract

Alcohol is the neurotoxic substance that is most frequently consumed by adolescents. Thus, it is a highly relevant topic in the sociology of health given the negative consequences at this stage of development. This study, based on a survey of 1307 adolescents aged 15 to 18 in Tarragona, analyzes individual, environmental and informational factors influencing three types of alcohol consumption. Age and peer influence are found to increase the likelihood of consumption, although gender does not. Contrary to expectations, those adolescents who believe that they are better informed about the effects of consumption do not display lower consumption rates, suggesting an "information paradox". Furthermore, it was found that information from friends facilitates consumption, whereas information from formal sources, such as the media, inhibits said consumption.

Palabras clave

Adolescencia
- Consumo de sustancias
- Consumo de alcohol
- Género
- Salud

Resumen

El alcohol es la sustancia neurotóxica más consumida por los adolescentes. Así, se trata de un tema relevante en la sociología de la salud debido a las consecuencias negativas en esta etapa de formación. Este estudio, basado en una encuesta a 1307 adolescentes de quince a dieciocho años en Tarragona, analiza factores individuales, ambientales e informativos que influyen en tres modalidades de consumo de alcohol. La edad y la influencia de los pares aumentan la probabilidad de consumo, pero no el género. Contrario a lo esperado, aquellos adolescentes que se sienten mejor informados sobre los efectos del consumo no presentan menores tasas de consumo, revelando una «paradoja de la información». Además, se encontró que la información de amigos facilita el consumo, mientras que la información de fuentes formales, como medios de comunicación, inhibe dicho consumo.

Citation

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INTRODUCTION[1]

Adolescence is a crucial phase in the development of individuals, during which alcohol consumption becomes a problem, according to the State Survey on Drug Use in Secondary Education (OEDA, 2022; Leal-López, 2021a). During this period, the neurotoxic effects of alcohol may have serious health consequences, causing physical problems (Wellman, Sabiston and Morgenstern, 2022), alterations in brain development and neurocognitive difficulties (Tong *et al*., 2022). Furthermore, it may lead to a decline in academic performance, high-risk sexual behavior, accidents (Cabrera *et al*., 2022) and peer harassment behavior (Prignitz *et al*., 2023). These findings justify the classification of alcohol abuse as one of the main threats to adolescent environmental health (Ortega-García *et al*., 2019).

Although alcohol consumption by youth has demonstrated a downward trend since the late 20th century, both in Spain (OEDA, 2022) and internationally (Gual and Colom, 1997; Leal-López *et al*., 2021b), alcohol continues to be the most frequently consumed psycho-active substance by adolescents (OEDA, 2022). According to data from the Spanish Observatory on Drugs and Addictions, 54.1 % of all sixteen year old students have experienced alcohol poisoning; almost three out of ten have engaged in *binge drinking*[2] over the past month; and 20.8 % have gotten drunk during this same period (OEDA, 2023), with weekend consumption being especially intensive (Calafat *et al*., 2005; Cortés, Espejo and Giménez, 2007; Sánchez-Quejica *et al*., 2015).

During the adolescent period, social acceptance and environmental availability of alcohol favor access to its consumption (Sánchez-Aragón *et al*., 2024). For this reason, over recent years, the implementation of preventive strategies has intensified, many of which focus on informing adolescents about the risks of drug abuse through school programs (Suárez *et al*., 2014). In fact, 29.6 % of the students affirm that they are fully informed about drug consumption (OEDA, 2023). This information, however, has not led to lower consumption rates, a phenomenon that has been labelled by some authors as "the information paradox" (Belzunegui-Eraso *et al*., 2020).

Currently, little is known regarding how information acts on substance use. Therefore, the objective of this work is to observe the effects of information sources used by adolescents on alcohol consumption and its most extreme forms. At the same time, it is interesting to determine how the influence of certain individual and contextual variables on consumption is modulated, once the sources of information have been introduced.

[2] Spain's National Plan on Drugs defines *binge drinking* as the consumption of five or more alcoholic drinks (in the case of men) or four or more (in the case of women) within a short period of time, usually around two hours.

Some factors associated with alcohol consumption

Scientific literature has suggested that substance use should be understood by considering the ecological context in which adolescents are socialized, taking into account both the social groups to which they belong and the influence of these on their beliefs, values and attitudes (Pons and Buelga, 2011). This approach examines the role of risk factors and protection factors.

Studies analyzing the influence of socialization agents have confirmed the role played (at a microsocial level) by the family on the minor's relationship with psychoactive substances. Evidence suggests that a lack of parental control, permissiveness in education and inconsistency in establishing standards are factors that increase the likelihood of drug use (Jiménez-Iglesias *et al*., 2013; Cruz-Salmerón *et al*., 2011). Specifically, a lack of adequate parental supervision has been associated with increased substance use (Guo *et al*., 2011; Perelló, Llorens, and Tortajada, 2008). Therefore, both a neglectful parenting style as well as an authoritarian approach, characterized by rigid and arbitrary rules, act as risk factors (Mehanović *et al*., 2022; Berge *et al*., 2016). In contrast, a caring and democratic parenting style acts as a protective factor (Novak, Maglica and Radetic Paic, 2022; Fuentes *et al*., 2015; Wray-Lake, Crouter and McHale, 2010).

