




# Expectancies and Motives as Predictors of Risky Alcohol Consumption in College Women

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## Abstract

Despite the consequences of alcohol use, it continues showing a high incidence among college students. Besides, the increasing presence of women in risk alcohol patterns calls for a gender-sensitive approach to design specific actions. Some variables have been analyzed as underlying alcohol consumption (expectations and motives). This paper assesses the type and influence of both variables on female university alcohol consumers at different levels of risk. Five hundred four college women were assessed using the Spanish adaptations of the Expectancy Questionnaire, the Drinking Motives Questionnaire-Revised, and the AUDIT. We determine the unique contributions of expectancies, motives, and the presence of binge drinking (BD) to the pattern of risky drinking. The percentage of variance explained by risky drinking is 37.7%. Negative expectancies (20.4%) are the most explanatory variables, followed by enhancement motives (10.4%). Interventions with university women should focus on their negative expectancies, in addition to addressing for improvement, coping with depression, and conformity motives.

**Keywords** Risk drinking · Drinking motives · Alcohol expectancies · Binge drinking · College women

Alcohol consumption is a major public health issue that has reached epidemic levels in the youth population (Busto Miramontes et al., 2021; ESPAD Group, 2020). It also represents an increasing concern due to the high incidence of risk patterns, such as binge drinking (BD), among university students (Amare & Getinet, 2019; Crawford et al., 2019; Crosnoe et al., 2017; NIAAA, 2004). Despite alcohol having multiple associated biopsychosocial consequences (Bolden, 2019; George et al., 2019; Hermens & Lagopoulos, 2018; Martin et al., 2018; Meda et al., 2017), its consumption in the context of university is not only accepted among students but even encouraged (Arnett, 2000).

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While the number of male consumers seems to remain stable, there has been a progressive increase in the number of women who consume alcohol in recent years (Grant et al., 2017; OEDA, 2021; White et al., 2015). The similarity in the way both men and women consume alcohol has been highlighted (Alonso-Fernández et al., 2019; Busto Miramontes et al., 2021; Canfield et al., 2021; Cheng & Anthony, 2017; Wilsnack et al., 2018), with female university students engaging more strongly in BD (Alves et al., 2021; Iwamoto et al., 2018; Johnston et al., 2015; Kang et al., 2020; Wilsnack et al., 2018). In Spain, 61.6% of female alcohol consumers aged 18 admit to having been intoxicated in the past year, compared to 59.2% of males of the same age (OEDA, 2020). In a sample of students from different Spanish universities (Cortés et al., 2017), the percentage of girls who engage in BD reaches 60.4%, compared to 39.6% of their counterparts.

The findings regarding the evolution of women's alcohol consumption are inconsistent. Some studies state that they consume less alcohol and experience fewer psychosocial consequences (Keyes et al., 2011; Wilsnack et al., 2009), while others report opposite results (Caamaño-Isorna et al., 2017; Moure-Rodríguez et al., 2016). What is certain is that women's physical differences in weight and body distribution cause them to process alcohol differently than men, for example, by absorbing the substance faster (Erol & Karpayak, 2015), which exposes them to an increased risk of suffering harmful consequences such as memory loss (Baildon et al., 2021) or alteration of menstrual cycles and infertility (Van Heertum and Rossi, 2017).

As Wilsnack et al. (2018) recommend, it is necessary to pay greater attention to possible gender differences both in the pattern of alcohol consumption and in the risk factors and their underlying variables. One of the most investigated variables in the university population as a potential determining factor linked to alcohol consumption, including a problematic use pattern, is that of expectancies (both positive and negative). Alcohol expectancies are cognitive representations of the anticipated effects of alcohol (Patel & Fromme, 2010). Positive expectancies include the positive sociability, tension reduction, fun, and enhanced sexuality beliefs associated with alcohol, whereas negative expectancies include beliefs that alcohol can cause social, cognitive, and behavioral impairment; risk and aggression; and negative self-perception (Bacio, 2021; Patel & Fromme, 2010). Regardless of gender, it is concluded that there is a direct relationship between positive expectancies associated with alcohol consumption (Lee et al., 2018; Ramirez et al., 2020) and a higher prevalence rate of risky consumption (Busto Miramontes et al., 2021; McBride et al., 2014; Moure-Rodríguez et al., 2016; Patrick et al., 2016). Studies carried out with only female university students (Jacobs & Jacobs, 2016; Kim, 2018; Lyons & Willott, 2008; Watts et al., 2015) conclude that positive expectancies related to social aspects are strong predictors of BD. Iwamoto et al. (2018), Lyons and Willott (2008), and Young et al. (2015) allude to the fact that drinking alcohol generates feelings of power, which they believe will help them fit in with their peer group and gain social attention. In addition, Iwamoto et al. (2018) have shown that positive expectancies related to enhancing sexual experiences and reducing tension are related to BD.

Findings regarding negative expectancies have been less consistent, given that there is an inversely proportional relationship between these and alcohol consumption in university students, regardless of gender (Nicolai et al., 2010; Ramirez et al., 2020). In both cases, when risky consumption is evaluated, this relationship becomes positive (Alves et al., 2021; Pabst et al., 2014; Patrick et al., 2016; Zamboanga et al., 2010). Different authors (Bacio, 2021; Zamboanga & Ham, 2008) explain this positive association between negative expectancies and problematic alcohol consumption by indicating that university students might find the effects that researchers label as negative to be attractive. For example,

Patrick and Maggs (2011) found that 16% of students rated having a hangover as neutral or positive, 17% rated passing out as neutral or positive, and 34% rated doing or saying something embarrassing as neutral or positive.

