

Article

Drug Use, Mental Health, and Gender Identity Among Mexican University Students

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Abstract

Drug use, mental health, and gender identity are complex phenomena influenced by multiple social, psychological, and cultural factors. Previous research indicates that the university stage represents a period of vulnerability for mental health, especially among students whose gender identity differs from the traditional categories of man or woman. This study aimed to examine the association between gender identity, drug use, and symptoms of anxiety and depression among students at a public university in Mexico. A cross-sectional correlational study was conducted through a public invitation survey among undergraduate students enrolled in a public university in Mexico. Data were collected using the Drug Use Questionnaire for University Students administered through the LimeSurvey platform. Variables included sociodemographic characteristics, gender identity (man, woman, and other identity), drug use, and symptoms of anxiety and depression. The results indicate that students who identified with another gender identity showed a higher likelihood of using the substances analyzed compared with those who identified as women, particularly prescription drugs and marijuana. Additionally, they presented higher odds of reporting anxiety and depressive symptoms compared with those who identified as men. These findings highlight the need for targeted prevention and support strategies to improve mental health among students with diverse gender identities.

Keywords: gender identity; drug use; anxiety; depression; university students

1. Introduction

Drug use, mental health, and gender identity are phenomena that have been studied across disciplines such as psychology, anthropology, and sociology.

The university stage represents a transitional period characterized by increased autonomy, separation from family, new academic responsibilities, identity development, and changes in social relationships [1,2]. This developmental phase has been identified as a period of increased vulnerability to psychoactive substance use.

Previous research has established that attending university may constitute a risk period for substance use due to multiple interacting factors, including low risk perception, stereotypes associated with youth, the need for peer belonging, influence of friends and classmates, changes in social life, the search for new sensations, stress derived from academic demands, migration away from the family home, and perceived control over substance effects [3–7].



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In addition, anxiety and depressive symptoms—considered in this study under the construct of mental health—have been associated with this transitional stage, particularly among students who migrate or experience discrepancies between expectations and the realities of university life [3,5–7]. Screening instruments such as the Goldberg Anxiety and Depression Scale have been widely used to detect psychological distress in non-clinical populations [8–10].

According to the APA Guidelines [11], gender identity refers to a deeply felt and inherent sense of one's gender, which may or may not align with the sex assigned at birth. In this manuscript, the term “another gender identity” refers to students who self-identify in a gender category different from man or woman, as defined in the survey instrument.

Despite growing international evidence on substance use and mental health among sexual minorities, studies focusing specifically on gender identity—particularly in Latin American university contexts—remain scarce. Moreover, few studies have simultaneously examined substance use patterns alongside anxiety and depressive symptoms within a unified analytical framework.

While sexual orientation and gender identity are distinct constructs, existing literature often groups them under broader sexual and gender minority frameworks. In this study, we focus specifically on gender identity, while drawing on related evidence to contextualize disparities in mental health and substance use.

The Minority Stress Model [12] provides a theoretical framework for understanding disparities in mental health and substance use among individuals with another gender identity. This model proposes that exposure to stigma, discrimination, social rejection, and structural inequality generates chronic stressors that negatively affect psychological well-being. Such stressors increase vulnerability to anxiety and depression [13], which have been associated with alcohol, tobacco, and other drug use. Importantly, these disparities are not attributable to inherent individual characteristics, but rather to structural and social conditions, including exclusion, institutional discrimination, inequality of opportunities, and lack of social support [12,14].

The Minority Stress Model provides a theoretical lens linking structural stigma and discrimination to increased psychological distress and substance use among gender-diverse individuals. From this perspective, examining gender identity alongside mental health and substance use allows for the identification of potential disparities rooted in social and structural conditions.

Empirical evidence has documented higher prevalence of substance use among populations with another gender identity. Han et al., using data from the 2015–2017 National Survey on Drug Use and Health in the United States, found significantly higher prevalence of cannabis use, alcohol consumption, misuse of prescription opioids, and tranquilizer use among sexual minority populations [15]. Similarly, Schuler, Dick, and Stein reported higher rates of lifetime painkiller misuse among sexual minorities compared to heterosexual individuals [16]. Evans-Polce et al. found that substance use and comorbid psychiatric disorders were more prevalent among individuals identifying with another gender identity, emphasizing the frequent co-occurrence of mood, anxiety, and post-traumatic stress disorders [17].

Research also indicates that students with another gender identity face increased substance use risk influenced by personal, family, and social factors, including rejection and homophobia [18,19]. Concealment of sexual orientation or gender identity due to fear of rejection has been associated with increased psychological distress [20]. Family rejection represents a significant risk factor, whereas family acceptance functions as a protective factor for mental health outcomes [21]. In university settings, lower institutional belonging and social isolation have been associated with greater substance use risk [22].

Additionally, certain socialization contexts associated with another gender identity may involve increased exposure to substance use environments, contributing to normalization and availability [23]. Experiences of discrimination, microaggressions, and social exclusion have been associated with higher levels of anxiety, depression, and stress [24–26].

In Mexico, a multicenter study conducted by Rentería et al. among 7874 first-year university students found that students identifying as sexual minorities had between 2.22 and 5.32 times higher probability of developing mental and substance use disorders compared to heterosexual students [27]. National research has also documented associations between discrimination related to sexual orientation and increased psychological distress [28–30]. These findings support the relevance of examining disparities within Mexican university populations.

Taken together, the literature supports the Minority Stress Model as a framework for understanding disparities in mental health and substance use among students with another gender identity. However, limited research has simultaneously examined legal and illegal drug use alongside anxiety and depressive symptoms in Mexican university populations.

This study does not directly assess structural inequalities; however, it examines patterns that may reflect disparities associated with gender identity. It contributes to the literature by providing empirical evidence from a large sample of students at a Mexican university, integrating gender identity, substance use patterns, and mental health indicators within a unified analytical framework.