Parental behavior regarding substance use also has a significant influence. Evidence shows that adolescents who grow up in homes where drugs are used tend to develop a more favorable attitude toward them and a lower perception of risk, thus increasing their likelihood of using drugs (Obradors-Rial, Ariza and Muntaner, 2014; Urrutia-Pereira *et al*., 2019).

Although the family model has a prominent influence in early adolescence (Brown, 2008), the group of friends becomes the main influencing factor in alcohol consumption (Helmer *et al*., 2021; Neighbors *et al*., 2016). In Spain, according to data from the national survey on drug use in young people, 80.4 % of the students whose friends (all or the majority) drank alcoholic beverages during the past thirty days had also consumed alcohol during this period. In contrast, only 39.6 % of those students in groups with few or no friends who drink alcohol reported drinking it themselves (OEDA, 2022).

Friendships are crucial for the initiation and maintenance of drug use, since sharing these habits facilitates social integration and decreases the risk of rejection (Gommans *et al*., 2017; Calero *et al*., 2022). There are diverse reasons for drinking: disconnecting from everyday problems, relaxing (Smit *et al*., 2022; Patrick *et al*., 2024) or, in other cases, escaping from emotions such as stress, anxiety, sadness, nervousness or loneliness (Cano *et al*., 2012).

Of the personality characteristics, young people presenting traits such as emotional instability, low self-esteem, impulsiveness or low tolerance to frustration are more vulnerable to consumption (Melguizo-Ibáñez *et al*., 2023). These adolescents are often intolerant to boredom and demonstrate a constant need for stimuli, leading them to seek out new and riskier experiences (Pérez de Albéniz-Garrote, Medina-Gómez and Rubio-Rubio, 2019). Other factors playing a significant role in substance use are irritability and the questioning of social norms. Irritability is bidirectionally related to alcohol use, since increased irritability may facilitate consumption and, in turn, alcohol consumption may trigger irritable behaviors (Nawi *et al*., 2021). In addition, the tendency to

question the rules, including those regarding drug consumption, may facilitate the initiation of consumption (Bousoño *et al*., 2021). Similarly, alcohol consumption may encourage antisocial behavior, creating a cycle of mutual influence (Cabrera *et al*., 2022; Prignitz *et al*., 2023).

Religious practices influence adolescents' behaviors and attitudes, promoting healthy lifestyles and strengthening resistance to risky behaviors (Afifi *et al*., 2020; Andrés-Sánchez and Belzunegui-Eraso, 2022). In studies focused on Spain, strict rules prohibiting the use of alcohol explain the special capacity of the Islamic religion to protect against its consumption (Charro-Baena *et al.,* 2019). As for sex, the ESTUDES survey (OEDA, 2023) revealed the growing tendency of girls to be included in legal drug consumption, exceeding boys in alcohol consumption. One illustrative fact is the participation of girls in the practice of *botellón* (drinking in street parties) in percentages exceeding that of boys (OEDA, 2023).

Along with these individual factors, risk perception also plays a crucial role in the initiation of substance use. In general, when young people perceive that the associated risk is low, the likelihood of consumption increases (OEDA, 2023). Although adolescents receive numerous messages about the negative effects of drug use, such as addiction and dependence, through various channels, a carefree attitude often prevails. This is related to what is referred to as the "illusion of invulnerability", a characteristic of adolescent thought (Mietzel, 2005). This is a type of perception of reality that leads the individual to believe that the negative consequences of substance use can only occur to others (Lapsley and Hill, 2010). Some studies suggest that this belief contributes to the fact that, despite being informed, adolescents continue to consume substances (Pons and Buelga, 2011), which has been called the "information paradox" (Belzunegui-Eraso *et al*., 2020), as previously mentioned.

According to the data collected in the ESTUDES survey (OEDA, 2022), amongst the drug consumption behaviors that students aged 14-18 associated with a lower risk were drinking 5 or 6 beers or glasses of alcoholic beverages on the weekend (56.5 %). Legally sold drugs (alcohol, tobacco and hypnotics/sedatives) are perceived as being less dangerous than illegal substances other than cannabis. In all consumer practices, with a few exceptions, the perception of risk increases with age, with the feeling of danger being greatest in the eighteen-year age group. Some studies have also found significant differences based on personal consumption, with alcohol consumers perceiving it as less dangerous than non-consumers (Salamó-Avellaneda, Gras-Pérez and Font-Mayolas, 2010).

García del Castillo, García del Castillo-López and López-Sánchez (2014) drew attention to the fact that the information received by young people about alcohol consumption is often contradictory. On the one hand, publicity campaigns associate alcohol consumption with pleasant experiences, accompanied by the message "enjoy with responsible consumption", which seeks to promote moderate consumption. On the other hand, prevention programs in schools often focus on messages based on appeals to fear. Musitu (2014) argued that the preventive discourse on the harms of alcohol clashes with the so-called "vitalistic presenteeism" that characterizes adolescents (Megías *et al*., 2006). On the other hand, taking a more generic approach, Martínez-Oró and Romaní (2016) criticized the prohibitionist orientation that has led to the stigmatization of consumers with unintended consequences, including discrimination.

