



# Intimate Violence: Alcohol and Drug Use, and Mental Health during COVID-19 among Young Mexican Adults

Silvia Morales Chainé<sup>1</sup>, Gonzalo Bacigalupe<sup>2</sup>, Rebeca Robles García<sup>3</sup>, Alma Luisa López Fuentes<sup>1</sup>

<sup>1</sup>Facultad de Psicología, Universidad Nacional Autónoma de México.

<sup>2</sup>Department of Counseling and School Psychology, College of Education and Human Development, University of Massachusetts.

<sup>3</sup>Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz.

## RESUMEN

**Introducción:** Aunque la pandemia por COVID-19 incrementó la violencia en la intimidad de la familia, el uso de sustancias psicoactivas y los riesgos a la salud mental en países de medio y bajo nivel socio económico, se desconocen cuáles fueron las tendencias y la direccionalidad en la relación entre estas conductas y síntomas durante la pandemia en México, sobre todo al considerar los riesgos por grupos de edad y las tendencias de desarrollo. Este estudio describe la tendencia y la direccionalidad en las relaciones entre la violencia, el daño por el uso de alcohol y otras drogas y los riesgos a la salud mental en jóvenes mexicanos durante la COVID-19. **Método:** se utilizó un estudio longitudinal de cohortes respecto a la evolución de grupos de edad con 5,102 mexicanos de 18, 21 y 24 años (con 49% de cumplimiento en las muestras de evolución; por ejemplo, para el primer grupo se seleccionó una muestra de participantes que tenían 18 años en 2021, una muestra de participantes de 19 años en 2022 y una muestra de participantes de 20 años en 2023). **Resultados:** los resultados indicaron que las mujeres, los hombres y los jóvenes de 18 y 22 años que sufrieron de violencia en la intimidad reportaron el uso dañino de alcohol, así como síntomas de depresión, ansiedad, estrés postraumático y la perpetración de la violencia. Los hallazgos también sugieren que el uso dañino de alcohol predijo el daño por uso de tabaco, cannabis y sedantes. Las y los jóvenes adultos reportaron síntomas de depresión por la violencia en la intimidad de la familia. Las y los mexicanos de 19 a 21 años y los de 25 reportaron violencia perpetrada como resultado de la violencia recibida. Durante 2022 y 2023, en particular, los grupos cohorte que se involucraron en el uso dañino de alcohol reportaron el uso de alto riesgo de sedantes. **Discusión y conclusiones:** los hallazgos indican una tendencia al incremento en la violencia en la intimidad de la familia, uso dañino de alcohol y otras drogas y riesgos a la salud mental en jóvenes mexicanos a lo largo de la pandemia. La política pública debe considerar el diseño de estrategias de prevención costo-efectivas para enfrentar la violencia en la intimidad de la familia como una estrategia para reducir el uso dañino de alcohol y mejorar las condiciones de salud mental en los mexicanos.

**Palabras clave:** violencia en la intimidad de la familia, uso de alcohol y otras drogas, salud mental, estudio cohorte, modelamiento de ecuaciones estructurales.

## Corresponding author:

Silvia Morales Chainé

Facultad de Psicología, Universidad Nacional Autónoma de México, C.P. 04510, Ciudad de México. E-mail: [smchaine@comunidad.unam.mx](mailto:smchaine@comunidad.unam.mx)

Received on: February 21st, 2024

Accepted on: April 12nd, 2024

doi: [10.28931/riiad.2024.1.02](https://doi.org/10.28931/riiad.2024.1.02)



## ABSTRACT

**Introduction:** Although the COVID-19 pandemic triggered an increase in intimate violence, drug use, and mental health problems in low- and middle-income countries, these fluctuations and the relationship directionality between these behaviors and symptoms, when comparing group-of-age risks and developmental trends during the pandemic in Mexico, are unclear. This study describes the tendency and relationship directionality between intimate violence, harmful use of alcohol and other drugs, and mental health symptoms among young adults during COVID-19 in Mexico. **Method:** longitudinal cohort of group evolution with 5,102 Mexicans aged 18, 21, and 24 (with 49% of the evolution-age sample accomplishments, e.g., for the first group, we choose a sample of participants of 18 years in 2021, a sample of participants of 19 years in 2022, and a sample of participant of 20 years in 2023). **Results:** women, men, and 18- and 22-year-old youths who had suffered intimate violence reported harmful alcohol use, depression, anxiety, PTSD, and perpetrating violence. They also revealed the harmful use of tobacco, cannabis, and sedative consumption due to risky alcohol use. The oldest young adults also reported depressive symptoms due to intimate violence. The 19 to 21, and 25-year-old youths reported perpetrating violence as a result of intimate violence victimization. During 2022 and 2023, the youngest cohorts engaging in harmful alcohol use also reported risky sedative use. **Discussion and conclusions:** findings reflect an increase in intimate violence, harmful alcohol and other drugs use, and mental health problems among young adults in Mexico during the pandemic. Public policies should consider designing cost-effective preventive interventions to address intimate violence as a strategy for reducing harmful alcohol use and improving mental health conditions.

**Keywords:** intimate violence, alcohol and drug use, mental health, cohort study, structural equation model.

## INTRODUCTION

The COVID-19 pandemic may have increased intimate violence, harmful use of alcohol and other drugs (AOD), and mental health problems in youth in low- and middle-income countries (LMIC; [World Health Organization \[WHO\], 2023](#)). The prevalence and incidence of these conditions have mainly been obtained from separate cross-sectional studies conducted at the start of the pandemic or with earlier data. Our previous cross-sectional Mexican data suggest unclear trends and a one-shot picture of the relationships between violence and alcohol and other drugs (AOD) and mental health symptoms during the pandemic ([Morales-Chainé et al., 2023](#)). Known trends and relationship directionality between violence, AOD use, and mental health symptomatology could contribute to observing the fluctuations of these elements during the pandemic and compare generational risks and developmental trends across three years (cohort groups were selected according to the National Institute of Statistics and Geography age classification ([INEGI, 2021](#); for its acronym in Spanish).

In 2020, the Pan American Health Organization ([PAHO, 2020](#)) reported a rate of 59.82 Years Lived with Disability (YLD; 79.82 in women and 41.18 in men) per 100,000 population due to interpersonal and intimate violence in America. This incidence points to a 5.6% decrease in the global population rate from 2000 to 2019 (with a decrease of 6.8% in women, and 4.0% in men). It is worth noting that the incidence data were obtained prior to the pandemic in America. The exact incidence appears to be replicated in high-income countries. For instance, the United Nations Office on Drugs and Crime Research—Data Portal—Violent and Sexual Crime ([UNODC, 2023](#)) reported a downward trend in intimate violence in Canada from a global rate of 48.81 per 100,000 population (59.85 for women and 37.78 for men) in 2013 to 6.67 (7.98 in women and 5.36 in men) in 2020.

In contrast to what high-income countries have reported, international reports on violence seem to indicate increased or unclear trends of intimate violence in LMIC prior to and at the start of the pandemic. In Mexico, PAHO observed a 20.5% increase in YLD due to intimate violence (35.9% in women and 1.4% in men) between 2000 and 2019 (2020). The global rate was 64.73 per 100,000 population in 2019 (YLD; 86.49 in women and 45.65 in men). However, the UNODC reported fluctuating trends in intimate violence among the Mexican population between 2017 and 2020 (2023). It found rates of intimate violence of 3.21 in 2017, .62 in 2018, 9.12 in 2019, and 3.5

in 2020. Rates for women were 1.96, .42, 12.94, and 5.15, while those for men were 4.47, .83, 5.31, and 1.78 during those same years.

The INEGI identified a four-point increase in lifetime violence against women between 2016 and 2021 (from 66.1% to 70.10%) in Mexico (2021). Based on a transactional study, the National Committee on Addictions ([CONADIC, for its acronym in Spanish; 2021](#)) showed that 2.6% of Mexicans reported experiencing an increase in intimate violence during the initial phase of the pandemic. Data on intimate violence trends in Mexico, therefore, appear to differ between those recorded at the beginning of the pandemic and those obtained in a transactional study. Our last cross-sectional study, preliminary to the actual research, indicated that 25% of Mexican youths suffered from violence in 2022 ([Morales-Chainé et al., 2023](#)). It also suggested how intimate violence is associated with other psychosocial conditions such as harmful AOD use and mental health symptomatology in Mexico, an LMIC.