Therefore, the aim of this study was to analyze the association between self-identified gender category (man, woman, another gender identity), legal and illegal drug use, and the presence of anxiety and depressive symptoms among university students in Mexico.

2. Materials and Methods

This study is based on the Third Diagnostic Assessment of Perception, Risk, and Drug Use among University Students, conducted by the Veracruz Research Network on Addictions (REVIVA). The research was conducted at Universidad Veracruzana (UV), a public higher education and research institution founded in 1944 in Veracruz, Mexico. The university operates across the five administrative regions of the state: Xalapa, Veracruz, Poza Rica–Tuxpan, Córdoba–Orizaba, and Coatzacoalcos–Minatitlán. With a presence in 27 municipalities, UV offers undergraduate, technical, and graduate programs in six academic areas: Arts; Biological and Agricultural Sciences; Health Sciences; Economic–Administrative Sciences; Humanities; and Engineering. According to the Institutional Development Office of UV in its Historical Statistical Series 2016–2017 to 2025–2026, at the time the survey for this study was conducted, the university had 72,946 students enrolled in undergraduate and technical programs.

The Third Diagnostic Assessment employed a cross-sectional correlational design. The inclusion criteria were being an undergraduate or technical-level student, and being enrolled during the February–September 2022 academic period in any region, academic area, faculty, or semester.

A non-probability sampling strategy was used through an open survey invitation. All students were invited to participate through their institutional email accounts. The study was widely disseminated through social media platforms (Facebook, Twitter, and Instagram) and mass communication channels (radio, television, and institutional newsletters) under the campaign name Percíbete (“Know Yourself”), an institutional initiative designed to promote self-awareness among university students. Due to the sampling strategy employed, and consistent with the diagnostic assessments conducted in 2012 and 2017, this study does not constitute a representative sample of the entire student population. However, the large sample size allows for a meaningful analysis of the phenomenon under

study, enabling the identification of trends and the proposal of strategies for intervention. Consequently, the results provide useful evidence to support institutional decision-making.

To emphasize that this was the third edition of the diagnostic assessment, the final letter in the word Percíbet was replaced with the number 3 (Percíbet3), accompanied by the slogan “For me, for you, for my community.”

The variables included in this analysis were sex, age, marital status, children, belonging to an indigenous community, migration for educational purposes, place of residence, employment status, economic situation, academic area, gender identity, drug use (lifetime, past 12 months, and past 30 days), and symptoms of anxiety and depression. The gender identity variable was incorporated for the first time in the 2022 diagnostic assessment and included three categories—man, woman, and other gender identity—based on participants’ self-identification.

The instrument used was the Drug Use Questionnaire for University Students, third version (CODEU-3) [31]. This instrument was developed based on a review of the available scientific literature and has been progressively updated in each diagnostic assessment to incorporate variables relevant to understanding substance use among university students. The CODEU-3 was validated through a pilot study using Cronbach’s alpha, indicating adequate internal consistency. The questionnaire includes 278 items exploring drug use, psychosocial factors identified in the scientific literature as risk factors for substance use, and the presence of symptoms associated with mental health conditions such as anxiety and depression.

To assess these symptoms, validated screening instruments were used. Screening tools represent an effective strategy in primary care and mental health contexts because they are standardized, easy to administer, and enable early detection, thereby facilitating timely interventions. Symptoms of anxiety and depression were assessed using the Goldberg Anxiety and Depression Scales [8]. The anxiety scale consists of nine dichotomous items (Yes/No) analyzed according to the criteria proposed by Martín [10]. The depression scale—translated into Spanish by Montón et al. (1993) [32] and later adapted for the Mexican population by González et al. (2004) [33]—also consists of nine dichotomous items.

After data collection was completed, the dataset was cleaned, validated, and coded for subsequent analyses at the overall, regional, and academic area levels, based on previously defined indicators.

2.1. Statistical Analysis

For descriptive analysis, Chi-square tests were performed for nominal variables and the Kruskal–Wallis H test was applied to the numerical variable age. Statistical significance was established at $p < 0.05$. All analyses were conducted using IBM SPSS version 26. Additionally, associations between variables were evaluated by calculating odds ratios (ORs) and their confidence intervals, using the statistical software R version 4.3.1.

2.2. Ethical Considerations

The Percíbet3 study was reviewed and approved by the Research Ethics Committee of the Institute of Health Sciences at Universidad Veracruzana, recognized by the Mexican National Bioethics Commission (CONBIOÉTICA) under approval number 007/2022. Participation was entirely voluntary and anonymous. Students were able to participate from any device and location by accessing the survey platform through an electronic link or QR code distributed via institutional email accounts, social media platforms, and informational posters. The platform offered an interactive experience in which participants received feedback regarding psychosocial risk factors based on their responses. This feedback was organized using a traffic-light system: students who were not at risk were encouraged

to maintain their current behaviors; those identified as having low risk received brief recommendations; and those identified as having high risk were provided with guidance on where and how to seek professional support. Upon completion of the questionnaire, the participants received a region-specific directory of services where they could obtain counseling, care, or treatment related not only to substance use, but also to other aspects affecting mental health, both within and outside the university.

3. Findings

A total of 19,151 university students from all academic areas, faculties, and semesters participated in the study. Most participants identified as women (59%), followed by men (36%), while 5% reported identifying with another gender identity.

3.1. Sociodemographic Characteristics and Gender Identity

Except for age and belonging to an indigenous people, the comparative analysis of sociodemographic characteristics across gender identity groups revealed statistically significant differences.

The highest proportion of students identifying as men and women belonged to the Economic–Administrative academic area (34.57% and 35.88%, respectively), whereas students identifying with another gender identity (29.64%) were primarily concentrated in the Health Sciences area, a difference that was statistically significant (Table 1).

