Direct and Indirect Effects of Exposure to Violence on Post-Traumatic Stress and Substance Use among Young Mexican People

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RESUMEN

Introducción: la violencia directa e indirecta representan factores de riesgo significativos para la salud mental de los jóvenes que causan estrés postraumático y favorecen el consumo de sustancias. Gran parte de la literatura se ha enfocado a evaluar los efectos de la violencia directa, lo que deja de lado el estudio de la violencia indirecta a pesar de su impacto potencial. **Objetivo:** analizar los efectos diferenciales de la violencia directa y la violencia indirecta sobre la sintomatología del trastorno de estrés postraumático y el consumo de sustancias ilegales y legales. **Método:** se utilizó un modelo de ecuaciones estructurales para evaluar las relaciones entre las variables en una muestra por cuotas de 2,277 universitarios de 18 a 25 años provenientes de diez escuelas públicas de México. **Resultados:** la exposición a la violencia directa se asoció directamente con elevados niveles de estrés postraumático, así como con un aumento de consumo de sustancias legales e ilegales. Por su parte, la violencia indirecta mostró una relación directa con el consumo de sustancias legales e indirecta con el consumo de sustancias ilegales, mediada por la sintomatología del estrés postraumático. **Discusión y conclusiones:** estos hallazgos evidencian la relevancia de considerar ambos tipos de violencia en los modelos de evaluación y de intervención temprana con jóvenes. Se discuten las implicaciones para el diseño de políticas públicas en salud mental y la prevención del consumo de sustancias, lo que destaca la necesidad de considerar contextos estructurales de violencia que afectan de manera significativa a los jóvenes.

Palabras clave: violencia indirecta, violencia directa, trastorno de estrés postraumático, consumo de sustancias, adultos jóvenes.

ABSTRACT

Introduction: direct and indirect violence are significant risk factors for the mental health of young people, leading to posttraumatic stress disorder and increasing the likelihood of substance use. Much of the existing literature has focused on assessing the effects of direct violence, thereby overlooking the study of indirect violence despite its potential impact. **Objective:** this study aimed to analyze the differential effects of direct and indirect violence on post-traumatic stress disorder symptomatology and the use of legal and illegal substances. **Method:** the Structural Equation Modeling approach was used to examine the relationships among the variables in a quota-based sample of 2,277 university students aged 18 to 25 from ten public universities across Mexico. **Results:** the findings indicated that exposure to direct violence was directly associated with higher levels of post-traumatic stress disorder symptoms, as well as increased use of legal and illegal substances. In contrast, indirect violence revealed a direct association with legal substance use and an indirect association with illegal substance use, mediated by post-traumatic stress disorder symptomatology. **Discussion and conclusions:** these results highlight the importance of incorporating both direct and indirect violence into early assessment frameworks and psychological intervention strategies targeting youth. Implications for the design of public mental health and substance use prevention policies are discussed, emphasizing the need to consider the structural contexts of violence that significantly affect young population.

Keywords: indirect violence, direct violence, post-traumatic stress disorder, substance use, young adults.

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INTRODUCTION

Violence is a complex and multifactorial phenomenon that affects millions of people worldwide. The World Health Organization (WHO) defines it as the intentional use of physical force or power, whether threatened or actual, against oneself, another person, or a group, with a high likelihood of resulting in injury or psychological harm, or even death (Krug et al, 2002).

Over time, the concept of violence has evolved beyond its exclusive association with war or armed conflict to include less visible forms such as domestic, gender-based, and structural violence (Galtung, 2020). In this study, two primary forms of violence are distinguished: direct violence (DV) and indirect violence (IV). DV refers to explicit acts of physical, psychological, or sexual aggression, intentionally inflicted and clearly identifiable in interpersonal interactions (Bueno et al., 2024). Its analysis is grounded in psychological and contextual models that explain the individual and social determinants of aggressive behavior (Anderson & Bushman, 2002; Bandura, 1973). In contrast, IV encompasses less overt forms of aggression that stem from social structures (Galtung, 2020). These forms of violence may even be experienced vicariously, without direct physical contact.