The UNODC reported a 26% increase in drug use between 2010 and 2020 worldwide (2022). Nevertheless, [Layman et al. \(2022\)](#) suggests that AOD incidence fluctuated between 2020 and 2022 in several countries depending on their income. In Mexico, the National Report on Alcohol and Tobacco issued by the Ramón de la Fuente Muñiz National Institute of Psychiatry ([INPRFM, for its acronym in Spanish; 2016](#)) found increased AOD incidence in adolescents and adults in 2016. It observed that harmful alcohol use rose from 28% in 2011 to 33.6% in 2016 (from 15.5% to 22.6% in women and from 41.3% to 45.5% in men, respectively). The INPRFM also reported increased accumulated incidence of other drug use from 5.7% in 2008 to 10.3% in 2016 (2016). Tobacco use trends appeared to be stable (amounting to 17.0% in 2011 and 17.6% in 2016 and affecting 9.3% and 8.7% of women and 25.2% and 27.1% of men respectively). However, based on a transactional study, CONADIC reported that 19.80%, 18.7%, and 3.1% of Mexicans indicated increased use of alcohol, tobacco and other drugs, respectively, at the beginning of the pandemic (2021). In 2022, our preliminary cross-sectional study indicated that 18.93% of Mexican youths used more than two drugs, including alcohol harmfully ([Morales-Chainé et al., 2023](#)). AOD trends use appeared to increase before the pandemic, but the data are unclear during the pandemic in Mexico.

In regard to mental health, PAHO reported a 4.5% lower incidence in the overall rate of mental health problems per 100,000 population between 2000 and 2019 (4.7% in women and 4.1% in men) for

the American Continent (2021). The rate in 2019 was 1,981.7 per 100,000 population (2,251.1 in women and 1,705.5 in men). The incidence of mental health conditions, however, seemed to be different for LMIC prior to the pandemic. PAHO observed a 6.5% increase in mental health problems between 2000 and 2019 (8.9% in women and 3.2% in men) in Mexico. The rate was 1,716.4 YLD per 100,000 Mexicans in 2019 (1,975.7 for women and 1,438.2 for men). Recently, based on systematic reviews and meta-analyses, WHO suggested that the COVID-19 pandemic led to a 27.6% increase in major depression cases and a 25.6% increase in anxiety disorders in 2021 (2022). Rather than reporting the incidence of mental health problems, the CONADIC survey merely reported the prevalence of anxiety (15.9%) and stress (17.7%) among Mexicans during the first year of the pandemic (2021). Our preliminary cross-sectional study indicated that 44.46%, 47.90, and 29.47% of Mexican youths reported depression, anxiety, and PTSD symptoms respectively, in 2022 (Morales-Chainé et al., 2023).

The recent fluctuations of intimate violence, AOD use, and mental health conditions during the pandemic in Mexico remain unclear. Knowledge about the developmental trends of the relationship directionality between intimate violence, AOD use, and mental health, and the moderating role of sex and age could help improve cost-effective preventive interventions and public mental health policies for treatment (WHO, 2022; White et al., 2023). WHO reported that females, younger people (especially those aged 20-24), and those living in LMIC have been more prone to experiencing intimate violence, harmful AOD use, or mental health symptoms than men, adults, or those living in high-income countries (2023). The extent to which group of age intimate violence is associated with AOD use and mental health symptomatology by sex could also contribute to a better understanding of social phenomena and prevention strategies.

The role of intimate violence in AOD and mental health symptoms has been suggested by pre-pandemic data and studies addressing one or two of these variables in 2020. Brabete et al. (2020) reported the use of alcohol, marijuana, stimulants, and other psychoactive substances and mental health symptomatology as a result of intimate violence. In their transactional studies, Glowacz et al. (2022), Craig et al. (2023), and White et al. (2023) also found that youths experiencing violence at home suffered depression, anxiety, and posttraumatic stress symptoms. In Mexico, with our previous cross-sectional

study based on structured equational model analysis, we explored and suggested that being a young victim of intimate violence predicted harmful use of tobacco, alcohol, cocaine, and sedatives, depression, anxiety, and specific PTSD symptoms (Morales-Chainé et al., 2023). Being a victim of interpersonal violence also seemed to predict avoidance, negative alterations in cognition-mood, and hyperarousal signs. Several studies have conceptualized intimate or interpersonal violence as behaviors causing physical, sexual, or psychological harm, both inside and outside the home (Alexander & Johnson, 2023; Holtzworth-Munroe & Stuart, 1994; Kourti et al., 2023; Oram et al., 2022; Scott-Storey et al., 2023; WHO, 2023; Weathers, Blake et al., 2013) as a one-shot picture, mainly.

Although the incidence of intimate violence, AOD use, and mental health symptoms during the pandemic decreased in high-income countries such as the USA and Canada, trends in these social and mental health conditions are unclear during the pandemic in Mexico, an LMIC. Pre-first-year pandemic and our previous cross-sectional data also suggest an association between violence, AOD use, and mental health symptoms (Morales-Chainé et al., 2023). Describing fluctuations and group-of-age trends of the relationship directionality between these social and mental health conditions and based on a longitudinal cohort of evolution groups moderated by sex could yield a stable path model about how experiencing intimate violence can result in harmful AOD use and mental health symptoms during the pandemic. The study describes the tendency and relationship directionality between intimate violence, harmful use of AOD, and mental health symptoms among young adults as a follow-up of our previous study with new data (Morales-Chainé et al., 2023) through a longitudinal cohort study of group evolution considering sex during COVID-19 in Mexico. Our hypotheses state that intimate violence (Ha1), harmful AOD use (Ha2), and mental health symptoms (Ha3) increased during the pandemic, and that victimizing intimate violence predicts harmful AOD use (Ha4), depression (Ha5), anxiety (Ha6), PTSD symptoms (Ha7), and perpetrating violence (Ha8) relating to group-of-age trends.

## METHOD

We used a longitudinal design of group evolution with three cohorts. Participants were invited as described by Morales-Chaine et al. (2023) to enroll vol-

untarily in a web-based application named *My health is also mental* (<https://www.misalud.unam.mx>, Morales-Chainé et al., 2022) using their email addresses during the first six months of 2021, 2022, and 2023 in order to complete an evaluation of their mental health status and receive feedback and treatment if necessary. The present study followed the three cohorts over evolution in 2021, 2022 and 2023.

### Instruments

We used the survey described by Morales-Chainé et al. (2023), which recollected new data from the sociodemographic section (including sex and age), and the five self-completed psychological tests (see Appendix A for further instrument description): the Life Events Checklist 5th edition (LEC-5; Weathers, Blake et al., 2013; Weathers et al., 2013a) to screen intimate-interpersonal violence from the Posttraumatic Checklist (PCL-5, A criterion; American Psychiatry Association [APA], 2013); the WHO Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) to determine harmful use for ten groups of alcohol and other drug use (WHO, 2010); the Major-Depressive-Episode (MDE) checklist to detect depression (APA, 2013); the Generalized Anxiety Test (GA; adapted from Goldberg et al., 2017); and the PCL-5 (a list) to assess posttraumatic stress disorder (PTSD; Weathers et al., 2013b; Blevins et al., 2015).

### Data Analysis

For the present study, the factor structure for each scale was evaluated as a replication of our previous study (Morales-Chainé et al., 2023), with the Confirmatory Factor Analysis CFA, using the maximum likelihood (ML) and the diagonally weighted least squares (DWLS) procedures (Elhai & Palmieri, 2011; Li, 2021; West et al., 2023). The overall fit of the models was evaluated using the chi-square goodness of fit test. The chi-square test provides information on the hypothesized models that perfectly fit the data. Although we have considered that every model is wrong, we are convinced that they might approximate our reality. We considered the fit indices for specified models that might be less affected by sample size (West et al., 2023). The Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) are goodness-of-fit indices in a proportion fit metric, whereas the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR) are badness-of-fit indices that are not in proportion metric. The RMSEA is based on the insight that although T asymptotical-

ly follows the central chi-square distribution under the null hypothesis (H0), it asymptotically follows a non-central chi-square distribution under the alternate hypothesis (H1). The TLI penalizes models that estimate many parameters but are unaffected by sample size. The CFI is also unaffected by sample size. Here, models with CFI and TLI values greater than .900 and RMSEA and SRMR values of less than .08 and .06 were considered indicators of data fit (Li, 2021; West et al., 2012; West et al., 2023). The SRMR index was not considered for categorical data as Li (2021) recommended. Once we determined each scale's final structure model, we calculated their Cronbach's alpha reliability.

As we did before (Morales-Chainé et al., 2022), in the present study we have analyzed the measurement invariance of each scale by sex, cohort, Victimized Intimate Violence (VIV), and Victimized Interpersonal Violence (VIPV) groups to determine the extent to which each item showed equivalent psychometric properties during the COVID-19 pandemic. A series of multiple-group CFA models fit the data, each with increasing equality constraints in the item parameters (Jöreskog, 1971; Sörbom, 1974; Vandenberg & Lance, 2000). The configural invariance was tested by allowing all parameters (loadings, thresholds, and unique factor variances) to be freely estimated by comparison groups (such as sex). Next, metric invariance was assessed by constraining the item loadings to equality across comparison groups. Strong measurement invariance was tested by constraining the item thresholds to equality across comparison groups. Finally, strict measurement invariance was tested by constraining the item's unique factor variances to equality across comparison groups. Nested models were evaluated using the chi-square test for continuous data. We also examined the CFI and TLI change from the less restricted model to the more constrained model ( $\Delta$ ). The more constrained model with changes in the CFI values of .01 or less was regarded as good (Cheung & Rensvold, 2002), and the RMSEA values of .015 or less were also considered acceptable. In cases where the invariance models did not fit the data, partial invariance was examined by allowing some of the item parameters to vary between groups. Modification indices (MI) were examined to determine which item parameters needed to be freely estimated across groups. Measurement invariances were calculated for the comparison groups in each study (such as cohorts). In the final invariance model, we constrained each group's latent variables, comparing the model's fit with and without constraints in the means. Again,



significant chi-square values, CFI values of less than .01, and RMSEA values differences of less than .015 indicated that the constrained means model was a model with restrictions with a good fit.