The median age of participants was 20 years. Most students were single, although 4.89% of those identifying with another gender identity reported living in a consensual union. Most students did not have children (96.61%), with the lowest proportion observed among students identifying with another gender identity. Only a small proportion of participants identified as belonging to an indigenous people. Although no statistically significant differences were observed across the three gender identity groups, the slightly higher proportion among students identifying with another gender identity highlights the importance of considering sociocultural diversity when analyzing gender identities. Migration for educational purposes was more common among students identifying with sexual and gender minorities (34.09%) than among those identifying as men or women. Regarding living arrangements, most students identifying as men or women reported living with their families, whereas the highest proportion of students identifying with another gender identity reported living with friends or alone.

A higher proportion of students identifying as men reported being employed (36.32%). Only a small proportion of participants reported having a poor (11.02%) or very poor (1.12%) economic situation, with these conditions being more frequent among students identifying with another gender identity, 17.37% of whom reported a poor or very poor economic situation (Table 1).

Table 1. Sociodemographic characteristics of university students according to gender identity.

Characteristic	Gender Identity								<i>p</i>
	Man <i>n</i> = 6914		Woman <i>n</i> = 11,316		Another <i>n</i> = 921		Total <i>N</i> = 19,151		
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Academic area ^a									
Arts	53	0.77	117	1.03	28	3.04	198	1.03	<0.001 *
Biological–Agricultural	438	6.33	608	5.37	68	7.38	1114	5.82	
Health Sciences	1454	21.03	3289	29.07	273	29.64	5016	26.19	
Economics and Administration	2390	34.57	4060	35.88	252	27.36	6702	35	
Humanities	604	8.74	1561	13.79	143	15.53	2308	12.05	
Technical	1975	28.57	1681	14.86	157	17.05	3813	19.91	

Table 1. Cont.

Gender Identity									
Characteristic	Man <i>n</i> = 6914		Woman <i>n</i> = 11,316		Another <i>n</i> = 921		Total <i>N</i> = 19,151		<i>p</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Age ^b	20 ^c	21–18 ^d	20 ^c	21–18 ^d	20 ^c	21–18 ^d	20 ^c	21–18 ^d	0.272
Marital status ^a									<0.001 *
Single	6689	96.75	10,837	95.77	871	94.57	18,397	96.06	
Married	96	1.39	207	1.83	5	0.54	308	1.61	
Common-law partnership	129	1.87	272	2.4	45	4.89	446	2.33	
Children ^a									<0.001 *
Yes	187	2.7	454	4.01	9	0.98	650	3.39	
No	6727	97.3	10,862	95.99	912	99.02	18,501	96.61	
Belonging to an indigenous people ^a									0.319
Yes	273	3.95	459	4.06	46	4.99	778	4.06	
No	6641	96.05	10,857	95.94	875	95.01	18,373	95.94	
Change of residence due to admission to university ^a									0.003 *
Yes	1946	28.15	3195	28.23	314	34.09	5455	28.48	
No	4498	65.06	7376	65.18	545	59.17	12,419	64.85	
I haven't moved due to the pandemic	470	6.8	745	6.58	62	6.73	1277	6.67	
Household unit ^a									<0.001 *
Family	5406	78.2	3388	78.4	483	73.4	14,952	78.1	
Friends	267	3.9	672	5.9	59	6.4	998	5.2	
Couple	92	1.3	252	2.2	27	2.9	371	1.9	
Alone	1030	14.9	1191	10.5	130	14.1	2351	12.3	
Other	119	1.7	331	2.9	29	3.1	479	2.5	
Employment status ^a									<0.001 *
Currently employed	2511	36.32	3359	29.68	294	31.92	6164	32.19	
Currently not employed	4403	63.68	7957	70.32	627	68.08	12,987	67.81	
Economic situation ^a									<0.001 *
Very good	93	1.35	128	1.13	8	0.87	229	1.2	
Good	1416	20.48	2483	21.94	164	17.81	4063	21.22	
Regular	4403	63.68	7543	66.66	589	63.95	12,535	65.45	
Bad	904	13.07	1066	9.42	140	15.2	2110	11.02	
Very bad	98	1.42	96	0.85	20	2.17	214	1.12	

Note: Size of the subgroups (*n*); Total sample size (*N*); ^a Chi-square test was conducted; ^b Kruskal–Wallis test was conducted; ^c Median (the median was reported because the assumption of normality of the variable was not met); ^d Interquartile range (IQR); * Statistically significant at *p* < 0.05.

3.2. Drug Use and Gender Identity

Regarding the prevalence of legal drug use (tobacco and alcohol), marijuana, medical drugs, and other illegal drugs (cocaine, hallucinogens, inhalants, methamphetamines, and heroin) measured as lifetime use, use in the past 12 months, and use in the past 30 days, statistically significant differences were observed according to gender identity. Students identifying with another gender identity reported the highest prevalence across all substances and across the three consumption periods. In contrast, students identifying as women reported the lowest prevalence of substance use for most drugs, except for alcohol consumption, where women showed slightly higher prevalence than men in lifetime use and use during the past 12 months. Notably, the prevalence of illegal drug use during the past 12 months and the past 30 days among students identifying with another gender identity was, in many cases, three times higher than that reported by women (Table 2).

Table 2. Drug use at some point in life, in the last 12 months, and in the last 30 days among university students according to gender identity.