MATERIALS AND METHODS

Design and sample

Cross-sectional and correlational study based on a questionnaire administered to secondary school students in Tarragona, whose demographic characteristics are presented in Table 1. The survey was conducted in February-March of 2023 and was addressed to adolescents in the final course year of compulsory secondary education, baccalaureate studies or in professional training courses. The questionnaire was completed online under supervision. The sample size was N=1307 and the margin of error was 2.6 %. It was found that 46.5 % of the responses corresponded to girls and 51.2 % to boys, aged between fifteen and eighteen years (2.3 % did not respond). The mean age was 16.4 (SD=0.96).

Hypothesis

Three specific hypotheses were formulated:

H_1 affirms the existence of statistically significant differences in alcohol consumption, depending on the age and sex of the adolescents.

H_2 expresses that the influence of peers stands out as a risk factor for alcohol consumption and its most intensive forms.

H_3 considers that information on substance use based mainly on unsupervised sources is a facilitator of alcohol consumption.

Data analysis

Definition of the variables and the measures

The dependent variables of this study are the modalities of alcohol consumption (see List 1).

The explanatory factors were defined from variables classified as individual (sex, age, normative conformity and irritability), environmental (school, family and friends) and information (perception of information quality and source of information) variables (see List 2). Table 1 shows the frequencies of the items included in these constructs.

Statistical analysis

In an initial step, the reliability of the scales with two factors was measured: IRRITABILITY, SCHOOL SUPPORT, CONTROL_P and INFL_PEERS. Conventional measures were used, such as Cronbach's alpha (α),

LIST 1. *Dependent variables in the analysis*

Name of the dependent variable	Description of the variable	Response categories
CONSUMPTION	Number of times consuming alcohol over the past 30 days.	0="Never", 1="Once or twice", 2="3 to 9 times", 3="Between 10 and 20 times" and 4="More than 20 times".
DRUNKENNESS	Number of times that the adolescent declares to have gotten drunk over the past 30 days.	*Idem* to CONSUMPTION
BINGE DRINKING (BINGE)	Number of times that the adolescent declares to have consumed alcohol in the *binge drinking* modality over the past 30 days.	*Idem* to CONSUMPTION

Source: Author's own creation.

composite reliability (CR), average variance extracted (AVE) and the factorial loads of the indicators for each latent variable. The scales are considered reliable if α and CV > 0.7, AVE > 0.5, and the factorial loads are less than 0.6.

Subsequently, a correlation analysis was performed between the alcohol con-

LIST 2. *Independent variables in the analysis*

Name of the independent variable	Description of the variable	Response categories
SEX	Sex of the interviewed person	1="Girl"; 0="Boy"; 2="Prefer not to respond".
AGE	Age in years	Re-coded as: 1="17 or older"; 0="Under 17".
CU_RULES (Rule compliance)	CU_RULES_1: the majority of the rules can be broken if they are inconvenient. CU_RULES_2: I follow the rules I want to follow. CU_RULES_3: it is hard to trust something because everything changes. CU_RULES_4: in fact, no one knows what is expected of him/her in life. CU_RULES_5: you cannot be sure of anything in life. CU_RULES_6: sometimes, it is necessary to break the rules to be successful. CU_RULES_7: following the rules does not guarantee success.	1="Totally disagree"; 2="Strongly disagree"; 3="Neither agree nor disagree"; 4="Strongly agree"; 5="Totally agree".
IRRITABILITY	IRRITABILITY_1: I have become easily annoyed or irritated. IRRITABILITY_2: I have had outbursts of anger that I have not been able to control. IRRITABILITY_3: I have wanted to break or damage things. IRRITABILITY_4: I have fought with someone. IRRITABILITY_5: I have yelled or thrown things at someone.	1="Almost never"; 2="Rarely"; 3="Sometimes"; 4="Often"; 5="Almost always".
SUPPORT_SCHOOL (Support from the school)	SUPPORT_SCHOOL_1: adults at my school care about me. SUPPORT_SCHOOL_2: I have friends at my school who care about me. SUPPORT_SCHOOL_3: students at my school are friendly to one another. SUPPORT_SCHOOL_4: my school helps me to achieve the objectives that I care about. SUPPORT_SCHOOL_5: I like to participate in activities at my school.	1="Totally disagree"; 2=" Strongly disagree"; 3="Neither agree nor disagree"; 4="Strongly agree"; 5="Totally agree".

LIST 2. *Independent variables in the analysis* (Continuation)