Another determining factor that research has identified as a relevant precursor of alcohol consumption and its associated problems is that of motives (Bresin & Mekawi, 2021). Motivational models of alcohol use claim that people drink alcohol to satisfy needs that are associated with specific patterns of alcohol expectancies and consequences related to its consumption (Cooper et al., 2016). Specifically, the meta-analysis by Bresin and Mekawi (2021) concludes that the frequency and quantity of consumption show higher correlations with social and enhancement motives, followed by coping motives and, to a lesser extent, conformity motives. However, when problematic drug use is evaluated, it is the coping motives that stand out to a greater extent, with enhancement and social motives also being related to problematic alcohol consumption but in a weaker way (Bacio, 2021; Cooper et al., 2016; Foster et al., 2014) and conformity motives not showing any association with this pattern of consumption (Bacio, 2021; Vernig & Orsillo, 2015; Wahesh & Lewis, 2015).

Similar results are obtained in studies that perform predictive analysis in female university students, where coping motives obtain a greater predictive weight in dangerous alcohol consumption patterns (Hussman, 2018; Kenney et al., 2015; Kim, 2018; LaBrie et al., 2007; O'Brien et al., 2008). It is followed by enhancement motives (LaBrie et al., 2007; Loxton et al., 2015; O'Brien et al., 2008) and finally by social ones (LaBrie et al., 2007; O'Brien et al., 2008). Only the work of Hussman (2018) shows that conformity motives are significantly associated with female university students' BD behavior.

Given the high prevalence of risky alcohol consumption among women during the last decade and the few studies carried out specifically on the determining factors that influence the appearance of these consumption patterns, this study aims to evaluate the type and influence of expectancies and motives referred to by female university students who consume alcohol at different risk levels. Identifying factors that underlie problematic consumption patterns will help develop more effective prevention and intervention models for women, improving the limited efficacy of other studies (Bresin & Mekawi, 2021; Magill & Ray, 2009; Samson & Tanner-Smith, 2015; Wilsnack et al., 2018).

## Method

### Participants

The sample of this study consists of 504 alcohol-consuming female university students between the ages of 18 and 20 years: 18-year-olds (25.8%,  $n=130$ ), 19-year-olds (33.7%,  $n=170$ ), and 20-year-olds (40.5%,  $n=204$ ) with a mean age of 19.15 years ( $SD=0.802$ ). The age of onset of alcohol use is 15 ( $SD=1.46$ ), and 72.6% ( $n=366$ ) have engaged in BD.

### Variables

**Sociodemographic** Sex, chronological age, and age of onset of alcohol consumption have been included.

**Binge Drinking** A self-report based on an adaptation of the Timeline Followback (TLFB) by Sobell and Sobell (1996) was used to collect their alcohol consumption (quantity and frequency) over the last 6 months. This time interval makes it possible to account for the intermittent consumption (with periods of non-consumption that can exceed 30 days) carried out by young people (Courtney & Polich, 2009; Townshend & Duka, 2005). From the information offered by the participants in this self-report, the following variables were generated:

Maximum standard drinking units (SDUs) consumed: Of all the consumption episodes, the one with the highest amount of SDUs ingested was selected.

Engagement or not in BD: Based on the SDUs consumed in the episode of maximum consumption and the number of hours in which the consumption took place, the participants were classified as BD or No BD. Following the most accepted definition in different reviews (Cortés & Motos, 2015; Courtney & Polich, 2009; Parada et al., 2011), the proposal of the National Institute on Alcohol Abuse and Alcoholism (NIAAA) (2004) was used as a criterion to define the BD in this study, but in this case, the grams of alcohol proposed by the original definition were adjusted to the Spanish SDU (1 SDU = 10 gr). Thus, women who consumed six or more SDUs in an interval of 2–3 h were classified as BD.

**Expectancy Questionnaire (EQ)** (Leigh & Stacy, 1993; Spanish adaptation: Camacho et al., 2010): The scale consists of 34 items with a 6-point Likert scale format (0 = never to 5 = always) measuring positive and negative expectancies about alcohol consumption. Items take the form of short phrases prefaced by *When I drink alcohol...* Respondents are instructed to specify the likelihood of the indicated effects or consequences happening to them when they drink. There are a total of 8 scales which, in turn, are grouped into two second-order factors: positive alcohol consumption expectancies (positive social, fun, sex, and tension reduction) and negative alcohol consumption expectancies (negative social, negative emotional, negative physical, and negative cognitive). The original questionnaire presented an adequate reliability coefficient, ranging from 0.73 for the tension reduction scale to 0.91 for the sex scale, as well as 0.94 for positive expectancies and 0.88 for negative expectancies. The Spanish adaptation obtained similar results, both in the first-order factors (0.75–0.93) and in the second-order factors (0.95 for positive expectancies and 0.91 for negative expectancies). Table 1 shows the reliability coefficients of the evaluated sample.