In Latin America, youth represent one of the most vulnerable populations to violence. In Mexico, this issue has reached critical levels. Violence is one of the leading causes of death among males aged 15 to 24, and for every youth homicide, an estimated 20 to 40 young people suffer serious injuries (WHO, 2016). Young men experience higher exposure to both DV and IV, particularly in urban areas with high crime rates such as Mexico City, Guadalajara, Sinaloa, and Michoacán (Navejas-Padilla & Orozco, 2022; Nuño-Gutiérrez, 2024; Seefoó Luján, 2022).

Although lethal violence predominantly affects men, women also face high levels of victimization. According to the Encuesta Nacional sobre la Dinámica de las Relaciones en los Hogares (ENDIREH), 70.1% of women over the age of 15 have experienced at least one type of violence, most commonly psychological and sexual (Instituto Nacional de Estadística y Geografía [INEGI], 2020). At a national scale between 2015 and 2020, 43.9% of adults reported being victims of some form of violence (INEGI, 2020), contributing to a widespread perception of insecurity.

This perception is reinforced by media coverage of high-impact violent events such as the massacres in Irapuato, Guanajuato, or recent incidents in Culiacán, Sinaloa, and Hermosillo, Sonora. Intentional homicides remain one of the most alarming indicators: in 2024, the states of Morelos (67.10), Chihuahua (44.57), and Guanajuato (41.39) recorded the highest rates per 100,000 inhabitants (Secretaría de Seguridad y Protección Ciudadana [SSPC], 2025).

Another critical manifestation of violence is forced disappearances. That same year, the states with the highest numbers of missing persons were Michoacán (1,077), Tamaulipas (883), and Sinaloa (845) (Comisión Nacional de Búsqueda [CNB], 2025).

Public security perception surveys from INEGI show relative stability in states like Campeche (61.6% and 63.1%), Hidalgo (63.0% and 62%), and Michoacán (80.8% and 79.6%), while also revealing a significant decrease in states such as Chihuahua and Jalisco. However, the increase in perceived insecurity within schools is particularly concerning, rising from 29.6% in 2023 to 35.8% in 2024, according to nation-wide statistics (INEGI, 2024).

The consequences of violence are broad and significantly impact mental health. Recent studies demonstrate a strong association between exposure to violent situations and the emergence of post-traumatic stress disorder (PTSD) symptoms (INEGI, 2020; Wallinius & Nilsson, 2023). Beyond its individual impact, violence erodes the social fabric and generates environments marked by fear, mistrust, and community disintegration (Galtung, 2020).

Several studies have documented the relationship between violence, mental disorders, and substance use. Violence can serve as a risk factor that triggers or intensifies mental health problems, which in turn increase the likelihood of substance use—thus creating a cycle of psychological deterioration (Bueno et al., 2024; Medina-Mora et al., 2023). For example, a positive correlation has been found between exposure to IV and legal substance use (LSU) among adolescents aged 15 to 19 (Nuño-Gutiérrez, 2024).

PTSD can develop after experiencing traumatic events that threaten one's life or physical integrity (Boumpa et al., 2024). It is characterized by intrusive memories, distressing dreams, flashbacks, and heightened physiological reactivity to trauma-related stimuli (American Psychiatric Association [APA], 2013). In the United States of America, its prevalence among adults is estimated at 3.5%, with regional variations, while among adolescents it ranges from 19.2% to 46.6%, and can reach up to 56.9% in war contexts (Rezayat et al., 2020; Solberg et al., 2020). In Mexico, a recent study found that 25.6% of adolescents who experienced some form of sexual abuse exhibited high levels of PTSD symptoms (Nuño-Gutiérrez, 2025).

Simultaneously, an increase in the use of psychoactive substances—particularly methamphetamines—has been observed in Mexico and other countries in North America (Castillejos López, 2024).

In 2021, cannabis use among Mexican adolescents aged 15 to 16 (5.34%) surpassed that of adults (4.3%) (Ponce-Pinay et al., 2024), reflecting changing patterns of consumption and growing vulnerability among youth (Vázquez-Velázquez & Arce-Arriaga, 2024).

Although the last Encuesta Nacional de Adicciones was conducted in 2017, more recent sources confirm an increase in the use of alcohol, tobacco, and marijuana, along with a narrowing gender gap (Comisión Nacional contra las Adicciones [CONADIC], 2021; Secretaria de Salud [SS] & CONADIC, 2019).