To test our hypothesis, we obtained the scores for each scale and classified subjects who met the violence (LEC-5), AOD (ASSIST), depression (MDE), anxiety (GA), and PTSD (PCL-5) criteria for risk (Morales-Chainé et al., 2023). We calculated groups for polydrug use (more than one harmful AOD use) and comorbidity (more than one group of mental health symptoms; Craig et al., 2023). We compared the distribution of participants for every risk (such as victimizing intimate violence) by sex, year of the pandemic, and cohorts. We performed chi-squared

tests, considering p-values under .05, on participants' distribution, by groups of risk from violence, harmful AOD use, depression, anxiety, and PTSD symptoms, and by sex, year of study, and cohorts.

Finally, we ran several tested structural models of the association directionality from victimizing and perpetrating intimate and interpersonal violence, harmful AOD use, and mental health symptoms. We analyzed the predictive models between variables, evaluating the mediating effects between violence, damage due to AOD use, and mental health symptoms through the Structural Equation Modeling (SEM) with a mixture of continuous and categorical variables (Li, 2021). We obtained models by sex, year of the pandemic, and cohorts, with their chi-squared

**Table 1**

*Participant distribution by sex, year, and cohorts (youngest young, middle young, and oldest young)*

TOTAL				2021				2022				2023			
Men		Women		Men		Women		Men		Women		Men		Women	
n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
1651	32.36	3451	67.64	956	32.72	1966	67.28	465	31.55	1009	68.45	230	32.58	476	67.42
Sub-total				Sub-total				Sub-total				Sub-total			
n		%		n		%		n		%		n		%	
5102		100		2922		57.27		1474		28.89		706		13.84	
Youngest young				2021				2022				2023			
Men		Women		Men		Women		Men		Women		Men		Women	
n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
570	30.73	1285	69.27	292	32.16	616	67.84	188	29.56	448	70.44	90	29	221	71.06
Sub-total				Sub-total				Sub-total				Sub-total			
n		%		n		%		n		%		n		%	
1855		36.36		908		48.95		636		34.29		311		16.77	
Middle young				2021				2022				2023			
Men		Women		Men		Women		Men		Women		Men		Women	
n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
653	33.18	1315	66.82	384	32.96	781	67.04	175	31.88	374	68.12	94	37.01	160	62.99
Sub-total				Sub-total				Sub-total				Sub-total			
n		%		n		%		n		%		n		%	
1968		38.57		1165		59.20		549		27.90		254		12.91	
Oldest young				2021				2022				2023			
Men		Women		Men		Women		Men		Women		Men		Women	
n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
428	33.46	851	66.54	280	32.98	569	67.02	102	35.29	187	64.71	46	32.62	95	67.38
Sub-total				Sub-total				Sub-total				Sub-total			
n		%		n		%		n		%		n		%	
1279		25.07		849		66.38		289		22.60		141		11.02	

test and fitting indices. All analyses were conducted using the Lavaan statistical package .6-11 in the integrated development environment RSTUDIO® statistical software 2022.02.0 from the R Core Team (2018) of the Foundation for Statistical Computing. We also used the Statistical Package for the Social Sciences (SPSS®) 25.0 (IBM Corp., 2017).

### Ethical Considerations

We considered the criteria for internet E-surveys, such as data protection, development, testing, contact mode, advertising the survey, compulsory/voluntary participation, completion rate, cookies used, IP check, log file analysis, registration, and atypical timestamp considerations (Eysenbach, 2004). The survey platform eliminates respondents who fail to complete the survey. Consequently, we only have complete response rates.

The protocol was approved with code FPSI/422/CEIP/157/2020 by the Institutional Review Board of Ethics Committee on Applied Research of the Psychology Faculty at the National Autonomous University of Mexico. Participants were told findings would be used for epidemiological research and that they could refuse to comply with data requests and drop out at any point in the study. Informed consent was obtained from all subjects involved in the study. Although incentives were not offered, immediate feedback was provided in the form of psycho-educational tools (such as infographics, videos, and Moodle® courses on COVID-19, self-care, relaxation techniques, problem-solving, and socioemotional management skills). Participants were provided information on obtaining remote psychological care from public health services. Data were asymmetrically encrypted, and the database was held in the official university domain, with security locks to protect the information.

## RESULTS

Appendix B shows the results replicating the LEC-5, ASSIST, MDE, GA, and PCL-5 scale factor models. The reliability range of the scales ranged from .40 for the Perpetrating Interpersonal Violence scale to .97 for the Negative Alterations in Cognitions and Mood (NACM) from the PCL-5. Cronbach's alpha determines the degree of independence between dimensions.

Appendices C, D, E, and F show the results of measurement invariance models comparing scales nine to fourteen (such as tobacco) by sex, cohort,

VIV, and VIPV, respectively. As expected, the difference in the chi-square test of model fit of the configural, metric, strong, and strict invariance models was significant in most comparisons due to the large sample sizes. We also considered the change in the CFIs and RMSEAs. As in every comparison, it should be noted that as MI indicated, we had incorporated the correlation between the pairs of items referred to by the CFAs. The change differences ( $\Delta$ ) between the measurement invariance models must be smaller than .01 for the CFIs and smaller than .015 for the RMSEAs (West et al., 2023).

To represent the results from appendices C, D, E, and F, appendix G summarizes biased and unbiased items based on the measurement invariance analysis by sex, cohort, VIV, or VIPV conditions. There was measurement invariance for the MDE, GA, and avoidance scales for all comparison groups—there was no item bias. There was measurement invariance between all comparisons for hyperarousal item E1, tobacco items 2 and 3, and sedatives and other drug items 2. There was measurement invariance by sex and cohort comparison groups for re-experiencing, NACM, and hyperarousal scales. There was measurement invariance for the sedative scale by sex comparison groups. Appendix G also shows that there was partial measurement invariance by VIV and VIPV comparison groups for re-experiencing, NACM, hyperarousal, alcohol, cannabis, cocaine, stimulants, sedatives, and other drugs. In other words, it was essential to freely estimate loadings, thresholds, and/or unique factor variances for these scales, and for VIV to inhalants. Bias related to partial measurement invariance indicated unknown conditions related to re-experiencing, NACM, hyperarousal, and AOD damage that should be considered while analyzing intimate or interpersonal violence with our young sample.

As shown in Table 1, we classified 5,102 young Mexicans, 67.64% women and 32.36% men, into three cohorts whose accomplishment sample was 49% on average to the next year of evolution. The total cohort comprised 2,922 youths participating in 2021; 1,474 in 2022; and 706 in 2023. Table 1 represents the three-cohort distribution. The youngest cohort were 908 18-year-old youths in 2021; 636 19-year-old youths in 2022, and 311 20-year-old youths in 2023. The middle-young cohort consisted of 1,165 21-year-old youths in 2021; 549 22-year-old youths in 2022, and 254 23-year-old youths in 2023. The oldest young cohort included 849 24-year-old youths in 2021; 289 25-year-old youths in 2022, and 141 26-year-old youths in 2023.