**Table 1** Reliability coefficients of the evaluated sample

Second-order factors	First-order factors	
Positive expectancies .936	Positive social	.893
	Fun	.890
	Sex	.898
	Tension reduction	.786
Negative expectancies .877	Negative social	.729
	Emotions	.806
	Physical effects	.778
	Cognitive effects	.763

**Drinking Motives Questionnaire – Revised (DMQ-R)** (Cooper, 1994; Spanish adaptation: Mezquita et al., 2011): According to this theoretical approach, motives for drinking can be classified based on two dimensions: the desire to achieve a positive incentive or to avoid a negative one and whether the focus is internal (towards oneself) or external (towards others). It consists of 28 items, each contributing to one of five subscales: social, seeking a positive incentive and having an external focus; enhancement, seeking a positive incentive and having an internal focus; coping with anxiety and coping with depression, both avoiding a negative incentive and having an internal focus; or conformity, avoiding a negative result and having an external focus. Considering all the occasions on which they drink, participants indicate how often they drink for the reason specified in each item on a 5-point Likert scale ranging from 1 (almost never/never) to 5 (almost always/always). Mezquita et al. (2011) reported the following internal consistency values: social  $\alpha=0.78$ , coping with depression  $\alpha=0.88$ , enhancement  $\alpha=0.82$ , conformity  $\alpha=0.75$ , and coping with anxiety  $\alpha=0.63$ . In this study, higher reliability coefficients have been obtained in most of the scales: social  $\alpha=0.74$ , coping with depression  $\alpha=0.91$ , enhancement  $\alpha=0.86$ , conformity  $\alpha=0.87$ , and coping with anxiety  $\alpha=0.65$ .

**The Alcohol Use Disorder Identification Test (AUDIT)** (Babor et al., 1989; Spanish adaptation: Rubio Valladolid et al., 1998): A 10-item measure of alcohol use during the preceding year and its associated problems. The first 3 questions refer to the frequency and quantity of consumed alcohol, questions 4 to 6 explore the possibility of alcohol dependence, and finally questions 7 to 10 assess consequences associated with harmful consumption. The first 8 items are answered with a 5-point Likert scale (0 = never to 4 = daily or almost daily), and the last two include a 3-point scale with 0–2–4 values. The total score that can be obtained ranges from 0 to 40. The internal reliability of the test was acceptable, both in the original and in the Spanish version, standing at 0.86. In this study, the reliability coefficient was 0.77. Following the recommended cut-off points for young people in this age group (Demartini & Carey, 2012), those who scored 5 or more (positive AUDIT) were considered to be risk users. Those who scored 4 or less (negative AUDIT) were considered non-risk.

## Procedure

The sample was obtained using the “snowball” method where active participants reach out to new potential participants. The researchers visited first and second year classes of those degrees of the University of Valencia with the highest female ratio—Psychology, Language Therapy, and Social Work. In all cases, they asked for student’s voluntary collaboration. Students who agreed to participate were summoned a day later to fill out the questionnaire. These participants were encouraged to share the research among their university female friends of other degrees and provide the researchers’ contact information to them.

Since the snowball sampling method is not random, to assess the representativeness of the sample, a weighting of the BD/No BD groups was carried out as they were unbalanced. Two criteria were used as there were no prevalence data. According to ESTUDES (OEDA, 2020), 46.8% of 18-year-old women do BD. On the other hand, a study with a population of 18- and 19-year-old female students from different universities (Cortés et al., 2017) showed a percentage of 60.4%. Using both weighting criteria, no different results

were obtained, with little gain in error variance reduction, so it was decided to use the original sample without weighting.

Eight people received training in administering the instrument for data collection, so its correct completion was guaranteed. All of them had two guided practices under the tutelage of the signatories of this study. Prior to the completion of the tests, all participants signed an informed consent, where the objectives of the investigation were clearly reflected, and the anonymity of the offered data was guaranteed.

The instrument was filled out in the presence of one of the interviewers.

The study was conducted in compliance with Spanish legislation (Organic Law 3/2018, December 5) and the code of ethics for research involving human subjects, as outlined by the University of Valencia Human Research Ethics Committee. The survey used in this study is completely anonymous, and there is no possibility of identifying the respondent. In addition, the survey itself includes an introduction that specifies the objectives to be achieved and the benefits it can bring, as well as an explicit reference to compliance with the current Data Protection Law. The last part of the introduction includes a paragraph in which the person indicates that they agree to participate voluntarily in the study.

## Data Analysis

The statistical package IBM SPSS Statistics 26 was used to carry out descriptive analyses of the variables: age of alcohol consumption onset, consumption expectancies, and consumption motives, both for the total sample and according to the level of alcohol consumption risk evaluated through the AUDIT (negative AUDIT, score less than or equal to 4; positive AUDIT, score greater than or equal to 5) (Demartini & Carey, 2012). Additionally, to verify the possible existence of differences depending on risk level, contrasts of means were carried out for these same variables using the student's *t* test.

In order to explore in greater depth the determining cognitive factors that modulate consumption behavior in women, mean contrasts were carried out for each of the items of the expectancies and consumption motive questionnaires.

Next, zero-order correlations (using Pearson's correlation coefficient), positive and negative expectancies, and the five types of motives were evaluated. This made it possible to confirm which elements were most strongly associated with risky consumption and to identify variables that presented unforeseen bivariate relationships.

Finally, stagewise order regression analyses were carried out to detect the unique contributions to patterns of risky alcohol consumption of the following variables: negative expectancies, enhancement motives, positive expectancies, coping with depression motives, coping with anxiety motives, engage or not in binge drinking, social motives, and conformity motives. The order of introduction of the variables in the regression analysis was marked by the degree of correlation of the different determining factors in accordance with the AUDIT score.