Drug	Gender Identity						Total		p
	Man		Woman		Another		N = 19,151		
	n = 6914		n = 11,316		n = 921				
	n	%	n	%	n	%	n	%	
Tobacco ^a									
At some point in life	2561	37.0	3388	29.9	483	52.4	6432	33.6	<0.001 *
Last 12 months	1213	17.5	1417	12.5	269	29.2	2899	15.1	<0.001 *
Last 30 days	819	11.8	860	7.6	181	19.7	1860	9.7	<0.001 *
Alcohol ^a									
At some point in life	4242	61.4	6965	61.6	694	75.4	11,901	62.1	<0.001 *
Last 12 months	3339	48.3	5536	48.9	582	63.2	9457	49.4	<0.001 *
Last 30 days	2284	33.0	3568	31.5	400	43.4	6252	32.6	<0.001 *
Marijuana ^a									
At some point in life	1157	16.7	1212	10.7	236	25.6	2605	13.6	<0.001 *
Last 12 months	626	9.1	599	5.3	147	16.0	1372	7.2	<0.001 *
Last 30 days	360	5.2	335	3.0	84	9.1	779	4.1	<0.001 *
Medical drugs ^a									
At some point in life	174	2.5	212	1.9	54	5.9	440	2.3	<0.001 *
Last 12 months	77	1.1	111	1.0	30	3.3	218	1.1	<0.001 *
Last 30 days	41	0.6	61	0.5	16	1.7	118	0.6	<0.001 *
Illegal drugs ^{a,b}									
At some point in life	1173	17.0	1228	10.9	239	26.0	2640	13.8	<0.001 *
Last 12 months	659	9.5	618	5.5	153	16.6	1430	7.5	<0.001 *
Last 30 days	371	5.4	345	3.0	90	9.8	806	4.2	<0.001 *

Note: Size of the subgroups (n); Total sample size (N); ^a Chi-square test was conducted; ^b The Illegal Drugs category includes cocaine, hallucinogens, inhalants, methamphetamines, and heroin; * Statistically significant at $p < 0.05$.

3.3. Mental Health and Gender Identity

Regarding mental health variables, Table 3 presents the results for symptoms of anxiety and depression. Students identifying with another gender identity showed the highest scores on both psychometric scales, whereas students identifying as men reported the lowest levels. These differences were statistically significant.

Table 3. Mental health and gender identity in university students.

Factor	Gender Identity						Total N = 19,151		p
	Man n = 6914		Woman n = 11,316		Another n = 921		n	%	
	n	%	n	%	n	%			
Anxiety ^a									
With symptoms	3263	47.2	7440	65.7	724	78.6	11,427	59.7	<0.001 *
Without symptoms	3651	52.8	3876	34.3	197	21.4	7724	40.3	
Depression ^a									
With symptoms	4687	67.8	8897	78.6	823	89.4	14,407	75.2	<0.001 *
Without symptoms	2227	32.2	2419	21.4	98	10.6	4744	24.8	

Note: Size of the subgroups (n); Total sample size (N); ^a Chi-square test was conducted; * Statistically significant at $p < 0.05$.

Figure 1 presents the comparisons of odds ratios (ORs) for the association between gender identity and the prevalence of tobacco, alcohol, marijuana, medical drug, and illegal

drug use across the three time frames (lifetime, past 12 months, and past 30 days), as well as symptoms of anxiety and depression.

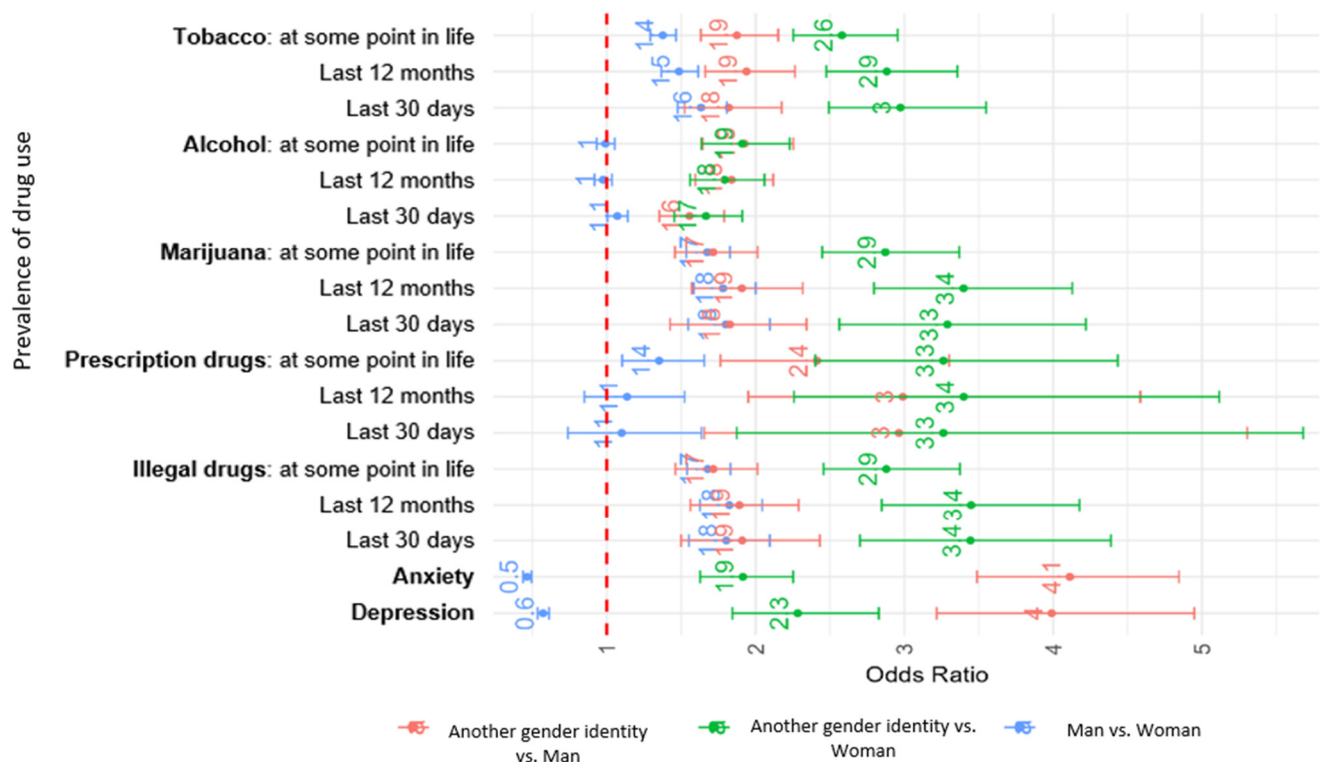


Figure 1. Odds ratios and confidence intervals according to sexual diversity, drug use, and mental health.