This data reveals increasing psychosocial vulnerability among youth, particularly in contexts with high exposure to violence. Recent studies have begun to explore not only the prevalence of substance use but also its emotional implications. A study among university students in Colima showed that 86.8% perceived an increase in criminal activity, associated with increased symptoms of anxiety and nervousness (Arellano Ceballos et al., 2024). These findings underscore the need to approach substance use from a comprehensive perspective that considers structural, emotional, and contextual factors.

The Present Study

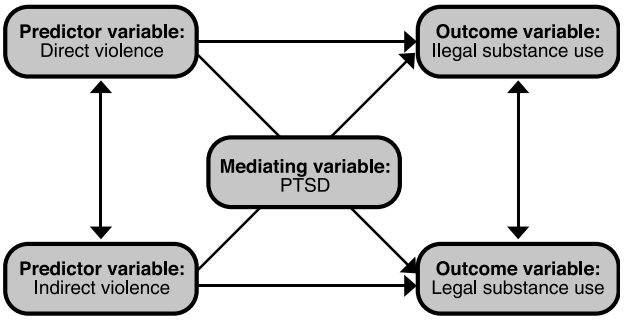
Most previous studies have primarily focused on the effects of DV (Galtung, 2020; Medina-Mora et al., 2023; Navejas-Padilla & Orozco, 2022; Orozco-Vargas et al., 2021; Rivera-Rivera et al., 2021; Seefoó Luján, 2022), leaving the potential effects of IV on mental health and substance use among youth relatively underexplored.

The objective of the present study was to analyze the direct and indirect effects of DV and IV on PTSD, LSU, and illegal substance use (ISU) levels among youth in ten cities in Mexico. Based on prior literature and the national context, a theoretical model was proposed that considered both the differential effects of types of violence and the mediating role of PTSD in the relationship between violence and substance use.

Specifically, the proposed model considered that: (i) exposure to DV would have direct and positive effects on PTSD levels, ISU, and LSU; and (ii) exposure to IV would have direct and positive effects on LSU, as well as indirect effects—mediated by PTSD—on ISU (Figure 1).

Figure 1

The Hypothetical Model.



METHOD

Design

A cross-sectional quantitative study was conducted between October 2024 and April 2025 using structural equation modeling (SEM) techniques (Byrne, 2010).

Participants

The initial sample consisted of 2,448 university students from 10 Mexican cities, recruited through non-probabilistic quota sampling at public universities. Inclusion criteria were being between 18 and 25 years old, and being enrolled in one of the participating institutions. A total of 66 participants who reported use of a fictitious substance (physol) and 105 individuals over the age of 26 were excluded.

The final sample included 2,277 participants, with a mean age of 20.6 years (SD ± 1.79); 67% were women. Greater female participation was intentionally sought, given that young men experience higher exposure to violence in the Mexican context (Navejas-Padilla & Orozco, 2022; Nuño-Gutiérrez, 2024; Seefoó, 2022).

Instruments

Things I Have Seen and Heard (Nuño-Gutiérrez, 2024).

This scale assesses exposure to IV (as a witness) over the past six months. It consists of 12 items grouped into three factors: firearm-related violence (five items, ω = .78; e.g., "I saw someone being shot"), symbolic or physical violence (four items, ω = .80; e.g., "I saw a weapon in my home"), and armed robbery with a sharp weapon (three items, ω = .81; e.g., "I saw a house or business being robbed at knifepoint"). Responses followed a five-point Likert scale (0 = never; 4 = four times). The overall internal consistency was ω = .82, with 68.4% of the total variance explained.

Direct Violence. An ad hoc scale was developed for this study, composed of 10 items assessing personal experiences of violence over the past six months, including threats, armed aggression, extortion, and violent robbery (e.g., "I had to run and hide when someone started shooting"). The response format was identical to the IV scale. Factor analyses revealed a unidimensional structure with adequate internal consistency (ω = .81) and 67.3% of variance explained.

Children's Revised Impact of Event Scale (CRIES-8).

This scale measures intrusive and avoidance reactions related to traumatic events experienced in the previous seven days (Nuño-Gutiérrez, 2025).

The Mexican adolescent version retained its original bifactor structure, with intrusion (e.g., "You think about it even when you do not want to") and avoidance (e.g., "You stay away from places or situations that remind you of what happened") factors.