**Table 2**

*Participant distribution by violence, harmful AOD use, depression, anxiety, and PTSD criteria for the total sample, sex, and year of pandemic*

Victimizing Intimate Violence						Sedatives					
Total	Men	Women**	2021	2022	2023**	Total	Men	Women**	2021	2022	2023**
n	%	n	%	n	%	n	%	n	%	n	%
2060	40.38	192	29.80	1568	48.04	1140	39.01	565	38.33	355	50.28
280	5.49	69	4.18	211	6.11	142	4.86	82	5.56	56	7.93
Victimizing Interpersonal Violence						Hallucinogens					
Total	Men	Women**	2021	2022	2023**	Total	Men	Women	2021	2022	2023
n	%	n	%	n	%	n	%	n	%	n	%
3045	59.68	872	52.82	2173	62.97	1707	58.42	859	58.28	479	67.85
140	.03	50	3.03	90	2.61	68	2.33	47	3.19	25	3.54
Perpetrated Intimate Violence						Opioids					
Total	Men	Women**	2021	2022	2023**	Total	Men	Women	2021	2022	2023
n	%	n	%	n	%	n	%	n	%	n	%
1166	22.85	317	19.20	849	24.60	702	24.02	284	19.27	180	25.50
5	.10	3	.18	2	.06	2	.07	2	.14	1	.14
Perpetrated Interpersonal Violence						Other drugs					
Total	Men	Women	2021	2022	2023**	Total	Men	Women	2021	2022	2023
n	%	n	%	n	%	n	%	n	%	n	%
1796	35.20	560	33.92	1236	35.82	1001	34.26	488	33.11	307	43.48
100	1.96	40	2.42	60	1.74	55	1.88	32	2.17	13	1.84
Tobacco						Drug poly-use					
Total	Men**	Women	2021	2022	2023**	Total	Men**	Women	2021	2022	2023**
n	%	n	%	n	%	n	%	n	%	n	%
1370	26.85	512	31.01	858	24.86	698	23.89	434	29.44	238	33.71
1022	20.03	397	24.05	625	18.11	506	17.32	318	21.57	198	28.05
Alcohol						MDE					
Total	Men**	Women	2021	2022	2023**	Total	Men	Women**	2021	2022	2023**
n	%	n	%	n	%	n	%	n	%	n	%
1087	21.31	420	25.44	667	19.33	525	17.97	349	23.68	213	30.17
2420	47.43	630	38.16	1790	51.87	1359	46.51	661	44.84	400	56.66
Cannabis						GA					
Total	Men**	Women	2021	2022	2023**	Total	Men	Women**	2021	2022	2023**
n	%	n	%	n	%	n	%	n	%	n	%
684	13.41	290	17.57	394	11.42	321	10.99	213	14.45	150	21.25
2664	52.21	724	43.85	1940	56.22	1577	53.97	682	46.27	405	57.37
Cocaine						PTSD					
Total	Men**	Women	2021	2022	2023**	Total	Men	Women**	2021	2022	2023**
n	%	n	%	n	%	n	%	n	%	n	%
111	2.18	55	3.33	56	1.62	43	1.47	40	2.71	28	3.97
1392	27.28	344	20.84	1048	30.37	740	25.33	392	26.59	260	36.83
Amphetamine type-stimulants						Comorbidity					
Total	Men*	Women	2021	2022	2023**	Total	Men	Women**	2021	2022	2023**
n	%	n	%	n	%	n	%	n	%	n	%
49	.96	23	1.39	26	.75	15	.51	21	1.42	13	1.84
2240	43.90	591	35.80	1649	47.78	1266	43.33	606	41.11	368	52.12
Inhalants											
Total	Men	Women	2021	2022	2023**						
n	%	n	%	n	%						
23	.45	9	.55	14	.41	6	.21	8	.54	9	1.27

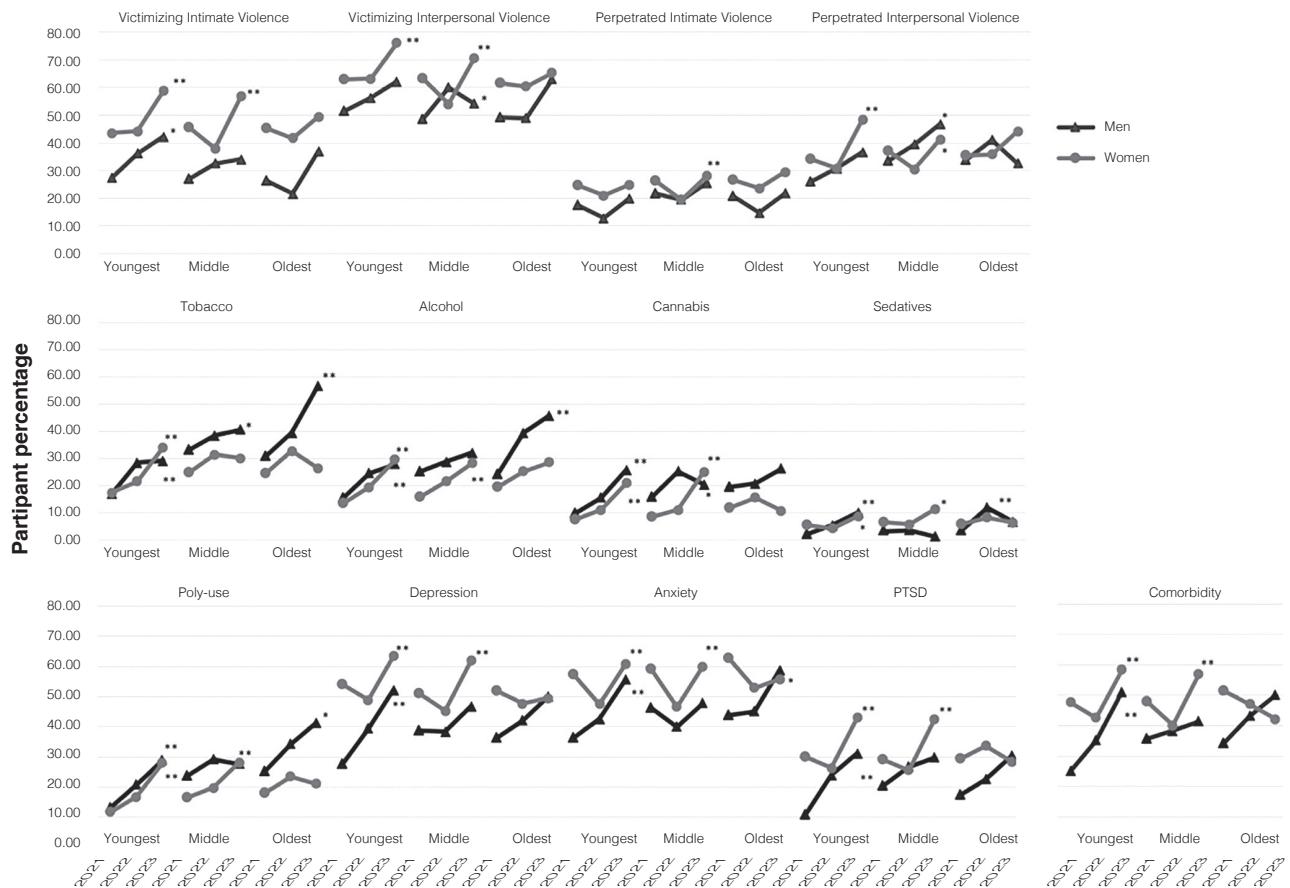
Note: \* Significant differences between groups < .05 and \*\* < .001 according to the chi-squared analysis. MDE = Major Depressive Episode, GA = Generalized Anxiety, PTSD = Posttraumatic Stress Disorder. At-risk group criteria were included in the instruments section. This means: (1) a score over one for victimizing perpetrating, interpersonal, or intimate violence; (2) a score over four for all drugs except alcohol, for which the score has to be over 11 to meet the criteria; (3) more than one harmful AOD use for polydrug use; (4) meeting criteria A and B for depression; (5) an average of over 60% for anxiety; (6) a two-response option or more for at least one of the B items, one of the C items, two of the D items, two of the E items, and bothersome symptoms for over a month for PTSD; and (7) more than one group of mental health symptoms for comorbidity.

### Violence, Harmful AOD Use, Depression, Anxiety, and PTSD for Total Sample, by Sex, Year of the Pandemic, and Cohorts

The distribution of participants at risk for violence, harmful AOD use, depression, anxiety, and PTSD symptom criteria in the total sample by sex and year of the pandemic are shown in Table 2. In the overall sample and according to the cutoff score in the corresponding scales, 40.38% of participants were at risk for victimizing intimate violence, 59.68% for victimizing interpersonal violence, 22.85% for perpetrating intimate violence, and 35.20% for perpetrating interpersonal violence; all in the three years of the pandemic. In harmful AOD use, 26.85% of participants were at risk for tobacco use, 21.31% for alcohol use, 13.41% for cannabis use, and 5.49% for sedative use. Moreover, 20.03% of the total sample was at risk for polydrug use, while 47.43% of participants were at risk for depression, 52.21% for anxiety, and 27.28% for PTSD symptoms. A total of 43.90% of the total

sample reported at least two mental health problems (comorbidity).

The percentages of men and women (together with the year of the study) who reported victimizing and perpetrating intimate and interpersonal violence, harmful AOD use, and mental health criteria are also shown in Table 2. Note that the proportions of women at risk for victimizing intimate and interpersonal violence and perpetrated intimate violence were significantly higher than those of men ( $p < .001$ ). The proportions of men at risk for tobacco, alcohol, cannabis, cocaine use, and polydrug use were significantly higher than those of women ( $p < .001$ ), except for sedative use, where more women than men reported this type of use ( $p < .001$ ). The proportions of women at risk across mental health conditions were significantly higher than those of men ( $p < .001$ ). There were significant differences between the proportions of participants at risk over the three years of the pandemic for almost all the variables except hallucinogens, opioids, and other drug scales ( $p < .001$ ).