When comparing students identifying with another gender identity with those identifying as men, all OR confidence intervals were located to the right of 1 and did not include 1, indicating that individuals belonging to the other gender identity group were more vulnerable to substance use. Medical drug use showed the strongest association, with students identifying with another gender identity having 2.99, 2.96, and 2.41 times higher odds of use during the past 12 months, the past 30 days, and in their lifetime, respectively. Regarding mental health outcomes, students identifying with another gender identity were 4.11 times more likely to report symptoms of anxiety and 3.99 times more likely to report symptoms of depression compared with male students.

When comparing students identifying with another gender identity with those identifying as women, a similar pattern was observed. All OR confidence intervals were also located to the right of 1, and the OR values were even higher than those observed in the comparison with men. This indicates that belonging to another gender identity group represents a greater likelihood of substance use compared with students identifying as women. The highest odds were observed for marijuana use (OR = 3.40), medical drug use (OR = 3.44), and illegal drug use (OR = 3.45) during the past 12 months, with a similar pattern observed for illegal drug use during the past 30 days (OR = 3.44). Regarding mental health outcomes, students identifying with another gender identity showed higher odds of anxiety symptoms (OR = 2.15) and depression symptoms (OR = 2.28).

In contrast, when comparing male and female students, no statistically significant differences were observed in medical drug use during the past 12 months or the past 30 days, nor in alcohol use across the three time frames (lifetime, past 12 months, and past 30 days). However, men showed higher odds of using other drugs compared with women.

Regarding mental health outcomes, men were less likely to report symptoms of anxiety and depression than women.

4. Discussion

The aim of this study was to analyze the association between self-identified gender identity, psychoactive substance use, and symptoms of anxiety and depression among Mexican university students. The findings indicate that students identifying with another gender identity present higher prevalence of substance use, including tobacco, alcohol, marijuana, non-prescribed medical drugs, and illegal drugs, as well as higher probabilities of reporting symptoms of anxiety and depression, compared with students identifying as men or women. Furthermore, the association analyses showed that belonging to another gender identity group significantly increases the likelihood of substance use and of experiencing psychological distress, highlighting a consistent and compounded pattern of risk that underscores substantial mental health vulnerability in gender-diverse populations.

As discussed in this study and supported by previous research, the phenomenon of drug use and addiction is highly complex and has become a public health problem involving multiple biological, psychological, social, and cultural factors [34–36]. Regarding risk factors specifically affecting university populations, previous research indicates that the transition to university life represents a period of significant change associated with greater personal autonomy, the reconfiguration of social networks, and new academic and social demands [1,2]. Some studies suggest that this stage constitutes a period of increased vulnerability to substance use due to factors such as peer influence, the search for new experiences, low risk perception, and changes in social and family dynamics, among others [3–7]. In this sense, the patterns of substance use observed in the present study are consistent with trends previously documented in university populations, although with marked differences according to gender identity.

A meta-analysis of population-based studies indicated that individuals belonging to gender-diverse minorities have approximately 1.5 times greater risk of substance dependence within a 12-month period compared with individuals with binary gender identities [37]. Additional studies have also documented elevated rates of substance use and substance use disorders among sexual and gender minority populations [38,39].

These findings are consistent with the results of the present study, which also show that students identifying with another gender identity report higher probabilities of experiencing symptoms of anxiety and depression. This finding aligns with previous research documenting a higher prevalence of psychological distress during the university period, particularly among students experiencing migration for academic purposes or discrepancies between their expectations and the actual conditions of university life [3,5–7]. In this context, screening instruments widely used in non-clinical populations, such as the Goldberg Anxiety and Depression Scale, have enabled the identification of relevant levels of psychological distress among university students [8–10], highlighting the importance of assessing mental health within this population.

The interpretation of these findings can be situated within the framework of the Minority Stress Model, which proposes that individuals belonging to sexual and gender minorities experience additional social stressors related to stigma, discrimination, and structural exclusion [12–14]. These stressors create conditions of psychological vulnerability that increase the risk of developing symptoms of anxiety and depression and, in some cases, may lead to maladaptive coping strategies, such as the use of psychoactive substances. In this context, although these factors were not directly examined in the present study, the observed differences should not be interpreted as inherent to gender identity; rather, they

may reflect the influence of broader social environments that can generate inequalities in health and well-being.

In marginalized populations, maladaptive coping strategies—such as the use of alcohol and other drugs—have been described as responses to chronic stress, discrimination, and violence. In this context, a growing body of research has documented consistent associations between exposure to adverse social stressors and increased substance use across vulnerable groups. Specifically, some studies conducted among sexual minority populations indicate that structural stigma, exposure to violence, and cumulative stress are linked to higher levels of substance use and poorer mental health outcomes, supporting the notion that substance use may serve as a coping response to sustained psychological distress [40,41]. These findings are consistent with the results of the present study, in which higher substance use among students identifying with another gender identity is accompanied by higher levels of anxiety and depression.

Recent research has consistently documented the interrelationship between mental health and broader indicators of well-being in university populations. Studies conducted among college students have shown that psychological distress—particularly symptoms of anxiety and depression—is closely linked to academic stressors, reduced well-being, and health-related behaviors, including substance use [42–44]. These findings support the importance of situating substance use within a broader framework of health, in which psychological and behavioral factors are interconnected and may influence one another within the university context.

