RESEARCH PAPER

Motivational Factors Associated with the Risk of Problematic Alcohol Consumption in Ecuadorian University Students

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ABSTRACT

Background

University students' drinking is a public health problem because of its potential link with risk behaviors, emotional problems, and poor academic performance. It is important to understand the motives behind drinking behaviors to target psychosocial risk factors and ensure evidence-based prevention strategies.

Objective

This study aimed to explore the correlation between drinking motives (using the Spanish version of the Drinking Motives Questionnaire [CMCA]) and the risk of problematic alcohol use (using the CAGE questionnaire) as a function of sex, age, and academic program.

Methods

This was a quantitative study with a survey design, cross-sectional, correlational. A total of 683 students from the Universidad Nacional de Chimborazo participated in this study in the first semester of 2024. Survey instruments CAGE and CMCA were administered electronically using a written questionnaire. Because of some violations of normality, descriptive analyses and nonparametric tests were used: Mann–Whitney U test was used for comparing sex, Kruskal–Wallis test for differences between academic programs, and Spearman's correlation for examining associations between variables.

Results

Female students predominated the sample. CAGE scores were low, and CMCA scores were moderate, with social and enhancement motives being the most prominent. The scores of male students were significantly higher than those of female students for both CAGE_total and CMCA_total ($p < 0.05$). Significant differences were found between the academic programs, with Medicine and Education showing the highest scores. There was a positive and statistically significant relationship between CAGE_total and CMCA_total ($\rho = 0.291$, $p < 0.001$).

Conclusion

This age-old motivational hypothesis is robustly supported by drinking motives being significantly correlated with problematic alcohol use outcomes. The findings suggest the need for risk reduction and emotional regulation prevention programming to be implemented on university campuses where ICPs address gender and program differences.

Keywords: University students; Alcohol consumption; Drinking motives; Risk factors; Mental health.
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INTRODUCTION

The use of alcohol is a public health issue with regard to risky behavior, academic failure, and chronic emotional issues among university students. Adolescence is a developmental window that increases academic pressures, autonomy, involvement in new social circles, and peer pressure, all of which can promote the initiation and/or intensification of alcohol consumption as a coping response or as a way to fit in socially (1). In fact, there are several studies that indicate that there are significantly more university students who drink on binges than are found in other populations, which, in turn, puts them at greater risk of experiencing short- and long-term negative outcomes (2). However, it is important to recognize that this is a time when risk profiles should be identified to chart the motives for drinking alcohol and direct preventive interventions. Cooper's motivational model suggests four dimensions: coping motives, conformity motives, social motives and reinforcement motives; all of which point to significant variations in behavior both in terms of the frequency of consumption as well as the pattern of consumption (3).

Recent findings indicate that reinforcement motives are related to an elevated risk of problematic consumption, whereas social motives are related to lower risk use patterns (4). The Motives for Alcohol Consumption Questionnaire (CMCA) has been translated and validated in Spanish-speaking populations, with good internal consistency and structural validity (5). At the same time, the CAGE is a short, sensitive, and easily administered screening tool in many clinical and community settings and is well established as a screening instrument for problematic alcohol use (6). This is because it is feasible to combine both instruments and simultaneously strong motivational factors with early risk in this way, and a comprehensive analysis is achieved.

In Ecuador, scientific evidence has been found of the high prevalence of drinking in the university environment, with differences by location, gender, age, and academic area (7). However, little knowledge exists about the risks of problematic alcohol consumption and alcohol use motives, making it difficult to design interventions using local information. Therefore, in the framework of the present research, the analysis of the existing motivations and risk of problematic consumption was carried out, with the instruments CMCA and CAGE, respectively, in the university population in Ecuador, where greater vulnerability has been found to motivate actions and programs of prevention and health promotion in this case, the university population in Ecuador.