Name of the independent variable	Description of the variable	Response categories
CONTROL_P (Parental control)	My parents… CONTROL_P_1: they think it is very important that my studies go well. CONTROL_P_2: they establish clear rules about what I can do at home. CONTROL_P_3: they establish clear rules about what I can do outside of my house. CONTROL_P_4: they establish clear rules about when I have to be home at night. CONTROL_P_5: they know who I am with at night. CONTROL_P_6: they know where I am at night. CONTROL_P_7: they know my friends. CONTROL_P_8: they know the parents of my friends.	1="Does not apply to me at all"; 2="Does not apply well to me"; 3="Applies to me a good deal"; 4="Applies very well to me".
INFL_PEERS (Peer influence)	INFL_PEERS_1: sometimes it is necessary to smoke cigarettes so that I am not left out of my group of peers. INFL_PEERS_2: sometimes it is necessary to drink alcohol to avoid being left out of my peer group. INFL_PEERS_3: sometimes it is necessary to smoke weed to avoid being left out of my peer group. INFL_PEERS_4: sometimes it is necessary to skip class to avoid being left out of my peer group.	1="Totally disagree"; 2="Strongly disagree"; 3="Neither agree nor disagree"; 4="Strongly agree"; 5="Totally agree".
Religious affiliation	Identification with a certain religion or with none.	1="Catholic"; 2="Evangelical"; 3="Muslim"; 4="Orthodox"; 5="Other religion"; 6="I do not identify with any religion".
LEVEL_INF (Level of information)	Do you consider yourself well informed about the consequences of substance use?	1="Completely uninformed"; 2="Largely uninformed"; 3="Neither informed nor uninformed"; 4="Largely informed"; 5="Completely informed". LEVEL_INF will ultimately be the normalized value of the responses such that LEVEL_INF="(IQ9-1)/4".
INTERNET	Information source.	1="Yes"; 0="No".
SCHOOL	Information source.	*Idem*

LIST 2. *Independent variables in the analysis* (Continuation)

Name of the independent variable	Description of the variable	Response categories
PARENTS	Information source.	*Idem*
SIBLINGS	Information source.	*Idem*
FRIENDS	Information source.	*Idem*
MEDIA	Information source.	*Idem*

Source: Author's own creation.

sumption variables and their explanatory variables. Given the ordinal nature of the variables, the Spearman Rho correlation was calculated (ρ), which is a nonparametric test. For IRRITABILITY, SUPPORT_SCHOOL, CONTROL_P and INFL_PEERS, the factorial scores were considered as values. Dichotomous variables were used as dummy variables (Suites, 1957 [2012]).

In addition, three ordered logistic regressions were performed to examine the relationship between CONSUMPTION, DRUNKENNESS and BINGE and the individual environmental and informative factors. These regressions were created in two stages. Initially, individual and environmen-

tal factors were introduced to assess their relevance to alcohol consumption habits. Then, the variables linked to the information were included.

In addition to the conventional analysis of the significance of the regression coefficients, the values of the Akaike information criterion, the Schwartz criterion and the Hannan-Quinn criterion were compared between the model that excludes the information-related variables and the model that includes them. The inclusion of informative variables resulted in a decrease in the Akaike, Schwartz and Hannan-Quinn measures, which is considered positive in the evaluation of the model, as shown in Tables 3 to 5.

TABLE 1. *Response percentages of the variables used in the analysis (%)*

Variables explained	Never	Between 1 and 2 times	Between 3 and 9 times	Between 10 and 20 times	More than 20 times	NC
CONSUMPTION	58.2	28.6	8.1	0.6	1.1	3.4
DRUNKENNESS	78.7	14.7	1.6	0.1	0.9	3.9
BINGE DRINKING	73.2	17.3	3.9	0.4	0.9	4.3
Explanatory variables						
SEX			AGE			
Female (46.5 %)			≥17 years (43.8 %)			
Male (51.2 %)			<17 years (53.6 %)			
NC/other (2.3 %)			NC (2.6 %)			

IQ3: Regulatory compliance	Totally disagree	Strongly disagree	Neither agree nor disagree	Strongly agree	Totally agree	NC
CU_RULES_1	13.9	19.6	34.9	13.2	8.7	9.7
CU_RULES_2	11.1	14.8	22.5	27.8	16.2	7.6
CU_RULES_3	4.8	7.4	29.5	29.4	19.6	9.4
CU_RULES_4	4.4	7.2	23.9	30.9	24.9	8.6
CU_RULES_5	5.6	6.7	18.6	31.6	30.4	7.2

TABLE 1. *Response percentages of the variables used in the analysis (%)* (Continuation)

Variables explained	Never	Between 1 and 2 times	Between 3 and 9 times	Between 10 and 20 times	More than 20 times	NC
CU_RULES_6	8.3	9.9	29.9	23.6	20.4	7.9
CU_RULES_7	4.8	6.7	26.1	25.3	29.3	7.8
IQ4: Irritability	Almost never	Rarely	Sometimes	Often	Almost always	NC
IRRITABILITY_1	13.0	20.6	26.8	21.7	13.4	4.5
IRRITABILITY_2	33.0	26.7	16.5	11.8	7.4	4.7
IRRITABILITY_3	42.2	24.2	13.8	8.3	6.9	4.7
IRRITABILITY_4	51.3	21.4	13.2	4.1	5.0	4.9
IRRITABILITY_5	49.7	21.4	13.2	5.7	5.0	5.1
IQ5: Support of the school	Totally disagree	Strongly disagree	Neither agree nor disagree	Strongly agree	Totally agree	NC
SUPPORT_SCHOOL_1	4.5	8.9	30.1	35.7	17.4	3.4
SUPPORT_SCHOOL_2	2.1	3.1	10.8	33.7	47.1	3.1
SUPPORT_SCHOOL_3	5.8	9.7	30.9	32.8	17.6	3.1
SUPPORT_SCHOOL_4	6.1	11.6	30.8	32.1	15.3	4.1
SUPPORT_SCHOOL_5	7.4	10.6	34.6	28.1	15.5	3.8
IQ6: Control parental	Absolutely does not apply to me	Does not apply well to me	Applies somewhat to me	Applies very well to me	NC	
CONTROL_P_1	0.6	2.8	26.6	65.5	4.6	
CONTROL_P_2	4.2	8.7	41.9	38.4	6.8	
CONTROL_P_3	4.9	10.4	39.8	37.6	7.2	
CONTROL_P_4	7.3	14.1	36.2	34.3	8.2	
CONTROL_P_5	3.5	6.2	23.1	59.1	8.1	
CONTROL_P_6	2.9	4.4	21.9	63.1	7.6	
CONTROL_P_7	3.3	6.9	26.3	57.8	5.7	
CONTROL_P_8	10.6	17.3	34.9	29.0	8.1	
IQ7: Influence of peers	Totally disagree	Strongly disagree	Neither agree nor disagree	Strongly agree	Totally agree	NC
INFL_PEERS_1	83.1	6.4	3.5	1.2	1.8	4.1
INFL_PEERS_2	76.4	9.9	6.1	1.9	1.3	4.4
INFL_PEERS_3	85.0	4.4	3.3	1.4	1.5	4.4
INFL_PEERS_4	80.6	8.3	4.1	0.5	1.8	4.7