Incorporating an intersectional perspective allows for a deeper interpretation of these results. Intersectionality theory posits that social inequalities do not operate independently; rather, different systems of oppression—such as gender, sexual orientation, and socioeconomic conditions—may overlap and amplify their effects on health [45,46]. In the case of women who also belong to sexual and gender minorities, this intersection may generate specific forms of vulnerability by combining experiences of gender discrimination with those related to identity or sexual orientation. In university contexts, these dynamics may manifest as lower levels of social support, greater exposure to stigmatization, or difficulties with institutional integration—factors that have been associated with an increased risk of mental health problems and substance use [47–49]. It should be noted that international evidence indicates that drug use levels tend to be higher among men than among women, except in the case of alcohol, where consumption patterns are becoming increasingly similar [50,51].

Moreover, the results suggest that university students identifying with another gender identity not only present higher levels of substance use, but also sociodemographic conditions that may intensify their vulnerability, such as higher rates of migration for educational purposes and more precarious economic situations, as observed in the findings of the present study. The interaction between these structural factors may help explain the higher likelihood of substance use and psychological distress observed in this group.

Another relevant finding indicates that the highest probabilities of substance use among students identifying with another gender identity were observed for non-prescribed medical drugs, marijuana, and illegal drugs during the past 12 months and the past 30 days. This pattern may reflect self-medication behaviors associated with untreated symptoms of anxiety or depression. When access to mental health services is limited or when barriers related to stigma persist, some students may resort to medications or psychoactive substances as strategies for emotional regulation.

From an applied perspective, these findings highlight the potential relevance of strengthening university-based counseling and support services that are responsive to the needs of gender-diverse students. Approaches that integrate mental health care with substance use prevention, while providing gender-affirming and inclusive environments,

may be particularly important. Although the present study did not assess intervention outcomes, the observed co-occurrence of psychological distress and substance use suggests the need for preventive strategies and early support programs within university settings.

Finally, the authors recommend that readers consider certain limitations when interpreting these results. First, the cross-sectional design prevents the establishment of causal relationships between the analyzed variables. Second, the non-probability sampling strategy limits the generalizability of the findings to the entire Mexican university population. Additional limitations derive from the use of self-reported data, which may introduce recall bias or social desirability bias, although responses were collected anonymously. Perhaps the most important limitation is that the category “other gender identity” groups multiple gender identities into a single analytical category, preventing the examination of potential differences within this population. Future research should include adjusted odds ratio analyses that incorporate additional factors influencing the variables of interest.

5. Conclusions

The findings of this study highlight significant inequalities in psychoactive substance use and symptoms of anxiety and depression among Mexican university students according to gender identity. Students identifying with another gender identity show higher probabilities of consuming both legal and illegal substances and of reporting psychological distress compared with those identifying as men or women. These results suggest that experiences associated with belonging to sexual and gender minorities may be shaped by stigma, discrimination, and other forms of social exclusion, which may contribute to increased vulnerability to mental health problems and lower levels of well-being.

Overall, this study contributes to expanding the empirical evidence on inequalities in mental health and substance use among university students belonging to sexual and gender minorities in Mexico, an area that remains relatively underexplored compared with other international contexts. Furthermore, these findings highlight the need for institutional strategies that promote more inclusive university environments, strengthen access to mental health services, and reduce risk factors associated with substance use among students, while incorporating approaches that acknowledge and address gender identity diversity.