**Figure 1.** Mental-health-AOD criteria distribution by sex and cohort conditions during the three years of the COVID-19 pandemic.



The trends would appear to have increased or fluctuated during the three years of the pandemic.

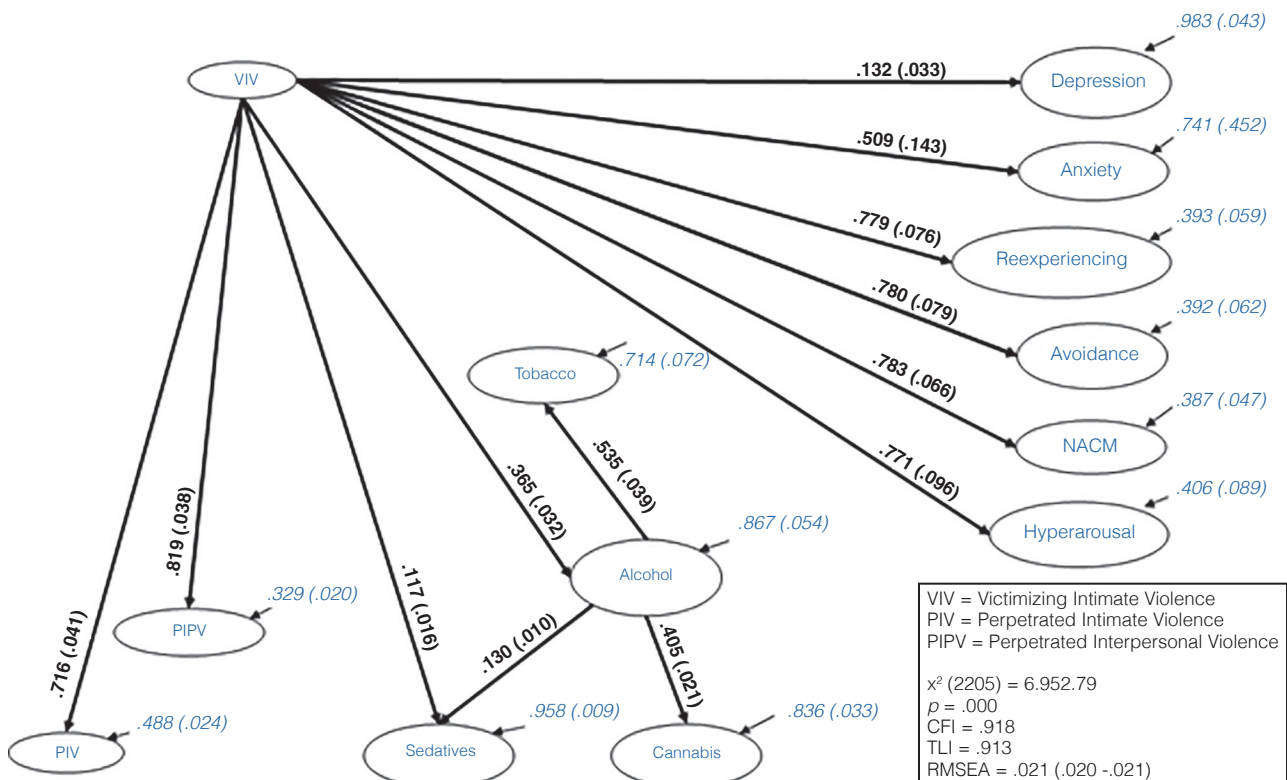
The distribution of participants at risk for violence, harmful AOD use, depression, anxiety, and PTSD symptom criteria by cohort (group-of-age-youngest, middle, and oldest young) and sex during the three years of the pandemic are shown in Figure 1. The distribution of women was increasingly higher than that of men for victimizing intimate and interpersonal violence and for depression, anxiety, PTSD, and comorbidity in the youngest and middle-young cohorts ( $p < .001$ ). The distribution of men was increasingly higher than that of women for tobacco, alcohol, and poly use in the three cohorts ( $p < .001$ ).

### Structural Equation Modeling

The overall resulting model is shown in Figure 2, including paths from victimizing intimate violence to harmful use of alcohol ( $b_{Alc} = .365$ ) and sedatives ( $b_{Sed} = .117$ ); depression, anxiety, re-experiencing, avoidance, NACM, and hyperarousal ( $b_{MDE} = .132$ ,  $b_{GA} = .509$ ,  $b_{Rex} = .779$ ,  $b_{Avo} = .780$ ,  $b_{NACM} = .783$ , and  $b_{Hyp} = .771$ , respectively); and perpetrating intimate and interpersonal violence ( $b_{PIV} = .716$ ,  $b_{PIIPV} = .819$ , respectively); all for the three years of the pandemic.

The model includes a path from harmful alcohol use to tobacco, cannabis, and sedative use ( $b_{Tob} = .535$ ,  $b_{Can} = .405$ ,  $b_{Sed} = .130$ , respectively). The model fitted with the data from 179 iterations with 269 parameters ( $X^2 [2205] = 6,952.79$ ,  $p < .001$ ). It resulted in a CFI of .918, a TLI of .913, and an RMSEA of .021 [.020-.021]), using a mixture of continuous and categorical observed variables from the total sample. Appendix A shows factor loadings for the observed variables for each scale of the SEM included in Figure 2. In all cases, factor loadings were greater than .400.

The SEMs by sex, pandemic year, and cohorts are shown in Table 3. The general pattern was replicated for men, all participants in 2022, and middle young 22-year-olds. During this period, intrafamilial violence predicted harmful alcohol use, depression, anxiety, PTSD, perpetrated intimate-interpersonal violence, and harmful use of tobacco, cannabis, and sedative-related alcohol use for men and women during the three years of the pandemic, and for 18- and 22-year-old youths. Depression due to violence experienced within the family was also evident for 24- and 25-year-old youths in 2021 and 2022. Perpetrated intimate-interpersonal violence associated with victimizing intimate violence was observed for



**Figure 2.** Variables from SEM, path coefficients, and residual variances for the whole sample.

the 19 to 21, and 25-year-old youths. Harmful sedative use related to alcohol use occurred for 19-, 20-, 22-, and 23-year-old youths.

The results suggest the dimensionality for all scales, total and partial measurement invariance by sex, cohort, VIV, and VIPV for ASSIST, MDE, GA, and PTSD. We have observed rising trends and fluctuations in victimizing intimate violence (Ha1), harmful AOD use (Ha2), and mental health symptomatology (Ha3) during the three years of the pandemic, moderated by sex and age. We also have evidence that victimizing intimate violence was related to harmful alcohol use (Ha4), depression (Ha5), anxiety (Ha6), PTSD symptoms (Ha7), and perpetrated violence (Ha8) relating to group-of-age trends over the three years of the COVID-19 pandemic.

### DISCUSSION AND CONCLUSION

The present study shows the tendency and relationship directionality between intimate violence, harmful use of AOD, and mental health symptoms among young adults during the whole COVID-19 pandemic in Mexico. As new findings, this recent research suggests the fluctuations of violence, AOD use, and mental health symptoms during the pandemic and compares these group-of-age symptoms and developmental trends across 2021, 2022, and 2023. The pandemic was characterized by increasing victimization through intimate violence, harmful use of AOD, and mental health conditions in LMICs during the pandemic (WHO, 2023). Women and men suffering intimate violence experienced harmful alcohol use, depression, anxiety, PTSD, and perpetrating

**Table 3**  
Variables from SEMs with their path coefficients (b) and standard errors (e) by sex and cohort year

Predicted Variables	Men		Women		2021		2022		2023	
	b	e	b	e	b	e	b	e	b	e
VIV										
Alcohol	.414	.072	.391	.037	.333	.041	.377	.058	.403	.092
Sedatives	.235	.026					.117	.021		
MDE	.205	.078	.092	.034	.137	.044	.166	.067	.14	.079
GA	.605	.329	.445	.144	.488	.184	.530	.223	.515	.356
Reexperiencing	.793	.145	.755	.087	.763	.098	.781	.150	.791	.207
Avoidance	.772	.154	.764	.089	.760	.098	.783	.165	.808	.225
NACM	.795	.132	.759	.073	.764	.079	.779	.138	.811	.191
Hyperarousal	.780	.168	.749	.112	.752	.121	.773	.191	.796	.256
PIV	.708	.092	.699	.044	.710	.053	.734	.082	.711	.117
PIPV	.802	.083	.809	.040	.790	.050	.829	.075	.881	.103
Alcohol										
Tobacco	.534	.065	.535	.053	.526	.042	.580	.090	.45	.116
Cannabis	.392	.037	.439	.028	.388	.021	.397	.050	.396	.081
Sedatives	.080	.014	.161	.016	.155	.013	.133	.028	.184	.027
Model										
X <sup>2</sup>	3560.74		5780.4		5401.28		3735.22		2713.98	
df	2205		2206		2205		2208		2209	
p≤	.001		.001		.001		.001		.001	
RMSEA	.019		.022		.022		.022		.018	
Confidence Interval	.018 - .020		.021 - .022		.022 - .023		.020 - .023		.016 - .020	
CFI	.923		.912		.909		.966		.929	
TLI	.918		.907		.904		.964		.925	

Note: MDE=Major Depressive Episode, GA= Generalized Anxiety, NACM= Negative Alterations in Cognitions and Mood.