IQ8: Religion

1. Catholic (34.6 %)
2. Evangelist (3.1 %)
3. Islam (10.3 %)
4. Orthodox (2.9 %)

5. Other (1.8 %)
6. I do not identify with any religion (44.6 %)
7. NC (2.7 %)

IQ9: LEVEL_INF (Level of information)	Completely uninformed	Quite uninformed	Neither informed nor uninformed	Very informed	Completely informed	NC
	2.2	3.2	10.5	36.7	42.1	5.3
My information on substance use comes from:	Si	No	NC			

TABLE 1. *Response percentages of the variables used in the analysis (%)* (Continuation)

Variables explained	Never	Between 1 and 2 times	Between 3 and 9 times	Between 10 and 20 times	More than 20 times	NC
Internet	65.9	27.2	6.9			
School	66.3	26.8	6.9			
Parents/legal guardians	62.4	29.9	7.7			
Siblings	23.4	68.3	8.3			
Peers and friends	44.7	47.1	8.2			
Mass media	55.1	37.0	7.9			

Notes: (a) The quantities appear as percentages.

Source: Author's own creation.

RESULTS

Descriptive analysis of the variables and reliability of the scales

Regarding the prevalence of consumption, Table 1 reveals that 38.4 % of all adolescents report having consumed alcohol over the past thirty days. Similarly, 17.3 % report having gotten drunk during the past month and 22.5 % indicate that they have engaged in binge drinking over the past thirty days.

Regarding the level of information declared by the adolescents surveyed, 36.7 % consider themselves very informed and 42.1 % fully informed about substance use. As for the sources of information, the majority declare that they are informed at school (66.3 %), over the Internet (65.9 %) and by their parents or legal guardians (62.4 %). Fifty five percent (55 %) are informed over the mainstream media, 44.7 % by their peers and 23.4 % by their siblings.

The scales revealed consistency, especially in the case of parental control, peer influence and irritability, in which the factor loadings of the indicators exceed 0.6 and even 0.7. The values of Cronbach's alpha (α) and composite reliability (CR) are both above 0.7, while the average variance extracted (AVE) exceeds 0.5. On the scale of regulatory compliance, the AVE is slightly less than 0.5. However, despite the fact that

these are not optimal results, the scale's consistency can be accepted since the CR is significantly greater than 0.6 (Lam, 2012).

A similar situation is observed in the case of perceived school support. The low AVE value (0.49) is compensated for by the high-observed values of Cronbach's alpha (α) and the composite reliability (CR). The factorial loads of this latent variable are adequate, given that all of them are greater than 0.6. According to Hair and Alamer (2022), this value may be justified by the good results obtained in the α and CR.

Correlational analysis between explanatory factors and consumption variables

As for individual factors, bivariate analysis reveals that age and irritability correlate with all of the examined forms of alcohol consumption (see Table 2). The CU_RULES also reveals a significant positive correlation with CONSUMPTION and with BINGE, and a more moderate correlation with DRUNKENNESS. Sex does not display statistically significant differences with the alcohol consumption modalities.

As for the environmental variables, the influence of peers and being Muslim are the most relevant factors. The association between INFL_PEERS and the alcohol con-

sumption items is positive, with correlations approaching 0.2 (p<0.001). Identifying with Islam is (significantly) negatively related to all three dependent variables.

Regarding the correlation between parental control and the distinct consumption modes, the correlations are not significant except for the *drunkenness* consumption mode. As expected, school support shows a negative correlation with consumption, but this relationship also fails to be significant.