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References

1. National Research Council; Institute of Medicine. *Preventing Mental, Emotional, and Behavioral Disorders Among Young People: Progress and Possibilities*; National Academies Press: Washington, DC, USA, 2009. [CrossRef]
2. López, M.; Kuhne, W.; Pérez, P.; Gallero, P.; Matus, O. Características de consultantes y proceso terapéutico de universitarios en un servicio de psicoterapia. *Rev. Iberoam. Psicol. Cienc. Tecnol.* **2010**, *3*, 99–107.
3. Cáceres, D.; Salazar, I.; Varela, M.; Tovar, J. Consumo de drogas en jóvenes universitarios y su relación con factores psicosociales de riesgo y protección. *Univ. Psychol.* **2006**, *5*, 521–534.
4. Charro, B.; Meneses, C.; Cerro, P. Motivos para el consumo de drogas legales y su relación con la salud en adolescentes madrileños. *Rev. Esp. Drogodepend.* **2012**, *37*, 257–266.
5. Salas-García, B.; De-San-Jorge-Cárdenas, X.; Beverido-Sustaeta, P.; Carmona-Avendaño, Y. La migración interna en estudiantes universitarios: ¿un riesgo para el consumo de drogas? *CienciaUAT* **2016**, *10*, 23–32. [CrossRef]
6. Saltos, S.M. Estudio del consumo de drogas en estudiantes universitarios. *Rev. Cienc. UNEMI* **2011**, *4*, 8–17. [CrossRef]
7. Méndez, G.J.M.; Azaustre, L.M.C. El consumo de alcohol en universitarios: Estudio de las relaciones entre las causas y los efectos negativos. *Rev. Complut. Educ.* **2017**, *28*, 689–704. [CrossRef]
8. Goldberg, D.; Bridges, K.; Duncan-Jones, P. Detection of anxiety and depression in general medical settings. *Br. Med. J.* **1989**, *4*, 49–53. [CrossRef]
9. Kiely, K.M.; Butterworth, P. Validation of four measures of mental health against depression and generalized anxiety in a community based sample. *Psychiatry Res.* **2015**, *28*, 291–298. [CrossRef]
10. Martín, C.M. Valor diagnóstico de la escala de ansiedad y depresión de Goldberg (EAD-G) en adultos cubanos. *Univ. Psychol.* **2016**, *15*, 15–29. [CrossRef]
11. American Psychological Association. Guidelines for psychological practice with transgender and gender diverse people. *Am. Psychol.* **2021**, *76*, 474–500. [CrossRef]
12. Meyer, I.H. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations. *Psychol. Bull.* **2003**, *129*, 674–697. [CrossRef]
13. Hatzenbuehler, M.L. How does sexual minority stigma get under the skin? A psychological mediation framework. *Psychol. Bull.* **2009**, *135*, 707–730. [CrossRef]
14. Zhang, L.; Qiu, S.S.; Zhao, X.; Ao, S.H.; Wang, Z.C. Invisible minority stress and addictive behaviors: Disparities in psychological distress and e-cigarette use among lesbian, gay, and bisexual adults in China. *BMC Psychol.* **2026**, *14*, 311. [CrossRef]
15. Han, B.H.; Miyoshi, M.; Palamar, J.J. Substance use among middle-aged and older lesbian, gay, and bisexual adults in the United States, 2015–2017. *J. Gen. Intern. Med.* **2020**, *35*, 3740–3741. [CrossRef]
16. Schuler, M.S.; Dick, A.W.; Stein, B.D. Sexual minority disparities in opioid misuse and heroin risk among US adults. *Drug Alcohol Depend.* **2019**, *201*, 78–84. [CrossRef]
17. Evans-Polce, R.J.; Kcomt, L.; Veliz, P.T.; Boyd, C.J.; McCabe, S.E. Alcohol, tobacco and psychiatric disorders associated with sexual identity. *Am. J. Psychiatry* **2020**, *177*, 1073–1081. [CrossRef] [PubMed]
18. Rocha, J.C. Una mirada histórica y cultural del movimiento LGBTTTI mexicano. *Roman. Notes* **2014**, *54*, 263–273. [CrossRef]
19. Guevara, J. Consumos y población LGBTI+: ¿qué se sabe hasta ahora? In *XIV Jornadas de Sociología*; Universidad de Buenos Aires: Buenos Aires, Argentina, 2021. Available online: <https://www.aacademica.org/000-074/574> (accessed on 27 March 2026).
20. Pachankis, J.E. The psychological implications of concealing a stigma. *Psychol. Bull.* **2007**, *133*, 328–345. [CrossRef] [PubMed]
21. Ryan, C.; Russell, S.T.; Huebner, D.; Diaz, R.; Sanchez, J. Family acceptance in adolescence and health of LGBT young adults. *J. Child Adolesc. Psychiatr. Nurs.* **2010**, *23*, 205–213. [CrossRef]
22. Woodford, M.R.; Kulick, A.; Garvey, J.C.; Sinco, B.R.; Hong, J.S. LGBTQ policies and resources on campus and the experiences and psychological well-being of sexual minority college students: Advancing research on structural inclusion. *Psychol. Sex. Orientat. Gend. Divers.* **2018**, *5*, 445–456. [CrossRef]
23. Green, K.E.; Feinstein, B.A. Substance use in lesbian, gay, and bisexual populations: An update on empirical research and implications for treatment. *Psychol. Addict. Behav.* **2012**, *26*, 265–278. [CrossRef]
24. Marshal, M.P.; Dermody, S.S.; Cheong, J.; Burton, C.M.; Friedman, M.S.; Aranda, F.; Hughes, T.L. Trajectories of depressive symptoms and suicidality among heterosexual and sexual minority youth. *J. Youth Adolesc.* **2013**, *42*, 1243–1256. [CrossRef] [PubMed]
25. Fish, J.N.; Salerno, J.; Williams, N.D.; Rinderknecht, R.G.; Drotning, K.J.; Sayer, L.; Doan, L. Sexual Minority Disparities in Health and Well-Being as a Consequence of the COVID-19 Pandemic Differ by Sexual Identity. *LGBT Health* **2021**, *8*, 263–272. [CrossRef] [PubMed]
26. Kidd, J.D.; Jackman, K.B.; Wolff, M.; Veldhuis, C.B.; Hughes, T.L. Risk and protective factors for substance use among sexual and gender minority youth: A scoping review. *Curr. Addict. Rep.* **2018**, *5*, 158–173. [CrossRef]
27. Rentería, R.; Benjet, C.; Gutiérrez-García, R.A.; Abrego-Ramírez, A.; Albor, Y.; Borges, G.; Covarrubias Díaz-Couder, M.A.; Durán, M.D.S.; González-González, R.; Guzmán Saldaña, R.; et al. Prevalence of 12-month mental and substance use disorders in sexual minority college students in Mexico. *Soc. Psychiatry Psychiatr. Epidemiol.* **2021**, *56*, 247–257. [CrossRef]