**Table 3 cont...**  
*Variables from SEMs with path coefficients (b) and standard errors (e) by cohort groups (youngest, middle, and oldest young) and years (2021, 2022, and 2023)*

Predicted Variables	Youngest young						Middle young						Oldest young							
	2021		2022		2023		2021		2022		2023		2021		2022		2023			
	b	e	b	e	b	e	b	e	b	e	b	e	b	e	b	e	b	e		
Alcohol	.404	.074	.384	.100	.359	.118	.317	.058	.404	.103	.454	.162	.285	.084	.387	.158	.526	.286		
Sedatives									.139	.026										
MDE	.167	.075							.153	.101			.244	.112	.282	.154				
GA	.516	.328	.534	.626	.434	.408	.445	.25	.555	.445	.486	.51	.526	.493	.467	.684	.592	1.173		
Reexperiencing	.721	.156	.787	.388	.732	.264	.774	.14	.790	.237	.763	.315	.845	.294	.759	.314	.856	.575		
Avoidance	.703	.158	.820	.420	.758	.307	.769	.133	.774	.254	.767	.316	.86	.313	.75	.35	.885	.626		
NACM	.705	.119	.777	.326	.757	.259	.77	.113	.782	.215	.795	.281	.875	.251	.76	.314	.865	.462		
Hyperarousal	.691	.188	.768	.439	.71	.341	.758	.175	.766	.296	.799	.377	.862	.359	.775	.436	.864	.605		
PIV	.694	.083	.741	.202	.643	.190	.74	.078	.694	.129					.875	.167				
PIPV	.767	.076	.791	.194	.732	.144	.836	.073	.818	.121					.913	.146				
									Alcohol											
Tobacco	.526	.049	.583	.151	.442	.226	.577	.088	.590	.194	.424	.193	.417	.075	.453	.233	.469	.258		
Cannabis	.409	.026	.320	.065	.481	.160	.299	.029	.389	.107	.335	.155	.424	.057	.394	.143	.462	.14		
Sedatives	.188	.016	.248	.036	.168	.050			.110	.025	.221	.038								
									Model											
X <sup>2</sup>	3352.53		2633.52		2463.04		2836.61		2562.66		1912.77		2122.1		1801.59		1926.26			
df	2076		2064		2208		1771		2208		1783		2205		1713		1844			
p ≤	.001		.001		.001		.001		.001		.001		.001		.001		.001			
RMSEA	.026		.021		.019		.023		.021		.017		.022		.013		.018			
Confidence Interval	.024 - .028		.018 - .023		.014 - .024		.021 - .024		.018 - .023		.008 - .023		.020 - .024		.000 - .020		.000 - .027			
CFI	.920		.909		.911		.908		.907		.932		.912		.964		.922			
TLI	.915		.902		.905		.902		.901		.928		.906		.961		.918			

Note: MDE = Major Depressive Episode; GA = Generalized Anxiety; NACM = Negative Alterations in Cognitions and Mood; PIV = Perpetrated Intimate Violence; PIPV = Perpetrated Interpersonal Violence.

violence. They also reported harmful tobacco, cannabis, and sedative use due to alcohol consumption. These patterns varied between age cohorts. Findings in the Mexican population point to the need to design cost-effective intimate violence interventions to prevent harmful AOD use and mental health problems as a public health policy in future pandemics.

We sought to measure intimate violence, harmful AOD use, depression, anxiety, and PTSD in young Mexican adults during the COVID-19 pandemic. Our study, therefore, followed [Elhai and Palmieri \(2011\)](#) and [Scott-Storey et al. \(2023\)](#) recommendations about constantly evaluating the structure of assessments as good practice during any health emergency. In our study, intimate violence was conceptualized into the theoretical model of [WHO \(2023\)](#), [Oram et al. \(2022\)](#), [Alexander and Johnson \(2023\)](#), [Kourti et al. \(2023\)](#), [Scott-Storey et al. \(2023\)](#), [Weathers et al. \(2013a\)](#), and [Morales-Chainé et al. \(2023\)](#). Harmful AOD use, depression, anxiety and PTSD symptoms were also evaluated in accordance with the criteria of [WHO \(2010\)](#), [APA \(2013\)](#), [Goldberg et al. \(2017\)](#), [Blevins et al. \(2015\)](#), and [Morales-Chainé et al. \(2023\)](#).

The findings of our study suggest the tendencies, fluctuations, and directionality of the association between violence, damage due to AOD use, and mental health symptomatology for three young groups of age during the pandemic in Mexico. Our findings appear to suggest that the number of youths reporting intimate and interpersonal violence increased by the end of the pandemic as opposed to what was happening in high-income countries. [UNODC \(2023\)](#) and [PAHO \(2020\)](#) have already highlighted these rising trends in violence for LMIC. In 2023, one in two Mexican youths suffered violence from a relative or partner within their families, and more than two in three suffered interpersonal violence. These proportions are below what the INEGI had reported in 2021, yet substantially higher than what CONADIC reported that year and similar to what our previous cross-sectional study suggested in 2023.

Our findings suggest that in general, one in two women experienced intrafamilial violence as compared with one in three men; two in three women also suffered interpersonal violence as opposed to one in two men during the pandemic in Mexico similar to what WHO reported on 2023. Our findings thus presented a bigger picture of what happened in Mexico during the pandemic. One in two youths suffered intimate violence, while seven in ten had experienced interpersonal violence by the end of the pandemic. The study's findings also suggest that perpetrated intimate and interpersonal violence fluctuated or increased by the end of the pandemic.

One in four youths perpetrated intimate violence, and nearly one in two youths perpetrated interpersonal violence in 2023. By sex, one in four women and one in five men perpetrated intimate violence, while one in three men and women perpetrated interpersonal violence during the pandemic.

Considering harmful AOD use as an essential condition associated with violence, our findings suggested an increasing tendency of Mexican youths to report damage due to the use of alcohol, tobacco, cannabis, cocaine, stimulants, inhalants, sedatives, and hallucinogens during the pandemic. Our findings are similar to those of the [INPRFM \(2016\)](#) before the pandemic, the studies by [CONADIC \(2021\)](#) at the start of this emergency, and our previous cross-sectional study (2023) in the second year of the pandemic. The actual findings, however, refer to the fluctuations in AOD use over the three years of the pandemic by sex and comparing group-of-age patterns. More men reported harmful patterns of alcohol, tobacco, cannabis, cocaine, stimulant use, and poly-use than women. Our findings confirm that older youths reported damage due to the use of tobacco, alcohol, and poly use in 2023, whereas young women in the middle and young sectors reported damage due to using sedatives in 2022.

The complementary trends and mental health symptomatology during the pandemic for Mexican youth differed from what was happening in high-income countries, yet was similar to other LMICs prior to the pandemic ([PAHO, 2021](#)). Depression, anxiety, PTSD, and comorbidity trends grew in 2023. We also observed asymmetries by sex for mental health conditions and trends. One in two women and four in ten men reported depression, anxiety, or comorbidity during the pandemic. Three in ten women and two in ten men also reported PTSD conditions. Our trends and fluctuations were similar for all young Mexicans by cohort groups during the pandemic. Anxiety and stress were higher among our sample of Mexican youths than what CONADIC reported at the beginning of the pandemic (16% and 18%, respectively) in 2021.

Young Mexican females were more likely to experience intimate and interpersonal violence, harmful sedative use, and mental health symptoms than men during the pandemic. Another asymmetric relationship was also observed: more men reported other types of harmful AOD use. As an LMIC, Mexico also saw higher rates of violence, AOD use, and mental health symptomatology as [Layman et al. \(2022\)](#) noted in the midst of the pandemic.



Our findings also include an overall associative pattern that suggests that suffering intimate violence relates to harmful alcohol-sedative use, mental health conditions, PTSD symptoms, and perpetrating intimate interpersonal violence. In the global model, damage due to alcohol use was also associated with harmful tobacco-cannabis-sedative use by the youths in our sample. The model is consistent with previous Mexican cross-sectional findings, where intrafamilial violence was related to harmful AOD use, mental health conditions, and perpetrated violence in 2022 (Morales-Chainé et al., 2023).

These findings expand current knowledge on the interrelationship between the sex of the participants, the length of the pandemic, and youth cohorts. We observed specific patterns in Mexican youth during the COVID-19 pandemic. Intrafamilial violence was related to an increasing pattern regarding harmful alcohol use, depression, anxiety, PTSD, and perpetrated intimate-interpersonal violence, as well as harm due to tobacco, cannabis, and sedatives associated with alcohol use for both men and women during the three years of the pandemic, particularly among 18- and 22-year-olds. Depression due to intrafamilial violence was also observed among 24- and 25-year-olds. Perpetrated intimate-interpersonal violence associated with victimizing intimate violence was also observed for 19-, 20-, 21-, and 25-year-olds. Harmful sedative use linked to alcohol consumption also occurred among 19-, 20-, 22-, and 23-year-olds.