MATERIALS AND METHODS

The general objectives of this study were to examine the relationship between the motivation of drinking and the problematic drinking of college students in a quantitative, correlational and cross-sectional design. The study took place in Ecuador at the national university of Chimborazo, between January to June 2024 in the academic year of 2023-2024. The total population was made up of enrolled students in the Clinical Psychology,

Medicine, Education, and Nursing programs. The participants were those who responded to a digital questionnaire and it was non-probability sampling using a convenience sampling method. There were 683 complete and congruent samples, ages 18–30, from which the data were excluded.

The CAGE Questionnair was used to evaluate the risk of problematic consumption by using four dichotomous items that are brief and the total score ranges from 0 to 4, with 2–4 being considered as risk factors. The Motives for Alcohol Consumption Questionnaire (CMCA) was a 20-item questionnaire on a Likert scale, divided into various dimensions reflecting motives of reinforcement, coping, social motives and conformity. The two questionnaires were digital and were given in the university classroom through the university's platforms. Students participated either on their own or as part of a group, there were no rewards involved, and all participation was anonymous. As part of the preparation for administering the assessment instruments, a pilot test was done with 20 students to check the coherence and clarity of the questions and the whole questionnaire. Participants gave informed consent online prior to answering and the ethical principles set forth in Declaration of Helsinki (2013) were observed. All information was kept confidential and participants anonymous.

Data were analysed statistically with IBM-SPSS Statistics version 25. Descriptive statistics such as medians, interquartile ranges, and frequencies were calculated. Total CAGE and total CMCA was not normally distributed as revealed by Kolmogorov-Smirnov test and thus non-parametric tests were used. Intergroup comparisons of women versus men was made using the Mann Whitney U test and differences among academic programs was analyzed using the Kruskal-Wallis test. Spearman's "rho" correlation coefficient was used to assess the relationship between age, total CAGE and total CMCA. Statistical significance level at $p<0.05$ was set for all the tests.

RESULTS

The major results of the research are summarized below in the order of the characteristics of the sample, comparison between groups, and relationship between groups. The basic sociodemographic characteristics of the 683 students who participated in the study are summarized in Table 1. Most were female and in the 18–24 age group. Students who studied Nursing or Psychology were the largest cohorts (Figures 1–5).

Table 1. Sociodemographic Characteristics of the Sample

Variable	n (%) / Median (IQR)
Age (years)	21 (IQR: 3)
Sex	
– Female	410 (60.0%)
– Male	273 (40.0%)
Academic Program	
– Psychology	215 (31.5%)
– Nursing	182 (26.6%)
– Medicine	148 (21.7%)
– Education	138 (20.2%)

Note. IQR = Interquartile range. Percentages may not sum to exactly 100% due to rounding.

The differences between the scores for CAGE_total and CMCA_total among men and women were calculated and are shown in Table 2, which were analyzed using the Mann-Whitney U test. The findings indicate significant differences between men and women in their scores for the risk of

problematic drinking and motivations for consuming alcohol. A visual comparison of these median scores by gender is presented in Figure 1.

Table 2. Comparison of CAGE_total and CMCA_total by Sex (Mann-Whitney U Test)

Variable	Sex	Median (IQR)	U Statistic	p-value
CAGE Total	Female	0 (IQR: 1)	46,820	0.001*
CAGE Total	Male	1 (IQR: 1)	—	—
CMCA Total	Female	2.0 (IQR: 1.2)	50,112	0.018*
CMCA Total	Male	2.3 (IQR: 1.1)	—	—

*Note. IQR = Interquartile range. * $p < 0.05$ indicates a statistically significant difference.*

Table 3 shows the results of the Kruskal-Wallis analysis, which showed that both the main variables differed significantly among majors. Psychology had the lowest scores, and on the other hand, values for Education and Medicine were higher. Figure 2 shows the median scores for each of four programs.