28. Lozano-Verduzco, I.; Fernández-Niño, J.A.; Baruch-Domínguez, R. Association between internalized homophobia and mental health indicators in LGBT individuals in Mexico City. *Salud Ment.* **2017**, *40*, 219–225. [\[CrossRef\]](#)
29. Ortiz-Hernández, L.; García-Torres, M.I. Violence and discrimination and mental health of bisexuals, lesbians and gays. *Cad. Saúde Pública* **2005**, *21*, 913–925. [\[CrossRef\]](#)
30. Ortiz-Hernández, L.; Valencia-Valero, R.G. Disparities in mental health associated with sexual orientation among Mexican adolescents. *Cad. Saude Publica* **2015**, *31*, 417–430. [\[CrossRef\]](#)
31. De San Jorge-Cárdenas, X.; Salas-García, B.; Ortiz-León, M.C.; Arellanez-Hernández, J.L.; Beltrán-Guerra, L.; Beverido-Sustaeta, P.; Ruiz-Libreros, M.E.; García-Méndez, A.; Pavón-León, P.; Blázquez-Morales, M.S.L.; et al. *Cuestionario Sobre Consumo de Drogas en Estudiantes Universitarios: Tercera Versión (CODEU-3)*; Universidad Veracruzana: Veracruz, Mexico, 2022.
32. Montón, C.; Pérez-Echeverría, M.J.; Campos, R.; García-Campayo, J.; Lobo, A. Escalas de ansiedad y depresión de Goldberg: Una guía de entrevista eficaz para la detección del malestar psíquico. *Atención Primaria* **1993**, *12*, 345–349.
33. González, J.D.; García, V.R.; Córdova, A. Uso de sustancias entre adolescentes y su asociación con síntomas de depresión y percepción de sus relaciones familiares. *Cent. Integr. Juv.* **2004**, 1–25.
34. Wiss, D.A. A biopsychosocial overview of the opioid crisis. *Front. Public Health* **2019**, *7*, 193. [\[CrossRef\]](#)
35. Montiel Ishino, F.A.; McNab, P.R.; Gilreath, T.; Salmeron, B.; Williams, F. A comprehensive multivariate model of biopsychosocial factors associated with opioid misuse and use disorder in a 2017–2018 United States national. *BMC Public Health* **2020**, *20*, 1740. [\[CrossRef\]](#) [\[PubMed\]](#)
36. Cadet, J.L.; Jayanthi, S. Epigenetics of addiction. *Neurochem. Int.* **2021**, *147*, 105069. [\[CrossRef\]](#)
37. King, M.; Semlyen, J.; Tai, S.S.; Killaspy, H.; Osborn, D.; Popelyuk, D.; Nazareth, I. A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people. *BMC Psychiatry* **2008**, *8*, 70. [\[CrossRef\]](#)
38. Marshal, M.P.; Friedman, M.S.; Stall, R.; King, K.M.; Miles, J.; Gold, M.A.; Bukstein, O.G.; Morse, J.Q. Sexual orientation and adolescent substance use: A meta-analysis and methodological review. *Addiction* **2008**, *103*, 546–556. [\[CrossRef\]](#) [\[PubMed\]](#)
39. McCabe, S.E.; Hughes, T.L.; Bostwick, W.B.; West, B.T.; Boyd, C.J. Sexual orientation, substance use behaviors and substance dependence in the United States. *Addiction* **2009**, *104*, 1333–1345. [\[CrossRef\]](#)
40. Gilman, S.E.; Cochran, S.D.; Mays, V.M.; Hughes, M.; Ostrow, D.; Kessler, R.C. Risk of psychiatric disorders among individuals reporting same-sex sexual partners in the National Comorbidity Survey. *Am. J. Public Health* **2001**, *91*, 933–939. [\[CrossRef\]](#) [\[PubMed\]](#)
41. Hatzenbuehler, M.L.; Keyes, K.M.; Hasin, D.S. State-level policies and psychiatric morbidity in lesbian, gay, and bisexual populations. *Am. J. Public Health* **2009**, *99*, 2275–2281. [\[CrossRef\]](#)
42. Ibrahim, A.K.; Kelly, S.J.; Adams, C.E.; Glazebrook, C. A systematic review of studies of depression prevalence in university students. *J. Psychiatr. Res.* **2013**, *47*, 391–400. [\[CrossRef\]](#)
43. Stallman, H.M. Prevalence of psychological distress in university students: Implications for service delivery. *Aust. Fam. Physician* **2008**, *37*, 673–677. Available online: <https://europepmc.org/article/MED/18704221> (accessed on 27 March 2026).
44. Pedrelli, P.; Nyer, M.; Yeung, A.; Zulauf, C.; Wilens, T. College students: Mental health problems and treatment considerations. *Acad. Psychiatry* **2015**, *39*, 503–511. [\[CrossRef\]](#)
45. Alvidrez, J.; Greenwood, G.L.; Johnson, T.L.; Parker, K.L. Intersectionality in public health research: A view from the National Institutes of Health. *Am. J. Public Health* **2021**, *111*, 95–97. [\[CrossRef\]](#)
46. Lett, E.; Dowshen, N.L.; Baker, K.E. Intersectionality and health inequities for gender minority Blacks in the U.S. *Am. J. Prev. Med.* **2020**, *59*, 639–647. [\[CrossRef\]](#) [\[PubMed\]](#)
47. Eisenberg, D.; Gollust, S.E.; Golberstein, E.; Hefner, J.L. Prevalence and correlates of depression, anxiety, and suicidality among university students. *Am. J. Orthopsychiatry* **2007**, *77*, 534–542. [\[CrossRef\]](#)
48. Woodford, M.R.; Kulick, A.; Sinco, B.R.; Hong, J.S. Contemporary heterosexism on campus and psychological distress among LGBQ students: The mediating role of self-acceptance. *Am. J. Orthopsychiatry* **2014**, *84*, 519–529. [\[CrossRef\]](#) [\[PubMed\]](#)
49. Oswalt, S.B.; Wyatt, T.J. Sexual orientation and differences in mental health, stress, and academic performance in a national sample of U.S. college students. *J. Homosex.* **2011**, *58*, 1255–1280. [\[CrossRef\]](#)
50. Teixidó-Compañó, E.; Espelt, A.; Sordo, L.; Bravo, M.J.; Sarasa-Renedo, A.; Indave, B.I.; Bosque-Prous, M.; Brugal, M.T. Differences between men and women in substance use: The role of educational level and employment status. *Gac. Sanit.* **2018**, *32*, 41–47. [\[CrossRef\]](#) [\[PubMed\]](#)
51. Verplaetse, T.L.; Carretta, R.F.; Struble, C.A.; Pittman, B.; Roberts, W.; Zakiniaiez, Y.; Peltier, M.R.; McKee, S.A. Gender differences in alcohol use disorder trends from 2009–2019: An intersectional analysis. *Alcohol* **2025**, *123*, 101–107. [\[CrossRef\]](#)

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