## Results

First, descriptive statistics were obtained for the considered variables both for the global sample of participants and divided into two blocks based on risk level. The results that appear in Table 2 show that female university students who start drinking alcohol at a

**Table 2** Descriptive analysis of evaluated expectancies and motives

	Total sample		Negative AUDIT		Positive AUDIT		<i>t</i>	<i>p</i>	<i>d</i>
	Mean	SD	Mean	SD	Mean	SD			
Age of alcohol consumption onset	14.71	1.47	15.11	1.50	14.44	1.38	5.02	.000	.47
AUDIT	6.26	4.16	2.70	1.06	8.65	3.73	-26.15	.000	2.0
Positive social expectancies	15.78	7.23	12.91	7.35	11.70	6.48	-7.50	.000	.70
Positive fun expectancies	16.01	6.82	12.44	6.64	18.38	5.84	-10.32	.000	.96
Positive sex expectancies	8.24	5.92	6.02	5.38	9.72	5.80	-7.20	.000	.65
Tension reduction expectancies	5.17	3.66	3.67	3.42	6.17	3.48	-7.97	.000	.72
Negative social expectancies	1.49	2.21	.87	1.93	1.91	2.29	-5.46	.000	.48
Negative emotional expectancies	2.14	2.66	1.56	2.43	2.52	2.75	-4.15	.000	.37
Negative physical expectancies	6.74	4.36	5.15	4.02	7.80	4.26	-6.99	.000	.63
Cognitive/performance expectancies	8.99	5.98	6.52	5.48	10.63	5.74	-8.01	.000	.73
SUM_positive expectancies	45.20	19.56	35.03	18.88	51.97	16.93	-10.27	.000	.95
SUM_negative expectancies	19.33	12.33	14.10	11.45	22.84	11.65	-8.28	.000	.75
DMQ-R social motives	14.00	4.26	12.12	3.89	15.25	4.03	-8.66	.000	.78
DMQ-R enhancement motives	11.48	4.90	8.93	3.84	13.18	4.80	-11.02	.000	.95
DMQ-R conformity motives	6.27	2.74	6.00	2.47	6.44	2.89	-1.81	.071	.16
DMQ-R coping Anxiety motives	5.80	2.44	4.99	1.74	6.35	2.68	-6.87	.000	.57
DMQ-R coping depression motives	13.00	5.92	10.85	4.06	14.44	6.511	-7.62	.000	.63

later age have a significantly lower score on the AUDIT than those who start earlier. In all the other variables, higher scores are observed in risky consumers, with differences in conformity motives being only non-significant.

Thus, risky consumers show higher scores in all expectancies, both positive and negative. It is worth highlighting the greater weight attributed by all women to positive expectancies (35.03/51.97 points) compared to negative ones (14.10/22.84 points). Specifically, positive consequences of a social and fun nature show the highest scores, followed by negative cognitive expectancies and positive sex expectancies, and, last, negative social and emotional expectancies.

In addition, the means were compared for each of the items on the expectancies and motives questionnaires to assess which determining cognitive factors influence risky consumption to a greater or lesser extent. Table 3 shows the statistical indicators, as well as the contrast of means, for each expectancy item.

Expectancies with the highest averages in young female risky consumers are those associated with social and fun motives. Only two expectancies included in these factors are not included in the highest scoring level “EQ1. I am more socially accepted” and “EQ30. I feel pleasant physical effects.”

In a second block, we find expectancies related to positive sex (EQ5, EQ12, EQ19, EQ27), those related to tension reduction (EQ7, EQ14, EQ21), and those of a cognitive nature (EQ8, EQ17, EQ26, EQ31, EQ34).

Regarding drinking motives, Table 4 presents the statistical indicators and mean contrasts for each of the items, depending on whether they engaged in risky behavior or not. Differences are observed in 24 out of the 28 motives.

**Table 3** Expectancy scores (EQ) for the total sample and subgroups based on consumption risk

	Total sample		Negative AUDIT		Positive AUDIT		<i>t</i>	<i>p</i>	<i>d</i>
	Mean	SD	Mean	SD	Mean	SD			
EQ1. I am more socially accepted	1.86	1.41	1.66	1.40	1.99	1.41	−2.60	.01	.23
EQ2. I get aggressive	.59	.97	.34	.77	.76	1.05	−5.15	.000	.44
EQ3. I enjoy feeling lively	3.03	1.38	2.50	1.43	3.37	1.22	−7.08	.000	.66
EQ4. I feel ashamed of myself	.82	1.10	.61	.99	.95	1.14	−3.41	.001	.31
EQ5. I have more sexual desire	2.34	1.71	1.71	1.59	2.75	1.65	−7.07	.000	.64
EQ6. I feel nauseous	1.43	1.30	1.12	1.22	1.64	1.31	−4.45	.000	.40
EQ7. It eliminates my negative feelings and moods	1.61	1.40	1.13	1.26	1.92	1.41	−6.56	.000	.58
EQ8. I am less alert	2.18	1.54	1.86	1.60	2.40	1.46	−3.92	.000	.35
EQ9. I am more outgoing	3.21	1.43	2.73	1.45	3.52	1.32	−6.31	.000	.57
10. I feel happy	2.68	1.45	2.13	1.37	3.05	1.38	−7.36	.000	.67
11. I get into fights	.37	.82	.21	.72	.48	.86	−3.76	.000	.33
12. It makes me more sexually active	1.82	1.72	1.25	1.51	2.19	1.75	−6.41	.000	.56
13. I feel guilty	.71	1.12	.44	.97	.89	1.17	−4.66	.000	.41
14. I feel less stressed	1.80	1.52	1.33	1.45	2.11	1.49	−5.75	.000	.52
15. I get a hangover	2.64	1.64	1.95	1.55	3.11	1.54	−8.26	.000	.75
16. It makes it easier for me to socialize	2.60	1.60	2.02	1.58	2.98	1.50	−6.87	.000	.62
17. I become clumsy or uncoordinated	2.00	2.35	1.41	1.37	2.39	2.75	−4.69	.000	.42
18. I have a good time	3.43	1.36	2.80	1.43	3.85	1.13	−8.75	.000	.83
19. I show more interest in sex	2.07	1.69	1.49	1.54	2.45	1.68	−6.56	.000	.58
20. I get selfish	.53	.95	.32	.80	.67	1.01	−4.35	.000	.38
21. I am able to escape from problems	1.77	1.45	1.20	1.30	2.14	1.42	−7.54	.000	.68
22. I feel sad or depressed	.61	.91	.51	.85	.68	.93	−2.12	.034	.19
23. I can speak more freely	2.58	1.54	2.07	1.51	2.92	1.47	−6.18	.000	.56
24. I experience unpleasant physical effects	.91	1.16	.75	1.08	1.03	1.19	−2.68	.008	.24
25. It's fun	2.92	1.50	2.09	1.42	3.48	1.27	−11.45	.000	1.0
26. I have trouble walking straight	1.68	1.40	1.09	1.28	2.08	1.33	−8.22	.000	.74
27. I am more assertive sexually	2.02	1.64	1.57	1.59	2.32	1.61	−5.15	.000	.46
28. I am friendlier	2.79	1.44	2.23	1.47	3.17	1.28	−7.37	.000	.69
29. I get a headache	1.75	1.48	1.33	1.30	2.03	1.52	−5.51	.000	.48
30. I feel pleasant physical effects	1.29	1.34	.92	1.13	1.54	1.41	−5.40	.000	.47
31. I cannot concentrate	1.60	1.42	1.18	1.31	1.88	1.42	−5.57	.000	.51
32. I feel more social	2.75	1.51	2.19	1.52	3.12	1.39	−6.91	.000	.64
33. I feel good	2.66	1.45	2.00	1.41	3.09	1.31	−8.87	.000	.80
34. I have memory and concentration problems	1.52	1.44	.98	1.28	1.88	1.43	−7.40	.000	.66