Table 3. Comparison by Academic Program (Kruskal-Wallis Test)

Variable	χ^2	df	p-value	Programs Compared
CAGE Total	12.44	3	0.006*	Psychology, Nursing, Medicine, Education
CMCA Total	10.22	3	0.017*	Psychology, Nursing, Medicine, Education

*Note. df = degrees of freedom. * $p < 0.05$ indicates statistically significant differences between groups.*

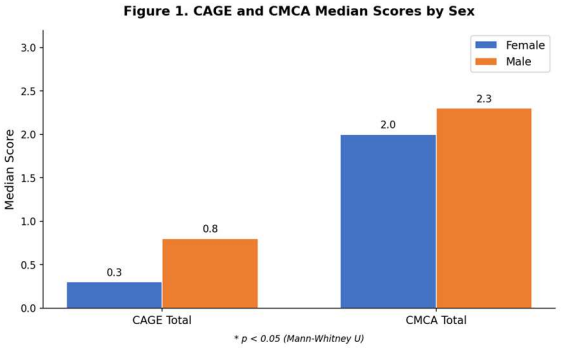
Dunn's test with Bonferroni correction was used to determine if there were any significant differences between the various majors for the CAGE_total and CMCA_total scores, which were found to be different by the Kruskal-Wallis test. The results confirmed that there were significant differences between the scores of the PSYCHOLOGY variable and the MEDICINE and EDUCATION variables ($p<0.05$). Likewise, the total score for Education was higher than for Nursing ($p < 0.05$) in the CMCA_total. This indicates that the values of risk and motivation for consuming alcohol were the highest in the Medicine and Education programs and the lowest in the Psychology program.

Table 4. Post Hoc Comparisons (Dunn Test with Bonferroni Correction)

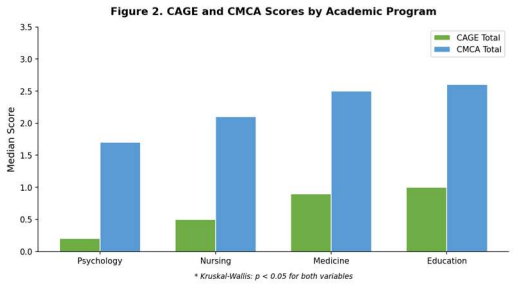
Comparison	Z Score	p (Bonferroni)	Interpretation
Psychology vs. Nursing	2.18	0.042*	Nursing > Psychology

Psychology vs. Medicine	2.55	0.021*	Medicine > Psychology
Psychology vs. Education	3.10	0.006*	Education > Psychology
Nursing vs. Medicine	0.98	0.612	No significant difference
Nursing vs. Education	2.01	0.048*	Education > Nursing
Medicine vs. Education	1.76	0.078	Not significant

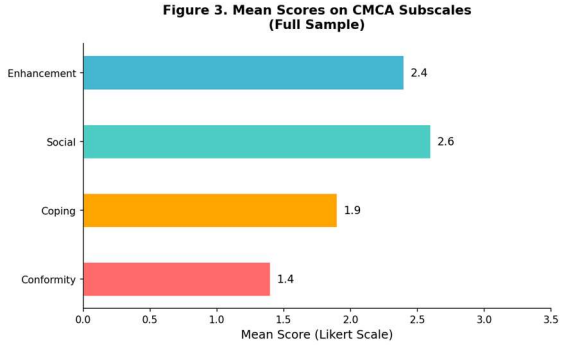
*Note. * $p < 0.05$ indicates a statistically significant difference. Bonferroni adjustment applied.*



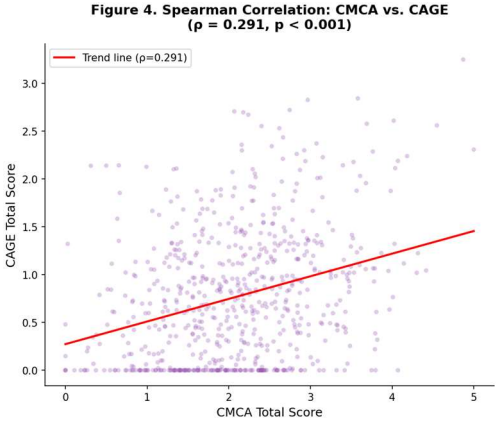
*CAGE and CMCA Median Scores by Sex. Error bars indicate interquartile range. * $p < 0.05$ (Mann-Whitney U test).*