Responses were recorded on a Likert scale (0 = never, 1 = rarely, 3 = sometimes, and 5 = often). Internal consistency was adequate for both subscales, with ω = .87 for intrusion, ω = .82 for avoidance, and ω = .91 overall. Total variance explained was 71.8%.

Substance Use. Substance use was assessed using 10 dichotomous items (yes/no) that evaluated the use of legal substances (tobacco, alcohol, binge drinking, and drunkenness) and illegal substances (marijuana, inhalants, cocaine, non-prescribed tranquilizers, and other drugs) in the past month (Villatoro Velázquez et al., 2017).

Procedure

Data collection was conducted in full classroom groups using an online form designed in Google Forms, administered in person in university classrooms across the ten participating cities. Access to the questionnaire was provided through a printed QR code placed in each classroom, allowing students to complete it on their mobile devices using institutional Wi-Fi. The administration was coordinated by local researchers in groups of 20 to 30 students. The average completion time was approximately 20 minutes.

Data Analysis

The psychometric properties of the scales were assessed prior to conducting structural equation modeling, as valid and reliable measures are essential to ensure the adequacy of the measurement model and, consequently, the validity of the structural model.

As Kline (2016) emphasizes, measurement precision is critical in SEM, since errors in the specification of the measurement model can significantly affect the interpretation of latent construct relationships.

To assess this, the dataset was split into two random subsamples (Lloret-Segura et al., 2014). The first subsample (n = 1,139) was used to perform exploratory factor analysis (EFA) on the three scales using JASP software (JASP, 2022). Sampling adequacy was examined using the KMO index (≥ .80) and Bartlett's test of sphericity (significant). Valid factors were defined as those retaining at least three items with loadings ≥ .40, and without cross-loadings on multiple factors. Model fit was considered acceptable with values of χ^2 < .05, RMSEA ≤ .08, CFI ≥ .95, GFI ≥ .95, AGFI ≥ .90, and TLI > .90 (Brown, 2015).

The second subsample (n = 1,138) was used to conduct confirmatory factor analysis (CFA) on the three scales using JASP (2022) to validate the identified factor structure (Lloret-Segura et al., 2014).

Model fit was considered acceptable with values of χ^2 ≥ .5, RMSEA ≤ .08, CFI ≥ .95, SRMR ≤ .08, GFI ≥ .90, and TLI > .90 (Brown, 2015). Internal consistency for each factor was assessed using McDonald's omega coefficient (Hayes & Coutss, 2020) in JASP (2022), with acceptable values ranging from .70 to .90.

To analyze the relationships between variables, a structural equation model (SEM) was implemented using JASP (2022). Given the non-normal distribution of the data, a robust estimation method was employed. SEM enables examination of causal relationships between observed and latent variables, modeling direct and indirect effects—including mediating effects—to test the fit between the theoretical model and empirical data (Byrne, 2010). This technique combines elements of factor analysis and multiple regression, facilitating the analysis of complex structures with multiple simultaneous dependencies.

The model tested direct and indirect effects between the latent variables: DV, IV, and PTSD; as well as the observed variables: ISU and LSU. Global model fit criteria were: $\chi^2/df \leq 3$; RMSEA ≤ .06 (good fit) and ≤ .08 (acceptable fit); SRMR ≤ .08; CFI ≥ .95; and TLI ≥ .95 (Brown, 2015).

Ethical Considerations

The study was conducted in accordance with the Ley General de Salud for research and was approved by the Research Ethics Committee of Universidad de Guadalajara (CINV-01-2025). All participants provided informed consent prior to accessing the questionnaire. Data confidentiality was ensured in accordance with the institutional privacy notice of the Universidad de Guadalajara (2019). Participation was entirely voluntary and anonymous, with no negative consequences for non-participation.

Table 1
Psychometric Properties of the Scales Used.