Except for the conformity subscale, all other subscales—*social, enhancement, coping with anxiety*, and *coping with depression*—show significant differences between women who engage in risky consumption and those who do not.

Finally, a stepwise regression analysis was performed to detect the contribution of the variables to the consumption pattern, being the dependent variable the total score in



**Table 4** Motive scores (DMQ-R) for the total sample and subgroups according to consumption risk

	Total sample		Negative AUDIT		Positive AUDIT		<i>t</i>	<i>p</i>	<i>d</i>
	Mean	SD	Mean	SD	Mean	SD			
	1. To celebrate something	3.83	1.13	3.43	1.24	4.11			
2. To relax	1.43	.83	1.19	.48	1.59	.97	-6.17	.000	.50
3. Because I like the feeling	2.44	1.22	1.95	1.06	2.76	1.21	-7.98	.000	.71
4. Because most of my friends do it when we get together	2.26	1.24	1.95	1.04	2.47	1.32	-4.99	.000	.43
5. To forget my worries	1.64	.98	1.28	.68	1.88	1.08	-7.66	.000	.64
6. Because it's exciting	2.01	1.16	1.58	.88	2.29	1.25	-7.49	.000	.64
7. To be sociable	1.93	1.14	1.77	.98	2.05	1.22	-2.83	.005	.25
8. Because it makes me feel more self-confident	1.77	1.11	1.53	.89	1.93	1.21	-4.31	.000	.37
9. To get a "high"	2.32	1.23	1.84	1.08	2.64	1.23	-7.70	.000	.68
10. Because it is the norm for special occasions	3.06	1.27	2.74	1.20	3.28	1.29	-4.74	.000	.43
11. Because it helps me when I feel nervous	1.41	.85	1.20	.58	1.54	.97	-4.91	.000	.40
12. Because it's fun	2.76	1.35	2.04	1.17	3.24	1.25	-11.00	.000	.98
13. Because it makes social gatherings more fun/entertaining	2.91	1.31	2.25	1.17	3.35	1.21	-10.19	.000	.93
14. To cheer me up when I'm in a bad mood	1.65	1.02	1.32	.76	1.87	1.12	-6.51	.000	.55
15. To be liked by others	1.35	.76	1.22	.61	1.44	.84	-3.38	.001	.29
16. To calm suffering or unrest	1.47	.87	1.20	.60	1.65	.98	-6.38	.000	.53
17. Because it helps me when I feel depressed	1.43	.84	1.20	.59	1.58	.94	-5.55	.000	.46
18. So that others don't make fun of me for not drinking	1.17	.58	1.16	.59	1.18	.59	-.27	.781	.02
19. To reduce my anxiety	1.20	.61	1.07	.32	1.28	.74	-4.46	.000	.35
20. To stop thinking about something	1.55	.88	1.27	.64	1.74	.97	-6.64	.000	.55
21. To stop thinking negatively about myself	1.25	.68	1.13	.46	1.33	.78	-3.68	.000	.30
22. To help me see things in a more positive way	1.38	.87	1.18	.53	1.52	1.02	-4.89	.000	.39
23. To stop feeling pessimistic about the future	1.20	.60	1.08	.42	1.28	.70	-3.87	.000	.31
24. Because my friends pressure me to drink	1.22	.62	1.18	.55	1.25	.66	-1.39	.165	.12
25. To fit into a group that I like	1.23	.66	1.19	.60	1.25	.70	-1.01	.311	.09

**Table 4** (continued)

	Total sample		Negative AUDIT		Positive AUDIT		<i>t</i>	<i>p</i>	<i>d</i>
	Mean	SD	Mean	SD	Mean	SD			
26. Because it makes me feel good	1.96	1.12	1.52	.82	2.25	1.21	-8.06	.000	.67
27. To forget painful memories	1.44	.86	1.19	.53	1.60	.99	-6.04	.000	.49
28. So as not to feel left out	1.29	.69	1.25	.62	1.31	.74	-.99	.319	.08

AUDIT. To do this, after examining the zero-order correlations (Table 5), the variables were entered into the stagewise regression analysis following the order marked by them. In this first analysis, positive expectancies ( $p=0.84$ ), coping with anxiety motives ( $p=0.342$ ), and social motives ( $p=0.298$ ) were found to not contribute to improving the percentage of variance explained, so they were excluded. The result of the final stagewise analysis is shown in Table 6.