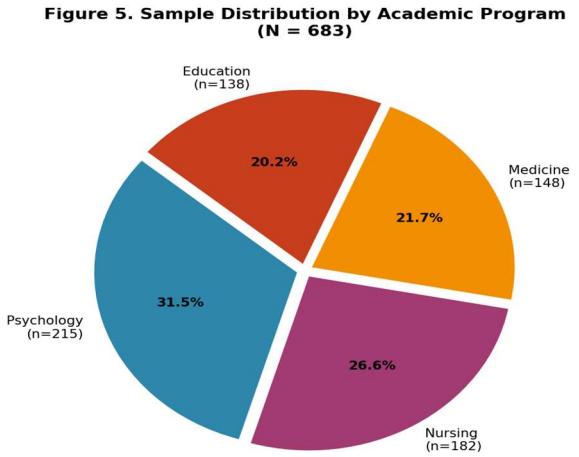
CAGE and CMCA Median Scores Across Academic Programs. Significant differences detected by Kruskal-Wallis test ($p < 0.05$).



Mean Scores on CMCA Subscales (Full Sample). Enhancement and Social motives predominate over Coping and Conformity.



Scatter Plot of Spearman Correlation Between CMCA Total and CAGE Total ($\rho = 0.291$, $p < 0.001$, $N = 683$). The regression line shows a positive directional trend.



Distribution of the Study Sample by Academic Program (N = 683). Psychology and Nursing comprised the majority of participants.

The results of this study offer a better understanding of the association between motives for drinking and the increased risk of problematic drinking among university students in Ecuador. Compared to the CAGE scores obtained, the levels of risk appear to be low, whereas the level of the CMCA scores appears to be moderate, indicating that there is a consumption pattern rather than a pattern of dependence. This is in keeping with the tendency of previous research with university students, where the consumption tends to be related to group activities, celebrations and social integration pursuits (1, 2). As can be seen from Figure 3, social and enhancement motives are more prevalent than coping and conformity motives, supporting the hypothesis that the use of alcohol is, for most of the students at this university, an attempt to integrate into the social life of the university rather than a psychological escape mechanism.

Sex Differences in Alcohol Consumption Motives and Risk

Overall, significant differences in the frequency of substance use (CAGE_total) and motivations (CMCA_total) were observed by sex, with men showing higher scores on both measures (Tables 1 and 2 and Figure 1). The results are in line with the literature, which suggests moderate and episodic patterns of use in women, mediated by an increased positive attitude towards use and reduced perceived risk by the women in that study (3, 4). Differential results have been observed in studies conducted in Latin America and North America, where the male use rate is higher and the motivations for using substances include coping and emotional reinforcement (5, 6). The issue of the gendered gap is especially pertinent in the context of gender norms in Ecuadorian society. The normalization, or even endorsement, of problematic drinking among men, such as drunkenness as a rite of passage or a symbol of masculinity, can exacerbate the risk among male students as they move into a new environment for learning away from their families. On the other hand, if female intoxication behavior has social stigma, as may be the case, part of this is likely to account for the lower scores of women, but may not rule out SUDs that are not recognized or reported. Qualitative approaches should be used in future studies to further elucidate how each group's gender identity, peer attitudes/prescriptions, and cultural norms influence their alcohol-related behavior. However, social and enhancement motives had the highest mean scores on the subscale analyses of the CMCA (Figure 3), when the samples were combined.However, it is important to note in the current analyses that when samples were pooled, the social and enhancement motives showed the highest mean scores (Figure 3) across the full sample. Disaggregated by sex, male students showed better scores on the dimensions of enhancement and coping, on which Cooper would predict that males would score higher on higher-risk drinking trajectories (10). Acknowledging the importance of prevention messaging that targets the sexual function of alcohol on male students.