TABLE 2. *Spearman correlations (ρ) between CONSUMPTION and DRUNKENNESS and BINGE DRINKING with the explanatory variables (factors)*

Factors	Alcohol consumption modalities		
Individual	CONSUMPTION	DRUNKENNESS	*BINGE DRINKING*
SEX	-0.016 (0.563)	-0.053 (0.055)	0.002 (0.942)
AGE	0.196** (<0.001)	0.139** (<0.001)	0.111** (<0.001)
CU_RULES	0.121** (<0.001)	0.065* (0.033)	0.110** (0.001)
IRRITABILITY	0.148** (<0.001)	0.197** (<0.001)	0.131** (<0.001)
Setting			
SUPPORT_SCHOOL	-0.039 (0.181)	-0.019 (0.509)	-0.014 (0.638)
CONTROL_P	-0.002 (0.942)	-0.064* (0.023)	-0.052 (0.067)
INFL_PEERS	0.201** (<0.001)	0.197** (<0.001)	0.222** (<0.001)
ISLAM	-0.221** (<0.001)	-0.118** (<0.001)	-0.133** (<0.001)
Information			
LEVEL_INF	0.009 (0.745)	0.013 (0.638)	0.026 (0.386)
INTERNET	0.82* (0.004)	0.106** (<0.001)	0.051 (0.078)
SCHOOL	-0.031 (0.286)	-0.048 (0.095)	-0.034 (0.247)
PARENTS	-0.022 (0.447)	-0.053 (0.067)	-0.017 (0.566)
SIBLINGS	0.074* (0.011)	0.084** (0.004)	0.088** (0.003)
PEERS	0.146** (<0.001)	0.158** (<0.001)	0.165** (<0.001)
MEDIA	0.006 (0.835)	-0.007 (0.815)	-0.047 (0.108)

Note: * and ** represent statistical significance at 5 % and 1 %, respectively. The p-values are shown between parentheses.

Source: Author's own creation.

The variables related to information on substance use offer some interesting results. On the one hand, the perceived level of information on substance use does not correlate significantly with the different forms of alcohol consumption.

When the information comes mainly from friends or siblings, statistically significant correlations with consumption exist. However, when the information comes from the Internet, it correlates significantly with CONSUMPTION and DRUNKENNESS.

It should also be acknowledged that significant correlations do not result with regard to obtaining information mainly through the school, parents and the media.

Regression analysis of consumption variables

Tables 3, 4 and 5 show the results of the adjustments for CONSUMPTION, DRUNKENNESS and BINGE DRINKING, respectively, using ordered logit regressions. It is seen that the adjustments for the three types of alcohol consumption, without the inclusion of information-related variables, provide statistically significant models.

However, in all types of consumption, including variables related to the information available to the adolescent provides a better quality fit. The maximum likelihood ratios increase, with $p<0.001$, and, similarly, the information criteria of Akaike, Schwartz, and Hannan and Quinn of the models always decrease, leading to the selection of the model that includes the variables on information.

As for the individual variables, as expected, sex does not present statistical significance. On the other hand, age appears to be the most relevant variable, having a positive relationship with the consumption variables in all cases.

Non-compliance with standards appears to be a facilitator of consumption in CONSUMPTION (OR=1.185, p=<0.001) and in BINGE (OR=1.183, p=0.001), but not for DRUNKENNESS. Irritability is a risk factor in all types of alcohol consumption (CONSUMPTION, OR=1.123, p=0.007; DRUNKENNESS, OR=1.246, p<0.001; BINGE, OR=1.126, p=0.014).

Regarding the environmental variables, parental control suggests that it is possible to have a significant protective factor against parental consumption in the form of DRUNKENNESS (OR=0.843; p=0.036) and BINGE DRINKING (OR=0.859; p=0.040). Support from the school only demonstrates a protective capacity with regard to DRUNKENNESS (OR=0.896; p=0.045).

Without a doubt, of the environmental factors considered, the two most relevant ones in terms of alcohol consumption are peer influence, which acts as a facilitating element (CONSUMPTION: OR=1.234; p<0.001); DRUNKENNESS: OR=1.240; p<0.001); BINGE: OR=1.321; p<0.001). Being Muslim is a strong inhibitor (CONSUMPTION: OR=0.134; p<0.001); DRUNKENNESS: OR=0.250; p<0.001); BINGE: OR=0.212; p<0.001).

The level of information that adolescents report having about the consequences of substance use does not influence how they consume alcohol. No statistically significant differences exist between those who consider themselves well informed and those who do not.

Information from schools and parents may have a certain protective capacity against alcohol consumption, since they have an OR<1, but it is not significant. Likewise, the odds ratio reached with information from the Internet suggests that this source of information may act as an enhancer of all of the alcohol consumption forms examined in this work. However, it also does not reach statistical significance.

Information from the conventional media has a significant protective effect against excessive alcohol consumption (DRUNKENNESS: OR=0.774; *p*=0.022); BINGE: OR=0.729; *p*=0.002). On the other hand, information from siblings, and especially from peers, has a clear facilitating effect on all the types of alcohol consumption analyzed.

Without a doubt, the information obtained from peers is the source having the greatest impact on all of the consumption modalities. Therefore, in CONSUMPTION, its OR=1.422 (p<0.001), in DRUNKEN-NESS, OR=1.542 (p<0.001), and in BINGE, OR=1.621 (p<0.001).