	Exploratory factor analysis								
Scale	*KMO*	*p*	*Explained variance*	*RMSEA*	*90% IC*	*SRMR*	*TLI*	*CFI*	*BIC*
Indirect violence	.90	< .001	68.4	.05	[.05 - .068]	.09	96	.99	17.760
Direct violence	.80	< .001	67.3%	.07	[.07 - .093]	.07	.81	.81	3566.43
CRIES-8	.93	< .001	80.5%	.08	[.07 - .088]	.08	.91	.92	1610.96
	Confirmatory factor analysis								
	χ2	*p*	*CFI*	*RMSEA*	*90% IC*	*SRMR*	*GFI*	*TLI*	*ω*
Indirect violence	8084.69	< .001	.91	.05	[.07 - .089]	.06	.91	.88	.81
Direct violence	5853.433	< .001	.81	.07	[.06 - .091]	.09	.89	.79	.79
CRIES-8	.93	< .001	.97	.05	[.05 - .089]	.02	.95	.96	.95
	Descriptive statistics of the scales								
	Number of items		*Number of factors*		*Mean*		*Standard deviation*		
Indirect violence	14		3[1]		.921		.681		
Indirect violence	10		1		.417		.479		
CRIES-8	8		2[1]		6.17		6.648		

Note: EC = [1] Converges on a second factor. Kaise-Meyer Olkin measure of sampling adequacy (*KMO*), Root Mean Square Error of Approximation (*RMSEA*), Standartized Root Mean Square Residual (*SRMR*), Tucker-Lewis Index (*TLI*), Comparative Fit Index (*CFI*), Bayesin Information Criterion (*BIC*), Goodness of Fit Index (*GFI*).

RESULTS

Psychometric Properties of the Instruments

Table 1 presents the fit indices for each of the scales, which were found to be adequate in both exploratory and confirmatory factor analyses, as well as in the assessment of internal consistency. Although no significant factorial invariance was observed across age groups, slight differences by sex were identified in the DV and IV scales, with internal consistency variations between .02 and .03. The CRIES-8 scale exhibited a stable factor structure across all subgroups analyzed.

Sociodemographic Data

Table 2 displays the sociodemographic characteristics of the sample. The proportion of women was approximately twice that of men. Participants' ages ranged from 18 to 25 years (M = 20.06; SD ± 1.79).

In terms of developmental stage, 42.8% were in late adolescence (ages 18–19), and 57.2% were in early adulthood (ages 20–25).

Correlations between Violence, PTSD, and Substance Use

Spearman correlation analysis identified a strong, positive, and significant association between DV and IV (r = .78). A moderate correlation was found between DV and PTSD (r = .30), and small but significant correlations were observed between DV and both LSU (r = .27) and ISU (r = .23). IV showed small correlations with PTSD, LSU, and ISU (all r = .15).

The correlation between ISU and LSU was moderate and significant (r = .31).

Table 2
Sociodemographic Characteristics of the Participants.

Characteristic	*n*	*Percentage*
Sex		
Female	1533	67.3
Male	744	32.7
Age		
18 – 19 years	975	42.8
20 – 25 years	1302	57.2
City		
Tampico	203	8.9
Nuevo León	184	8.1
Guadalajara	272	11.9
Mexicali	272	11.9
Zamora	226	9.9
Culiacán	252	11.1
Ciudad Juárez	231	10.1
Hidalgo	214	9.4
León	218	9.6
Campeche	205	9.1

Table 3

Spearman Correlation of Exposure to Direct and Indirect Violence, Post-Traumatic Stress, and Consumption of Legal and Illegal Substances.

	1	2	3	4	5
1 Indirect violence	1				
2 Direct violence	.656***	1			
3 PTSD	.203***	308***	1		
4 Consumption of legal substances	.285***	.272***	.150***	1	
5 Consumption of illegal substances	.229***	.236***	.155***	.261***	1

*Note: *** p = < .001*

Structural Equation Modeling

Figure 2 displays the SEM analyzing the effects of DV and IV on PTSD, LSU, and ISU. The model explained 52% of the variance (R^2 = .52). Model fit was assessed according to established guidelines (Brown, 2015). The chi-square statistic indicated some degree of misfit, χ^2 = 719.185, df = 33, p = .04, suggesting a significant discrepancy between the model and the observed data. However, given that the χ^2 statistic is highly sensitive to sample size, complementary fit indices were also considered. The Comparative Fit Index (CFI = .94) was slightly below the conventional threshold of .95, indicating a marginally acceptable fit. In contrast, the error indices were within satisfactory ranges: RMSEA = .03 [90% CI: .00 – .07] and SRMR = .00, both reflecting a good model fit. The Root Mean Square Residual (RMR = .05) was also deemed acceptable.