Academic Program Differences

Table 3 and Figure 2 obtained from Kruskal-Wallis test indicated that there were significant differences between the programs in both variables. The post-hoc analysis (Table 4) verified the following: Psychology majors had significantly lower CAGE_total scores than Education or Medicine majors, as well as significantly lower scores on motivations for drinking than Nursing majors. The results must be treated with care, but they are in line with findings from other studies indicating that programs that were more demanding either in academic content or emotional load were found to have higher consumption either as a coping technique to deal with academic stress or reflecting social practices that are characteristic of this field of study (7–9). Some of the factors that may have contributed to the relatively high scores found in the Medicine students are the rigor and content of the academic programme, the clinical work hours, the acceptance of alcohol use as an accepted part of a medical social culture, and the psychological demands and pressures of dealing with human illness and mortality at a critical age. Frankly, a number of cross-national studies have reported high levels of alcohol misuse among medical students, and this is why it is urgent to develop specially designed alcohol related interventions within faculties of health sciences (8, 9). The observed pattern is somewhat unexpected from an education program, as this is not a program that would be generally known for its clinical orientation. This may be associated with the high workloads along with low levels of psychological support for the students at school and the drinking culture among students in the education themes. This should be examined in program-specific studies to further understand the academic climate, social contexts, and available mental health resources in each faculty. Psychology students have been performing at a more consistent level, which may be a protective factor because of their potentially higher exposure to mental health education, self-awareness training, and familiarity with mental health risk factors related to substance use. Alternatively, there could be selection effects, such as personality traits that motivate students to select clinical psychology, which, in part, protects them from developing risky drinking behaviors.

Motivational Profile and Theoretical Implications

The correspondence to the social and reinforcement dimensions across the entire sample is consistent with Cooper's motivational model, which suggests that these dimensions are typically more associated with recreational substance use; however, when associated with high situational pressure of either academic or emotional concerns, these could become risk factors (10). Conformity was the least motivating reason , as shown in Figure 3, indicating that students are not drinking to avoid social rejection, but mostly to improve on positive experiences or to have social interaction. This is not an insignificant distinction, as social or enhancement motives may become problematic over time, especially for students under academic pressure or in a social transition stage, though less immediately related to a condition that is pathological compared to coping motives. Such trends suggest the importance of bolstering emotional education and stress management, as well as enhancing self-control skills in university programmes, particularly in those in which specific vulnerabilities are known. Other programs based on motivational interviewing (11, 12) that aim to help individual members of each student group understand how drinking fits within the functions they play in their relationship with their peers have demonstrated promise in decreasing harmful

use without loss of autonomy or internal motivation for change.

Correlation Between CAGE and CMCA

The Spearman correlation analysis (Figure 4) was used to test the strength of the association between the motivational scores related to CAGE_total and CMCA_total and showed to be statistically significant and positive ($\rho = 0.291$; $p < 0.001$). The correlation is of some magnitude, but also near significant enough that the instruments used to assess motivation can be used as early screening tools in a university health context to further investigate students who might be at risk of developing problematic consumption from an early stage. This is consistent with the existing literature, which shows that motivational dimensions are predictive of alcohol outcomes in the long term across a variety of populations (13, 14). The relatively small effect size also raises questions about other factors influencing CAGE risk scores that are not included in the CMCA measure. Several factors have been previously demonstrated to be associated with drinking issues; personality traits, family history of drug/alcohol use, peer network factors, prior trauma, and socioeconomic factors were not measured in the current study. The inclusion of these variables in future longitudinal studies would provide a broader study model for predicting risk in the context of universities in Ecuador.