DISCUSSION

The literature has documented that a statistically significant correlation exists between age and consumption patterns, which increase as adolescents grow older (De Looze *et al.*, 2017; López-Larrosa and Rodríguez-Arias, 2010). Likewise, adolescents displaying higher levels of irritability have a higher prevalence of alcohol con-

TABLE 3. *Results of ordered logistic regressions on CONSUMPTION*

Factors	Model without information variables			Model with information variables		
Individual	OR	p-value	IC (95 %)	OR	p-value	IC (95 %)
SEX	1.044	0.599	[0.889, 1.226]	1.029	0.746	[0.867, 1.220]
AGE	1.698**	<0.001	[1.453, 1.984]	1.690**	<0.0001	[1.434, 1.992]
CU_RULES	1.189**	<0.001	[1.094, 1.292]	1.185**	0.000	[1.086, 1.294]
IRRITABILITY	1.126**	0.004	[1.039, 1.221]	1.123**	0.007	[1.032, 1.222]
Environment	OR	p-value	IC (95 %)	OR	p-value	IC (95 %)
SCHOOL SUPPORT	0.939	0.133	[0.865, 1.019]	0.924	0.075	[0.847, 1.008]
P CONTROL	1.070	0.258	[0.951, 1.205]	0.966	0.603	[0.846, 1.102]
INFL_PEERS	1.282**	<0.001	[1.188, 1.384]	1.234**	<0.001	[1.136, 1.342]
ISLAM	0.189**	<0.001	[0.112, 0.318]	0.134**	<0.001	[0.068, 0.261]
Information	OR	p-value	IC (95 %)	OR	p-value	IC (95 %)
INF LEVEL	-	-	-	1.291	0.195	[0.878, 1.899]
INTERNET	-	-	-	1.042	0.679	[0.859, 1.263]
SCHOOL CENTER	-	-	-	0.857	0.112	[0.708, 1.037]
PARENTS	-	-	-	0.913	0.353	[0.754, 1.106]
SIBLINGS	-	-	-	1.304**	0.008	[1.073, 1.584]
PEERS	-	-	-	1.422**	<0.001	[1.197, 1.690]
MEDIA	-	-	-	0.891	0.197	[0.747, 1.062]
Pseudo-R2	9.73			Pseudo-R2	11.99	
Akaike	1733.119			Akaike	1585.893	
Schwartz	1791.758			Schwartz	1677.514	
Hannan-Quinn	1755.429			Hannan-Quinn	1620.859	
LR-ratio	184.26**			LR-ratio	210.99**	

Note: * and ** represent statistical significance at a 5 % and 1 % level, respectively.

Source: Author's own creation.

TABLE 4. *Results of ordered logistic regressions on DRUNKENNESS*

Factors	Model without information variables			Model with information variables		
Individual	OR	p-value	IC (95 %)	OR	p-value	IC (95 %)
SEX	0.873	0.177	[0.717, 1.063]	0.903	0.342	[0.731, 1.115]
AGE	1.381**	0.001	[1.141, 1.670]	1.378**	0.002	[1.124, 1.689]
CU_RULES	1.111*	0.044	[1.003, 1.231]	1.075	0.192	[0.964, 1.200]
IRRITABILITY	1.236**	<0.001	[1.124, 1.360]	1.246**	<0.001	[1.126, 1.379]
Environment	OR	p-value	IC (95 %)	OR	p-value	IC (95 %)
SCHOOL SUPPORT	0.895*	0.029	[0.810, 0.989]	0.896*	0.045	[0.804, 0.997]
P CONTROL	0.914	0.205	[0.795, 1.051]	0.843*	0.036	[0.719, 0.989]
INFL_PEERS	1.304**	<0.001	[1.199, 1.418]	1.240**	<0.001	[1.130, 1.361]
ISLAM	0.350	<0.001	[0.201, 0.612]	0.250**	<0.001	[0.120, 0.520]
Information	OR	p-value	IC (95 %)	OR	p-value	IC (95 %)
INF LEVEL	-	-	-	1.138	0.585	[0.715, 1.812]
INTERNET	-	-	-	1.264	0.070	[0.981, 1.628]
SCHOOL CENTER	-	-	-	0.853	0.179	[0.676, 1.075]
PARENTS	-	-	-	0.882	0.297	[0.697, 1.117]
SIBLINGS	-	-	-	1.399**	0.005	[1.107, 1.767]
PEERS	-	-	-	1.542**	<0.001	[1.242, 1.915]
MEDIA	-	-	-	0.774*	0.022	[0.621, 0.964]
Pseudo-R2	9.81			Pseudo-R2	13.61	
Akaike	1029.339			Akaike	926.0677	
Schwartz	1087.953			Schwartz	1017.731	
Hannan-Quinn	1051.641			Hannan-Quinn	961.0467	
LR-ratio	109.46**			LR-ratio	139.92**	

Note: * and ** represent statistical significance at a 5 % and 1 % level, respectively.

Source: Author's own creation.

sumption, as confirmed by works of Méndez-Garrido and Azaustre-Lorenzo (2016), among others. The failure to comply with regulations also correlates with higher consumption, although in a more moderate way, as reflected in the work of Rubio *et al.* (2022).

More parental control and support acts as a protective factor against more extreme alcohol consumption, as shown by Berge *et al.* (2016) and García-Barba *et al.* (2018). On the contrary, the influence of peers presents positive correlations with consumption, as described by Pons and Buelga (2011),

Talbott *et al.* (2008), Song *et al.* (2012) and Burk *et al.* (2012). On the other hand, being Muslim correlates negatively, as King and Roeser (2009) and Andrés and Belzunegui (2022) revealed. And no correlations have been found between consumption and other religious identifications.