The percentage of explained variance of risky alcohol consumption measured with the AUDIT score is 37.7%. The variable that explains the highest percentage of this variance is negative expectancies (20.4%), followed by enhancement motives (10.4%). In third place, engaging or not in intensive alcohol consumption or BD is highlighted (5.52% of explained variance). Coping with depression and conformity motives are the ones that explain the least (1.1% of explained variance compared to 0.6%).

## Discussion

This work aims to respond to the need for intervention on risky alcohol use behavior that is increasingly prevalent among female university students. In the evaluated sample, almost two-thirds of them had a positive AUDIT score, which indicates risky consumption. For this reason, exploring the determining cognitive factors that underlie this consumption will improve the level of knowledge that is available at the moment, and above all, it will help adapt the design of the actions to be carried out.

Preceding research confirms that variables such as expectancies and motives towards alcohol use act as determining factors of the consumption behavior that young women engage in during their time at university (Busto Miramontes et al., 2021; Caamano-Isorna et al., 2011; Dir et al., 2017; Gómez et al., 2017), making it clear in the meta-analysis by Carey et al. (2007) that the most effective interventions with university students are those that address both variables (expectancies and motives).

The results from the present work offer the following conclusions regarding female university students: in general, it is the risk consumers who show the highest scores in both positive and negative expectancies, although the weight they give to each of them is very different, being higher for the positive ones, especially those of a social and fun nature. Risk consumers seem to expect to a greater extent that drinking alcohol will allow them to feel happier, have fun, feel good, be more extroverted, socialize better, be friendlier, or to speak more freely. By contrast, what they expect to a lesser extent is to become selfish, aggressive, get into fights, be ashamed of themselves, feel guilty, or feel sad. It seems logical that if such positive consequences are expected, consumption behavior is reinforced, which is associated with drinking more alcohol and possibly engaging in risky consumption.

When comparing these results with previous research, the relevance of social expectancies is verified (Jacobs & Jacobs, 2016; Kim, 2018; Watts et al., 2015), while at the same time disagreeing on the importance given to positive expectancies related to sex and tension reduction (Iwamoto et al., 2018). Although they are significantly more present among female consumers who present higher risky behaviors, these expectancies do not occupy a prominent place. Feeling more assertive sexually or developing a greater sexual desire are expectancies that moderately influence the decision to consume alcohol among female university students, while resorting to alcohol to eliminate negative moods, to escape from problems, or to feel less stressed show less influence on consumption behavior.

**Table 5** Correlations between expectancies, motives, and variables related to the consumption pattern

	Engages or not in BD <sup>a</sup>	Exp <sup>b</sup> social +	Exp fun +	Exp sex +	Exp tension reduction +	Exp social –	Exp emotional –	Exp physical –	Exp cognitive –	Mot <sup>c</sup> social	Mot enhancement	Mot conformity	Mot coping anxiety	Mot coping depression	Sum positive Exp	Sum negative Exp
Engages or not in BD	1															
Exp social +	.210**	1														
Exp fun +	.254**	.717**	1													
Exp sex +	.184**	.489**	.494**	1												
Exp tension reduction +	.145**	.577**	.647**	.467**	1											
Exp social –	.083	.365**	.300**	.387**	.415**	1										
Exp emotional –	.073	.416**	.265**	.337**	.391**	.562**	1									
Exp physical –	.151**	.467**	.405**	.347**	.421**	.438**	.468**	1								
Exp cognitive –	.162**	.584**	.560**	.511**	.545**	.494**	.531**	.560**	1							
Mot social	.214**	.520**	.491**	.326**	.307**	.218**	.236**	.337**	.337**	1						
Mot enhancement	.209**	.501**	.690**	.407**	.447**	.309**	.320**	.293**	.409**	.587**	1					
Mot conformity	–.023	.329**	.174**	.148**	.183**	.356**	.423**	.250**	.231**	.375**	.266**	1				
Mot coping Anxiety	.095*	.410**	.385**	.230**	.401**	.331**	.387**	.218**	.284**	.409**	.571**	.461**	1			

Table 5 (continued)

	Engages or not in BD <sup>a</sup>	Exp <sup>b</sup> social +	Exp fun +	Exp sex +	Exp tension reduc- tion +	Exp social –	Exp emo- tional –	Exp physi- cal –	Exp cogni- tive –	Mot <sup>c</sup> social	Mot enhance- ment	Mot con- formity	Mot coping anxiety	Mot coping depres- sion	Sum positive Exp	Sum negative Exp
Mot coping Depres- sion	.126**	.321**	.356**	.310**	.515***	.347**	.414**	.308**	.290**	.355**	.489**	.357**	.620**	1		
Sum posi- tive Exp	.249**	.875***	.884**	.743**	.767**	.434**	.421**	.498**	.688**	.520**	.632**	.261**	.430**	.433**	1	
Sum nega- tive Exp	.161**	.604**	.528**	.512**	.573**	.695**	.742**	.805**	.887**	.372**	.428**	.357**	.361**	.401**	.675**	1
AUDIT	.345**	.332**	.451**	.367**	.386**	.411**	.282**	.357**	.397**	.324**	.480**	.127**	.364**	.376**	.466**	.507**