Direct, positive, and significant effects of DV were observed on PTSD (β = .26, p < .01) and on ISU (β = .28, p = .01). In contrast, IV showed no significant effects on PTSD or ISU, but demonstrated a direct, positive, and significant effect on LSU (β = .25, p < .01).

Additionally, PTSD functioned as a mediating variable in the relationship between DV and both LSU (β = .06, p = .004) and ISU (β = .06, p = .009).

DISCUSSION AND CONCLUSIONS

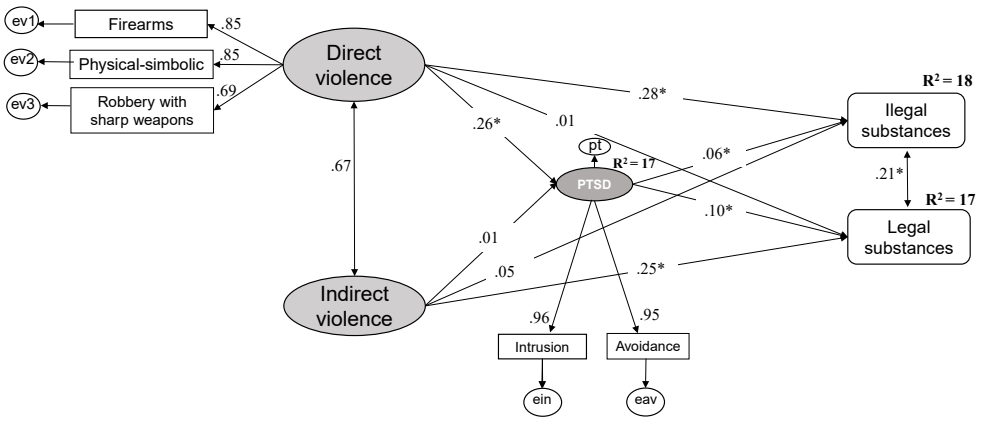
The aim of this study was to analyze the effects of DV and IV on PTSD symptoms, as well as on LSU and ISU among university students from 10 Mexican cities. The findings confirm that both DV and IV are widely present in the lives of young people, with a particularly high prevalence of IV (95.7%).

These results not only confirm the widespread presence of violence but also highlight how different types of violence can exert distinct influences on mental health and substance use. The SEM showed that DV had direct and significant effects on PTSD and ISU, while IV had a direct effect only on LSU.

PTSD functioned as a mediating variable, partially explaining the relationship between exposure to violence and substance use. It is suggested that DV may trigger acute trauma and a higher risk of psychiatric disorders, whereas IV may be more closely related to chronic stress stemming from a negative perception of the environment. However, this

Figure 2

Structural Equation Model of the Effects of Exposure to Direct and Indirect Violence on Posttraumatic Stress and the Type of Substances Consumed.



Note: Standardized values are reported. * p < .05. The elements labeled ev1, ev2, ev3, ein, and eav represent the measurement errors or residual variance of the observed variables that make up the different latent constructs in the model. These errors indicate the proportion of variance not explained by their respective latent variables and reflect the inherent imperfection present in all psychological or social measurements.

differentiation remains a hypothesis and warrants further investigation in future studies.

These findings are consistent with prior research that has identified PTSD as a mediating factor in the relationship between violence and substance use (Medina-Mora et al., 2023; Nuño-Gutiérrez, 2024).

They further strengthen the evidence that PTSD is not only an outcome of violence exposure but also a facilitator of risk behaviors such as substance use (Bueno et al., 2024; Medina-Mora et al., 2023).

Although the SEM model yielded a statistically significant chi-square value and a CFI slightly below the recommended threshold, the absolute error indices suggest an acceptable fit of the theoretical model to the empirical data. The model explained 52% of the total variance, indicating strong explanatory power.

SEM results showed that DV was directly associated with both PTSD symptoms and ISU, suggesting that direct exposure to violent events may activate dysfunctional psychological mechanisms. In contrast, IV did not show effects on PTSD or ISU, but it did affect LSU. This may reflect the use of more socially normalized coping mechanisms (e.g., alcohol and tobacco use) in response to environmental stress, without necessarily implying severe emotional dysregulation. The 48% of unexplained variance may be attributable to other individual, social, or contextual factors not included in the current model.