This study describes fluctuations of violence, AOD damage, and mental health symptoms, and compares trends of the relationships by sex and young-age during the COVID-19 pandemic in Mexico. According to our hypotheses, youth violence, harmful AOD use, and mental health symptomatology not only increased during the pandemic but were also interrelated and moderated by sex (Biswas, 2017; Hernández, 2018; Gubi et al., 2020). Several situations could be linked to these trends and associations as they were in several studies conducted before and during the first year of the pandemic in other countries (such as Machisa & Shamu, 2018; Craig et al., 2023; White et al., 2023). For instance, LMIC may find it more difficult to cope with stressful emergency events such as the initial lockdown, and the loss not just of relatives and friends but also of purchasing power as a result of the pandemic (Glowacz et al., 2022; Kourti et al., 2023).

The asymmetric trends in violence, harmful AOD use, and mental health symptoms by sex suggest that cultural factors in LMIC serve as social determinants (Glowacz et al., 2022; UNODC, 2022;

WHO, 2023). Scott-Storey et al. (2023) propose that violence asymmetry is the result of differences in the perception of violence from the context of social inequities and the normalized violation of human rights in certain Latin countries. They point to the contribution of the patriarchal culture, power, and control in Latin American society to violence. In Mexico, family relationships are based on violent interactions where women are subject to the power and control of men. A high number of the Mexican population uses AOD to cope with stressful situations. No less importantly, it is normalized for women to express sadness, anxiety, and PTSD symptoms, while there is a stigma for men in México. In this context, our study highlights the importance of exploring the way harmful alcohol or sedative use could be considered a means of coping with victimizing intimate violence, not only for women but also for men, and how this suffering was related to depression, anxiety and stress in young Mexicans during the COVID-19 pandemic.

The findings allow us to describe the upward trend in and associations between intimate violence, harmful AOD use, and mental health conditions in young Mexican adults during the COVID-19 pandemic. They expand existing knowledge on youth cohorts during the pandemic. Being either male or female 18- and 22-year-olds and having suffered intimate violence were conditions related to increased harmful alcohol use, depression, anxiety, PTSD, and perpetrated violence. Results included the harmful use of tobacco, cannabis, and sedatives associated with the harmful alcohol use. Findings also suggested that depression due to intrafamilial violence was present for the first two years of the pandemic among older youths. Perpetrated intimate-interpersonal violence associated with victimizing intimate violence was reported for 19- to 21-, and 25-year-old youths. Finally, harmful sedative use due to alcohol consumption was observed among 19-, 20-, 22-, and 23-year-old youths. In this context, future research could explain the role of social determinants, such as patriarchy, power, and normalized violence in Mexico, as distal and proximal determinants of the trends and relationship directionality of violence, harmful AOD use, and mental health symptomatology.

The Mexican government should design and promote brief, evidence-based interventions to ensure cost-effective procedures in future emergencies. Study findings point to the importance of designing public policies for effective recovery as well as preventive strategies to address social conditions associated with intimate violence, harmful AOD use,

and mental health conditions. Mexican public policy should consider victimizing intimate violence when designing strategies to prevent the damage due to alcohol use, severe symptoms of depression, anxiety, and PTSD, and perpetrated violence (WHO, 2022; Morales-Chainé et al., 2023; White et al., 2023). Coping strategies such as alcohol use should also be considered in order to design more effective treatment in the community and primary health care interventions.

### Limitations

This is a longitudinal cohort study based solely on youth reports of violence, harmful AOD use, and mental health symptomatology. It has limitations regarding the need for including the objective measurement of violence and its effects on substance use. Future studies should evaluate variables in later developmental stages in older Mexicans, too, while determining the policies and community interventions that should be implemented in Mexico.

Future studies could also undertake sensitivity and specificity evaluation research on the validity and measurement invariance we obtained through our scales. Some sensitivity and specificity analysis of our anxiety scale based on Goldberg et al. (2017) was undertaken. Verifying these psychometric assessment characteristics during the pandemic, however, would be helpful in solving their common limitations. This would prevent the overestimation of symptoms and reports while replicating the models obtained.

Future research could study the way normalizing intimate violence and using control and power mechanisms explain the violence, AOD use, and mental health problems in LMIC. It would also be helpful to study distal and proximal mechanisms to stop, prevent, and reduce the upward trend in intimate violence in Mexico. This could shed light on the way adopting evidence-based interventions reduces Mexicans' high drug demand while at the same time addressing intimate violence. Discovering procedures that could reduce mental health symptoms at the community level could narrow the intervention gap, which in turn would offset the lack of available specialized care services in Mexico.

### CONFLICTS OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

### FUNDING

We thank the National Autonomous University of Mexico for the support with the key DGA-PA-IV300121.

### INFORMED CONSENT STATEMENT

Informed consent was obtained from all subjects involved in the study.

### AUTHOR CONTRIBUTIONS

Silvia Morales-Chainé, Gonzalo Bacigalupe, Rebeca Robles-García and Alma Luisa López Fuentes contributed to the conceptualization, writing, data analysis, discussion, and data interpretation. All authors contributed to the article and approved the submitted version.

### REFERENCES

- Alexander, E. F., & Johnson, M. D. (2023). On categorizing intimate partner violence: A systematic review of exploratory clustering and classification studies. *Journal of Family Psychology*. Advance online publication. <https://dx.doi.org/10.1037/fam0001075>
- American Psychiatric Association [APA]. (2013). *Diagnostic and statistical manual of mental disorders DSM-5™* (5th Ed.). American Psychiatric Publishing, Inc.
- Biswas, C. S. (2017). Spousal violence against working women in India. *Journal of Family Violence*, 32(1), 55-67. <https://doi.org/10.1007/s10896-016-9889-9>
- Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress*, 28(6), 489-498. <https://doi.org/10.1002/jts.22059>
- Brabete, A. C., Greaves, L., Wolfson, L., Stinson, J., Allen, S., & Poole, N. (2020). *Substance use (SU) among women in the context of the corollary pandemics of COVID-19 and Intimate Partner Violence (IPV)*. Vancouver, BC: Centre of Excellence for Women's Health. [https://covid19mentalhealthresearch.ca/wp-content/uploads/2021/01/GREAVES\\_CMH-KS-final-report-2020-11-23.pdf](https://covid19mentalhealthresearch.ca/wp-content/uploads/2021/01/GREAVES_CMH-KS-final-report-2020-11-23.pdf)
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance. *Structural Equation Modeling*, 9(2), 233-255. [https://psycnet.apa.org/doi/10.1207/S15328007SEM0902\\_5](https://psycnet.apa.org/doi/10.1207/S15328007SEM0902_5)
- Craig, S. G., Ames, M. E., Bondi, B. C., & Pepler, D. J. (2023). Canadian adolescents' mental health and substance use during the COVID-19 pandemic: Associations with COVID-19 stressors. *Canadian Journal of Behavioural Science*, 55(1), 46-55. <https://doi.org/10.1037/cbs0000305>
- Elhai, J. D., & Palmieri, P. A. (2011). The factor structure of posttraumatic stress disorder: A literature update, critique of methodology, and agenda for future research. *Journal of Anxiety Disorders*, 25(6), 849-854. <https://doi.org/10.1016/j.janxdis.2011.04.007>