<sup>a</sup>BD binge drinking

<sup>b</sup>Exp expectancies

<sup>c</sup>Mot motives

\*The correlation is significant at the 0.05 level (bilateral)

\*\*The correlation is significant at the 0.01 level (bilateral)

**Table 6** Stagewise regression analysis for predicting binge drinking

R	R <sup>2</sup>	ΔR <sup>2</sup>	F ΔR <sup>2</sup>	Step 1 <sup>a</sup>		Step 2 <sup>b</sup>		Step 3 <sup>c</sup>		Step 4 <sup>d</sup>		Step 5 <sup>e</sup>	
				β	p value for β	β	p value for β	β	p value for β	β	p value for β	β	p value for β
1	.452a	.204	127.892	.153	11.309***								
2	.555b	.308	74.782	.101	7.220***	.303	8.648***						
3	.565c	.319	.011	7.688	.091	6.339***	.264	7.025***	.086	2.773**			
4	.609d	.371	.052	40.656	.084	6.087***	.230	6.311***	.084	2.825**	2.176	6.376***	
5	.614e	.377	.006	5.117	.091	6.471***	.235	6.462***	.100	3.273***	2.087	6.102***	−.136

<sup>a</sup>Step 1. Negative expectancies

<sup>b</sup>Step 2. Enhancement motives

<sup>c</sup>Step 3. Coping depression motives

<sup>d</sup>Step 4. Engage or not in binge drinking

<sup>e</sup>Step 5. Conformity motives

\* .01 < p ≤ .05, \*\* .001 < p ≤ .01, \*\*\* p ≤ .001

Something similar happens when motives are evaluated, given that it is also the risky consumers who score the highest in all of them, except conformity. In addition, the results obtained do not differ greatly from those existing with university students in general and female university students in particular. In all cases, social and enhancement motives stand out (positive reinforcement reasons), along with coping reasons (negative reinforcement reasons), with conformity motives being in the background (Bacio, 2021; Bresin & Mekawi, 2021; Cooper et al., 2016; Foster et al., 2014; Gmel et al., 2012; Vernig & Orsillo, 2015; Wahesh & Lewis, 2015). It is true that both in problematic consumption and in the case of female university students, coping motives are the ones that are referred to the most, while in our work, they occupy a position similar to that of positive reinforcement motives. It is very likely that having used an assessment instrument that separates the coping motives—*anxiety and depression*—into two subscales, as opposed to the combined measure used in the other studies, justifies the difference found.

In light of our findings, we can state that the motives of women who engage in risky alcohol use reflect, on the one hand, the social normalization that exists in the face of this behavior and its connection with fun and pleasure (to celebrate something, because it is the norm, because it is something most of my friends do, because it is a way to make social gatherings more entertaining and even exciting and fun). On the other hand, it also highlights the way this substance is used to reduce negative emotional states or avoid facing situations for which it seems one may not be prepared (cheer me up when I am in a bad mood, calm some suffering or bad feeling, forget worries and painful memories, or to stop thinking about things and even to help see things in a more positive way, including oneself).

The only reasons in which the higher or lower risk alcohol users do not differ are in conformity, which is also the least represented in both groups. The results suggest that women, regardless of the level of risk associated with their consumption, do not usually consider aspects related to the acceptance of others (to be liked by others, so that they do not make fun of me for not drinking, due to pressure from my friends, or to avoid feeling left out) when deciding whether they drink or not.

In this study, we have tried to find out which are the variables that show the greatest weight when it comes to predicting risky consumption. This analysis will make it possible to define with greater precision the aspects to be included in any intervention with female risk consumers like the ones in this sample. Stepwise regression analysis makes it possible to make decisions about the best predictors, given that there is a continuous reevaluation of them, so that if any regressor is explained by the rest (that is, it lacks its own specific contribution), it is eliminated. Among other things, it is striking how social motives lose predictive power and negative expectancies or conformity motives gain it. We can state that when negative expectancies are combined with enhancement motives, intensive alcohol consumption, and coping and conformity motives, there is a greater probability of developing risky alcohol consumption.

The relevance that negative expectancies acquire in this group requires interventions that address what it means for a woman, in the short and medium term, to experience a hangover and headache or to be less alert, to have impaired motor coordination, to not be able to concentrate, or not remember some aspects of the night, consequences that risk consumers are aware that they are likely to experience, but that do not hinder their consumption behavior at the time.

To this trivialization of the biopsychosocial effects derived from alcohol consumption, we add the importance of enhancement motives, which act as positive reinforcement of their behavior (feeling good, liking the sensation, being fun, or experiencing a high) and coping

with depression that acts as negative reinforcement (to forget worries, cheer me up when I am in a bad mood, calm some suffering, stop thinking negatively about myself, or stop thinking about something). Both types of motives, each one, with its positive or negative character, act as enhancers of consumption behavior.

These results coincide in part with previous studies (Kenney et al., 2015; LaBrie et al., 2007; Loxton et al., 2015; O'Brien et al., 2008) in which enhancement motives are significant predictors of problematic alcohol use in female university students. In this sense, it would be relevant to work with these young women regarding the gap that exists between what they expect to find when they drink alcohol and the real consequences that can derive from consuming a depressant substance such as alcohol. In this way, it would be easier to increase their predisposition towards a change in the way they consume alcohol, given that the reasons why they drink are more typical of lower alcohol consumption.