This finding underscores the need to continue exploring variables related to violence exposure and substance use in youth contexts.

The partial mediation of PTSD highlights the importance of this construct in understanding the effects of violence on young people's mental health and behavior. These findings contribute to the broader understanding of the ecological model of trauma, where both objective exposure and subjective perception play significant roles.

Implications for Public Policy

The findings of this study have important implications for public policy. First, they highlight the need for early detection programs for PTSD symptoms, specifically targeting students exposed to DV. Second, the results indicate that substance use prevention efforts must incorporate an understanding of the emotional impact generated by violence—particularly in contexts where insecurity and fear are part of daily life.

Moreover, it is essential to recognize that the effects of violence on youth are not only individual but also extend to family, social, and community dynamics. Therefore, interventions must be comprehensive and adapted to the cultural and regional specificities of each setting to maximize their effectiveness. In this regard, socioeconomic and cultural contexts may act as important moderators in the relationship between violence, trauma, and substance use, and should be considered in future SEM studies.

WHO (2016) has emphasized that violence is preventable and that its consequences can be mitigated. In 2016, ten international organizations, including UNICEF, PAHO, the CDC, End Violence Against Children and The World Bank, among others, collaborated to develop INSPIRE, a socioecological initiative proposing seven key strategies: enforcing and monitoring laws, modifying norms and values, improving safety in environments, supporting caregivers, strengthening economic capacities, providing response and support services, and fostering education and life skills development. However, this initiative requires interinstitutional coordination across different levels of government and institutional domains.

From this perspective, educational institutions can play a crucial role in strengthening their mental health support protocols by incorporating trauma-informed approaches that allow for the identification and support of students who have experienced violence—even if indirectly. Similarly, family and community environments may moderate the effects of violence, making it essential to promote family and social cohesion and community-based monitoring. In this sense, multidisciplinary collaboration among professionals in health, education, and justice can maximize the impact of interventions.

Understanding how young people perceive and experience DV and IV is essential for designing effective interventions within educational and community settings. The production of rigorous empirical evidence not only helps assessing the magnitude of the problem but also informs data-driven policies and practices. Aligned with this objective, the present study offers significant contributions both in terms of its scope and methodological rigor.

Strengths and Recommendations for Future Research

One of the main strengths of this study lies in the inclusion of a large and culturally diverse sample, which provides a broader understanding of the phenomenon across different urban contexts in Mexico.

Future research should consider longitudinal designs to assess how PTSD symptoms and substance use patterns evolve over time in youth exposed to violence. It would also be relevant to include non-school populations or those from rural areas, as well

as to integrate other psychosocial variables such as resilience, parental supervision, family support, and sense of community belonging, which may act as protective factors.

Additionally, future studies should further explore the effects of simultaneous or repeated exposure to DV and IV, as such experiences may have compounding effects on mental health and substance use.

Study Limitations

This study presents several limitations. The cross-sectional design, quota sampling method, and reliance on self-report measures may introduce biases related to representativeness and response accuracy.

Furthermore, important variables such as youth participation as perpetrators of violence, social support, family history, or comorbid disorders were not included in the model, and these may influence the relationships observed.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORS CONTRIBUTION

Bertha L. Nuño-Gutiérrez: methodological conceptualization and study design, software, formal analysis, research, original draft writing, supervision, and project administration.
Francisco Javier Verduzco Miramón: data acquisition, literature review, manuscript writing contribution, manuscript coordination.
J. Luis Seefoó Luján: literature review, manuscript writing, editing, critical review of intellectual content.
Jorge Luis Arriaga Martínez: data acquisition, literature review, manuscript writing contribution.
Iliana Ofelia Poblano Sánchez: data acquisition, literature review, manuscript writing contribution, abstract review and correction.
Edgar Eduardo Montes Castro: data acquisition, literature review, manuscript writing contribution.
Francisco Javier González Rivas: data acquisition, manuscript writing contribution.
Luis Flores-Padilla: data acquisition, manuscript writing contribution.
Isaac Abisaí Hernández Mijangos: data acquisition, manuscript writing contribution.

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