The vast majority of adolescents (approximately 80 %) consider themselves well informed with regard to substance use. However, the lack of correlation between the level of perceived information and alcohol consumption suggests that this perception is not a determining factor in explaining the

TABLE 5. *Results of ordered logistic regressions on BINGE*

Factors	Model without information variables			Model with information variables		
Individual	OR	p-value	IC (95 %)	OR	p-value	IC (95 %)
SEX	0.995	0.957	[0.829, 1.194]	0.983	0.861	[0.808, 1.195]
AGE	1.408**	0.000	[1.180, 1.680]	1.437**	<0.001	[1.191, 1.735]
CU_RULES	1.203**	0.000	[1.093, 1.324]	1.183**	0.001	[1.068, 1.309]
IRRITABILITY	1.121*	0.013	[1.024, 1.227]	1.126*	0.014	[1.024, 1.239]
Environment	OR	p-value	IC (95 %)	OR	p-value	IC (95 %)
SCHOOL SUPPORT	0.921	0.082	[0.839, 1.011]	0.914	0.076	[0.827, 1.009]
P CONTROL	0.957	0.505	[0.841, 1.089]	0.859*	0.040	[0.743, 0.993]
INFL_PEERS	1.353**	<0.001	[1.248, 1.467]	1.321**	<0.001	[1.211, 1.442]
ISLAM	0.295**	<0.001	[0.170, 0.514]	0.212**	<0.001	[0.103, 0.437]
Information	OR	p-value	IC (95 %)	OR	p-value	IC (95 %)
INF LEVEL	-	-	-	1.462	0.093	[0.938, 2.278]
INTERNET	-	-	-	1.053	0.648	[0.842, 1.318]
SCHOOL CENTER	-	-	-	0.950	0.645	[0.765, 1.181]
PARENTS	-	-	-	0.948	0.629	[0.762, 1.179]
SIBLINGS	-	-	-	1.326*	0.012	[1.065, 1.651]
PEERS	-	-	-	1.621**	<0.001	[1.327, 1.980]
MEDIA	-	-	-	0.729**	0.002	[0.596, 0.891]
Pseudo-R2	9.17			Pseudo-R2	13.15	
Akaike	1276.294			Akaike	1154.472	
Schwartz	1334.871			Schwartz	1246.073	
Hannan-Quinn	1298.585			Hannan-Quinn	1189.432	
LR-ratio	126.49**			LR-ratio	169.16**	

Note: * and ** represent statistical significance at a 5 % and 1 % level, respectively.

Source: Author's own creation.

different degrees of alcohol consumption. This finding suggests the need to evaluate the origin of such information to determine whether it influences consumption patterns (Belzunegui *et al.*, 2020) and the underestimation of the associated risks, in line with the findings of García del Castillo, García del Castillo-López and López-Sánchez (2014).

Despite having an OR<1, the information provided by the centers and parents does not have sufficient statistical significance to be considered a protective factor against alcohol consumption. Similarly, the information provided by the

Internets, despite having an OR>1, also fails to be significant. Since these are the main sources of information for adolescents, their lack of significance calls into question the sources of information for prevention models, a criticism that has already been mentioned in other studies. Villanueva and Duque (2022: 92), after reviewing multiple school intervention programs, concluded that:

Interventions based on the transfer of information are not effective, beyond merely increasing knowledge. Information on its own does not lead to changes in behavior.

Information from conventional media, which is assumed to be supervised information, may act as a protective factor against excessive alcohol consumption if it presents well-informed and non-alarmist messages, as suggested by Córdoba, Camarelles and San José (2017). On the other hand, certain messages minimize the risk of consumption, giving the conventional media a contradictory role. However, the information coming from siblings, and especially that from peers and friends, acts as a facilitator of alcohol consumption, suggesting the importance of the influence of social models (Mezquita *et al*., 2006).

CONCLUSIONS

This analysis has confirmed the effect of different factors such as age, peer influence and information on substance use from informal channels, as predictors of alcohol consumption. Furthermore, irritability has been found to increase the probability of consumption, whereas parental control has been shown to have a protective effect against some of the more aggressive forms of this behavior, such as drunkenness. On the other hand, it has been concluded that sex, support from the educational center or formal information channels are not related to consumption.

It has also been found that alcohol consumption amongst adolescents is independent of the degree to which they consider themselves informed. This topic should be examined in future research, focusing on the quality of information that is handled by the individuals. Although adolescents report being well informed about the effects of alcohol, this perception fails to reduce their consumption levels. In fact, information from friends and siblings acts as a facilitator of consumption, while information from formal sources such as the media or educational centers may inhibit consumption,

but not in a statistically significant way. This finding may be relevant to the organization and planning of alcohol consumption prevention programs.

In summary, although adolescents are increasingly informed of the dangers of alcohol, this information alone fails to reduce their consumption. Therefore, preventive strategies should focus not only on information dissemination, but also on addressing social influence and other personal and contextual risk factors (especially social class and occupational status of parents).

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