- Eysenbach, G. (2004). Improving the quality of web surveys: The checklist for reporting results of internet E-Surveys (CHERRIES). *Journal of Medical Internet Research*, 6(3), e34. <http://doi.org/10.2196/jmir.6.3e3438>
- Glowacz, F., Dziewa, A., & Schmits, E. (2022). Intimate partner violence and mental health during lockdown of the COVID-19 pandemic. *International Journal of Environment Research and Public Health*, 19(5), 2535. <https://doi.org/10.3390/ijerph19052535>
- Goldberg, D. P., Reed, G. M., Robles, R., Minhas, F., Razzaque, B., Fortes, S., Mari, J. J., Lam, T. P., Garcia, J. A., Gask, L., Dowell, A. C., Rosendal, M., Mbatia, J. K., & Saxena, S. (2017). Screening for anxiety, depression, and anxious depression in primary care: A field study for ICD-11 PHC. *Journal of Affective Disorders*, 213, 199-206. <https://doi.org/10.1016/j.jad.2017.02.025>
- Gubi, D., Nansubuga, E., & Wandera, S. O. (2020). Correlates of intimate partner violence among married women in Uganda: A cross-sectional survey. *BMC Public Health*, 20(1), 1008. <https://doi.org/10.1186/s12889-020-09123-4>
- Hernández, W. (2018). Violence with femicide risk: Its effects on women and their children. *Journal of Interpersonal Violence*, 36(11-12), 886260518815133. <https://doi.org/10.1177/0886260518815133>
- Holtzworth-Munroe, A., & Stuart, G. L. (1994). Typologies of male batterers: Three subtypes and the differences among them. *Psychological Bulletin*, 116(3), 476-497. <https://psycnet.apa.org/doi/10.1037/0033-2909.116.3.476>
- IBM Corp. (2017). *IBM SPSS Statistics for Windows*, Version 25.0. Released. IBM Corp.
- Jöreskog, K. G. (1971). Statistical analysis of sets of congeneric tests. *Psychometrika*, 36, 109-133. <https://doi.org/10.1007/BF02291393>
- Kourti, A., Stavridou, A., Panagouli, E., Psaltopoulou, T., Spiliopoulou, C., Tsoila, M., Sergentanis, T. N., & Tsitsika, A. (2023). Domestic violence during the COVID-19 pandemic: A systematic review. *Trauma, Violence & Abuse*, 24(2), 719-745. <https://doi.org/10.1177/15248380211038690>
- Layman, H. M., Thorisdottir, I. E., Halldorsdottir, T., Sigfusdottir, I. D., Allegrante, J. P., & Kristjansson, A. L. (2022). Substance use among youth during the COVID-19 pandemic: A systematic review. *Current Psychiatry Reports*, 24(6), 307-324. <https://doi.org/10.1007/s11920-022-01338-z>
- Li, C. (2021). Statistical estimation of structural equation models with a mixture of continuous and categorical observed variables. *Behavior Research Methods*, 53, 2191-2213. <https://doi.org/10.3758/s13428-021-01547-z>
- Machisa, M., & Shamu, S. (2018). Mental ill health and factors associated with men's use of intimate partner violence in Zimbabwe. *BMC Public Health*, 18(1), 376. <https://doi.org/10.1186/s12889-018-5272-5>
- Morales-Chainé, S., Bacigalupe, G., Robles-García, R., López-Montoya, A., Félix-Romero, V., & Imaz-Gispert, M. A. (2023). Interpersonal and intimate violence in Mexican youth: Drug use, depression, anxiety, and stress during the COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, 20(15), 6484. <https://doi.org/10.3390/ijerph20156484>
- Morales-Chainé, S., Robles García, R., Bosch, A., & Treviño Santa Cruz, C. L. (2022). Depressive, anxious, and Post-Traumatic Stress symptoms related to violence during the COVID-19 pandemic, by sex, COVID-19 status, and interventions-seeking conditions among the general population. *International Journal of Environmental Research and Public Health*, 19(19), 12559. <https://doi.org/10.3390/ijerph191912559>
- National Committee on Addictions [CONADIC]. (2021). *Mental Health, and Substance Abuse Observer System*. [https://www.gob.mx/cms/uploads/attachment/file/648021/INFORME\\_PAIS\\_2021.pdf](https://www.gob.mx/cms/uploads/attachment/file/648021/INFORME_PAIS_2021.pdf)
- National Institute of Psychiatry Ramón de la Fuente Muñiz [INPRFM]. (2016). *National Report of Alcohol and Tobacco (2016-2017)*. <https://www.gob.mx/salud%7Cconadic/acciones-y-programas/encuesta-nacional-de-consumo-de-drogas-alcohol-y-tabaco-encodat-2016-2017-136758>
- National Institute of Statistics and Geography [INEGI]. (2021). *Violencia contra las mujeres en México*. <https://www.inegi.org.mx/tablerosestadisticos/vcmm/>
- Oram, S., Fisher, H. L., Minnis, H., Seedat, S., Walby, S., Hegarty, K., Rouf, K., Angélieux, C., Callard, F., Chandra, P. S., Fazel, S., Garcia-Moreno, C., Henderson, M., Howarth, E., MacMillan, H. L., Murray, L. K., Othman, S., Robotham, D., Rondon, M. B., ... Howard, L.M. (2022). The Lancet Psychiatry Commission on intimate partner violence and mental health: Advancing mental health services, research, and policy. *The Lancet Psychiatry*, 9(6), 487-524. [https://doi.org/10.1016/S2215-0366\(22\)00008-6](https://doi.org/10.1016/S2215-0366(22)00008-6)
- Pan American Health Organization [PAHO]. (2020). *Burden of Non-fatal Interpersonal Violence: trends over time*. <https://www.paho.org/en/enlace/burden-other-forms-interpersonal-violence#pvtpt>
- Pan American Health Organization [PAHO]. (2021). *The burden of mental disorders in the Region of the Americas, 2000-2019*. <https://www.paho.org/en/enlace/burden-mental-disorders>
- R Core Team. (2018). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. <https://www.R-project.org>
- Scott-Storey, K., O'Donnell, S., Ford-Gilboe, M., Varcoe, C., Wathen, N., Malcolm, J., & Vincent, C. (2023). What about the men? A critical review of men's experiences of intimate partner violence. *Trauma, Violence, & Abuse*, 24(2), 858-872. <https://doi.org/10.1177/15248380211043827>
- Sörbom, D. (1974). A general method for studying differences in factor structures between groups. *British Journal of Mathematical and Statistical Psychology*, 27(2), 229-239. <https://doi.org/10.1111/j.2044-8317.1974.tb00543.x>
- United Nations Office on Drugs and Crime [UNODC]. (2022). *World Drug Report 2022*. [https://www.unodc.org/res/wdr2022/MS/World\\_Drug\\_Report\\_2022\\_Exsum\\_and\\_Policy\\_implications\\_Spanish.pdf](https://www.unodc.org/res/wdr2022/MS/World_Drug_Report_2022_Exsum_and_Policy_implications_Spanish.pdf)
- United Nations Office on Drugs and Crime [UNODC]. (2023). *UNODC Research - Data Portal - Violent and Sexual Crime*. <https://dataunodc.un.org/dp-crime-violent-offences>
- Vandenberg, R. J., & Lance, C. E. (2000). A Review and Synthesis of the Measurement Invariance Literature: Suggestions, Practices, and Recommendations for Organizational Research. *Organizational Research Method*, 3(1), 4-70. <https://doi.org/10.1177/109442810031002>
- Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., & Keane, T. M. (2013). *The Life Events Checklist for DSM-5 (LEC-5)-Standard*. [Measurement instrument]. <https://documents.net/life-events-checklist-for-dsm-5-lec-5.html?page=1>
- Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013a). *The PTSD Checklist for DSM-5 (PCL-5) – LEC-5 and extended criterion A* [Measurement instrument].

- [https://www.ptsd.va.gov/professional/assessment/documents/PCL5\\_criterionA\\_form.PDF](https://www.ptsd.va.gov/professional/assessment/documents/PCL5_criterionA_form.PDF)
- Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013b). *The PTSD Checklist for DSM-5 (PCL-5)-Standard*. [https://www.ptsd.va.gov/professional/assessment/documents/PCL5\\_Standard\\_form.PDF](https://www.ptsd.va.gov/professional/assessment/documents/PCL5_Standard_form.PDF)
- West, S. G., Taylor, A. B., & Wu, W. (2012). Model fit and model selection in structural equation modeling. In R. H. Hoyle (Ed.), *Handbook of structural equation modeling* (pp. 380-392). New York: Guilford Press.
- West, S. G., Wu, W., McNeish, D., & Savord, A. (2023). Model fit in structural equation modeling. In R. H., Hoyle (Ed.). *Handbook of Structural Equation Modeling* (2nd Ed., pp. 184-205). Guilford Press.
- White, S. J., Sin, J., Sweeny, A., Salisbury, T., Wahlich, C., Montesinos Guevara, C. M., Gillard, S., Brett, E., Alwright, L., Iqbal, N., Khan, A., Perot, C., Marks, J., & Mantovani, N. (2023). Global prevalence and mental health outcomes of intimate partner violence among women: A systematic review and meta-analysis. *Trauma, Violence, & Abuse, 25*(1), 494-511. <https://doi.org/10.1177/15248380231155529>
- World Health Organization [WHO]. (2010). *The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): Manual for use in primary care*. <https://www.who.int/publications/i/item/978924159938-2>
- World Health Organization [WHO]. (2022). *Mental health and COVID-19: Early evidence of the pandemic's impact*. [https://www.who.int/publications/i/item/WHO-2019-nCoV-Sci\\_Brief-Mental\\_health-2022.1](https://www.who.int/publications/i/item/WHO-2019-nCoV-Sci_Brief-Mental_health-2022.1)
- World Health Organization [WHO]. (2023). *Intimate partner violence*. <https://apps.who.int/violence-info/intimate-partner-violence>



#### SUPPLEMENTARY INFORMATION

The authors of this article provided supplementary material in 7 appendices A to G which are available online at:

<https://riiad.org/index.php/riiad/article/view/riiad-2024-1-02/425>

Also the attached QR will take you directly to this material.