Limitations and Future Directions

The constraints and setbacks of this study were thoroughly considered. The limitations of the study include the fact that non-probability convenience sampling does not permit generalization outside the National University of Chimborazo, and the cross-sectional design does not allow for inferences concerning the causal relationship between the variables under study (motivations and problematic consumption risk). Furthermore, self-reported data may suffer from social desirability response bias, especially for measures of alcohol-related behaviors that may have social stigma. Despite these limitations, the sample size used, the application of appropriate non-parametric statistical tests, and the use of validated and internationally known instruments express the internal validity of the results. Future studies should implement longitudinal designs to analyze whether motivational profiles have an impact on longitudinal changes in CAGE scores and involve more universities in different regions of Ecuador to explore regional differences. The addition of qualitative elements, such as focus groups or semi-structured interviews, could add richness to the quantitative results and provide information on what students think matters to them, socially and culturally, in terms of drinking alcohol. Furthermore, the potential interactions between motivation and risk, examining the moderating role of resilience, social support, and institutional belonging in this relationship, are promising for translational research.

Implications for Prevention

The present study proves that motivations for substance use are important to address when explaining the risk of problematic patterns in the population of university students in Ecuador. International studies support a link between coping and reinforcement motives, and the risk of negative substance use and a link between social motives and the initial phases of use (11–13). However, in this study, an emergent relationship was found social motives were particularly salient. The possibilities for cultural explanation and for various types of socialization in the Ecuadorian context, and for the various institutional contexts, as well as the importance of university support networks, are numerous. Overall, the study shows a strong connection between drinking motives and the likelihood of substance use disorders. It is important to adapt scientific prevention strategies to address the distinct features of

this population, as evidenced by the differences in academic programs and sex. The findings offer a reliable basis for the formulation of university policies and regulations regarding mental health promotion in education, strengthening support networks such as peer support and evidence-based early intervention initiatives that facilitate the good mental health of young people in their academic environments.

CONCLUSION

This study adds to the evidence indicating that motivations for alcohol use are significantly related to problematic alcohol use among university students in Ecuador, and the Duncan-Brown CAGE total score is moderately correlated with CAGE ($\rho = 0.291$; $p<0.001$). Overall, the sample had relatively high social and enhancement motives, and alcohol consumption may be instrumentally related to recreational and 'social integration' purposes and not related to psychological distress. However, social integration motives, even when combined with a high school workload, are not without risk. Mean scores were higher on both measures for boys than for girls, and broader sociocultural dynamics exist that reinforce the norms of alcohol consumption in males and necessitate sex-specific interventions for prevention. Differential findings also show that medical students have higher risk and motivational scores than psychology students, suggesting that the environment, curriculum stress, and disciplinary culture have an impact on consumption behaviors. The results highlight the value of providing differentiated prevention interventions based on evidence within university contexts that are considered the functional basis for drinking among various student subgroups. Interventions should focus on emotional regulation and stress management skills, along with promoting alcohol-free social health, especially in high-risk faculties. The results further underscore the need to use CAGE and CMCA as complementary screening tools to identify students at risk in campus health services. The current study recommends using longitudinal designs and sampling additional Ecuadorian universities to promote generalizability in future studies. Qualitative methods would offer a better understanding of the culture and context that influence alcohol use in this population and inform more locally relevant and effective public health policies at the institutional level.

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CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest in relation to the research, authorship, or publication of this article.

AUTHORS' CONTRIBUTIONS

Author	Contribution
Verónica Freire	Conceptualization, methodological design, literature review, data collection, statistical analysis, table creation, initial drafting, critical review, and final editing.
Ramiro Torres	Methodological validation, statistical analysis, review of results and discussion, and document editing.
Belén Guevara	Supplementary bibliographic review, text structuring, style

	correction, and adaptation to publication standards.
All Authors	Approved the final version of the manuscript and assumed full responsibility for the published content.

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