Furthermore, there are contrasting conclusions regarding the role that coping motives play in women's drinking behavior, although in this case it is important to pay attention to what pattern of alcohol consumption is measured in each study. This makes it possible to verify that studies that conclude that coping motives are not influential on alcohol consumption behavior in female university students (Baildon et al., 2021; Loxton et al., 2015) have not specifically evaluated risky consumption. However, studies, such as the present one, where this type of consumption is evaluated, indicate that helping face the problems that cause them discomfort are among the main reasons why female university students drink (Bacio, 2021; Hussman, 2018; Kenney et al., 2015; Kim, 2018). For this reason, it would be advisable to provide healthy coping strategies that allow them to manage their negative emotional state in a more adjusted way. Furthermore, an additional aspect that contributes to understanding the heterogeneity of the results, already commented above, is that most of the studies evaluate coping motives on a global scale, without distinguishing between the coping-anxiety and coping-depression subscales, which may also be influencing the obtained results.

Regarding conformity motives, the results coincide with the conclusions of the work of Hussman (2018). In both cases, these motives provide a small percentage of variance in the prediction of risky consumption. In general, women show greater concern for their physical appearance compared to men, which makes them feel more insecure with themselves and may lead them to resort to drinking alcohol to be accepted by others and avoid rejection (Rawana et al., 2010). In this way, the conformity motives act as a negative reinforcement on consumption, given that they allow avoiding negative social evaluations and obtaining the acceptance of others, despite being aware that this intake has associated harmful effects on their health (Piran, 2017). For these types of situations, preventive measures that work on the awareness of the influence of others in potential drinking situations would help develop the critical thinking skills that affect decision-making.

Our results allow us to reflect on the adequacy of actions that are focused on excessive consumption patterns. In this case, engaging in BD explains less variance of risk consumption than determining factors such as negative expectancies or enhancement motives, which supports the conclusion of Carey et al. (2007) regarding the efficacy of interventions that include tools that work on determining cognitive factors in combination with consumption variables.

## Limitations and Future Lines of Research

The limitations of this study include having used self-report measures to assess the different variables, thus assuming possible biases in the responses issued, including social desirability (Kaya et al., 2016). Despite this, it is important to point out that self-reports are considered



valid and reliable strategies that guarantee the anonymity of the participant and the confidentiality of the data (Degenhardt et al., 2013).

Although the sample with which the study was conducted is large, it was obtained without random selection or stratified sampling, so our results can only be generalized to groups of female university students of a certain age group. Future studies should guarantee a greater generalization of results and at the same time attend to specific population groups of different sexual orientation (for example, lesbians, bisexuals, and asexuals) and transgender women, by constituting subgroups with a high risk of experiencing problems related to excessive alcohol consumption (Drabble et al., 2005).

At the same time that diverse samples of risk consumers are evaluated, it would be convenient to include variables that allow increasing the explained variance of risky alcohol use behavior among women. The key role that positive and negative consequences play on the relationship with determining cognitive factors (expectancies and motives) and with the consumption pattern is especially highlighted (Barnett et al., 2014; Fairlie et al., 2016; Lee et al., 2018). An additional aspect that cannot be ignored is that at these ages, risky alcohol consumption is usually associated with the consumption of other substances (OEDA, 2021), which would make polydrug use a variable to be considered in this type of study.

Likewise, the scarcity of studies that evaluate the influence of gender-specific variables (sexual objectification, enjoyment of sex, body shame (Baildon et al., 2021; Haikalis et al., 2015); traditional femininity norms, concern over appearance (Hussman, 2018)) in risky alcohol consumption by women would amply justify the need to include them in the explanatory scheme of female drinking behavior.

## Practical Implications

This study identifies a set of variables and orders them according to their predictive influence on risky consumption behavior in female university students. This contribution to the field of prevention makes it easier to identify potential aspects, from greater to lesser importance, that could be worked on to reduce risky alcohol consumption in this group. Mainly, we highlight the relevance of applying intervention measures focused on knowledge, self-exploration, and reflection on the level of reversibility of the bio-psycho-social effects that they are experiencing through alcohol use. They are aware of the effects, but they trivialize and see as foreign to them the risks they assume in the short and medium term when engaging in this behavior. In addition, this self-exploration should be extended to binge drinking situations, given that in these situations, there is a greater risk assumed at all levels of which they are also not aware. Another aspect to take into account in female university students is the need they manifest to have to resort to risky consumption levels to achieve a positive emotional state, which is impossible for them to achieve due to the type of substance. For this reason, emotional management strategies should be included among the skills to improve in this group, as well as training in critical-reflective thinking that allows them to objectively analyze experiences and information and be able to reach their own conclusions about the reality they are immersed in.

## Conclusion

In many studies, information is available regarding the variables that influence consumption patterns, but not which variables can be used to better predict the behavior. Identifying the set of variables that make up the best regression model provides prevention

professionals with valuable information on the order in which certain motives and expectancies of consumption influence the way female university students consume alcohol.

**Author Contribution** All authors contributed to the study conception and design, material preparation, and data collection. Analysis was performed by María-Teresa Cortés-Tomás and María-Dolores Sancerni-Beitia. The first draft of the manuscript was written by María-Teresa Cortés-Tomás, José-Antonio Giménez-Costa, and Patricia Motos-Sellés, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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**Data Availability** The datasets generated for this study are available on request to the corresponding author.

## Declarations

**Ethics Approval** It was not necessary for the study because there were no ethics-relevant problems. People just filled out the survey. No manipulation or violation was done. The study was undertaken in compliance with Spanish legislation (approved by the Department of Education) and the code of ethics for research involving human subjects outlined by the University of Valencia Human Research Ethics Committee.

**Consent to Participate** The last part of the first page of the survey includes a paragraph in which participants indicate that they agree to participate voluntarily in the study.

**Consent for publication** All authors have approved the final draft and order of authors and provide consent to *International Journal of Mental Health and Addiction* to publish this work.

**Competing Interests** The authors declare no competing interests.

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