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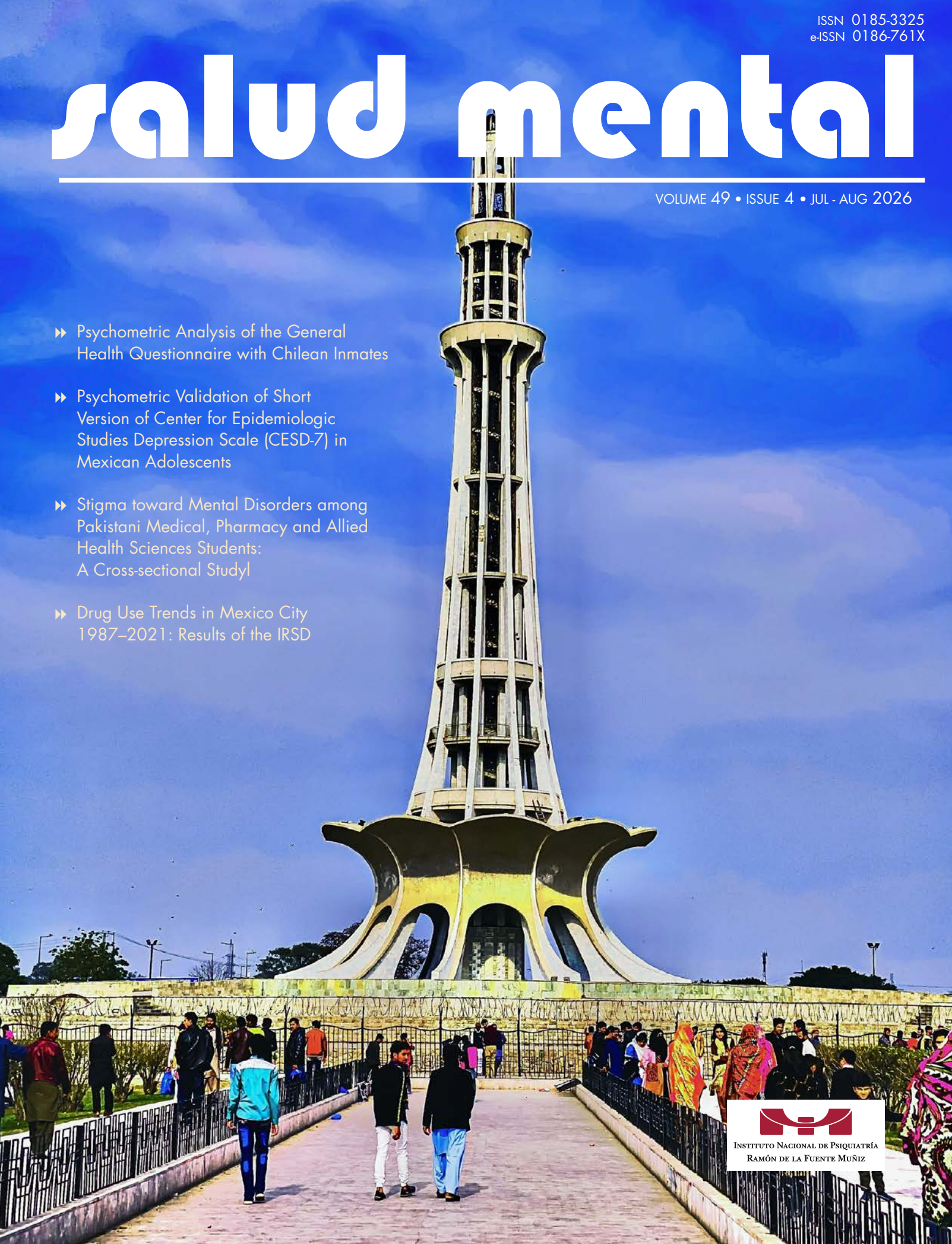

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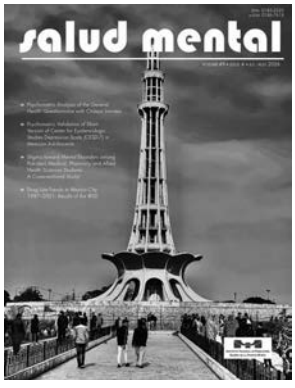

Cover illustration
Minar-e-Pakistan (Tower of Pakistan), Lahore, Punjab, Pakistan, built between 1960 and 1968
Photograph: Amjad Qureshi

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EDITORIAL
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Civilizational Threats to Childhood and Adolescence

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INTRODUCTION

The civilizational crisis

Contemporary childhood is developing within a civilizational crisis (environmental, economic, and social) which, according to Bartra (2013), stems from a production and consumption model undermining the two original sources of wealth: the earth and human beings. Within this global order, individuals are reduced to mere workers and consumers, "enslaved by advertising," stripped of the cultural institutions that once served as a "protective layer" against excessive accumulation (Bartra, 2013). This crisis translates into an "erosion of the subject," in which society's greatest wealth—its youth—is squandered by the inability of the system to provide a dignified future, pushing children toward compulsive consumption mechanisms as a means of escape or belonging (Bartra, 2013). In countries such as Mexico, this environment is further exacerbated by economic precarity, due to it 36.3% poverty rate, and high levels of criminality, increasing exposure to Adverse Childhood Experiences (ACEs). The latter are linked to more non-suicidal self-injury in adolescence (He et al., 2024) and a greater risk of substance abuse in adulthood (León Rojas et al., 2025). In this editorial, we review three civilizational threats to childhood and adolescence: addiction, identity, and violence.

Addiction problems as civilizational threats to childhood biological vulnerability: the "brake" and the "accelerator"

Developmental biology makes the young brain particularly susceptible to addiction. The brain undergoes neurological maturation characterized by a "functional disconnection" between the subcortical regions (the reward system) and the prefrontal cortex (the control center) (Aly et al., 2020). The automobile metaphor is often used: the young brain possesses a fully developed "accelerator pedal" (sensation seeking and reward pursuit), while its "brake pedal" (impulse control) remains immature (Nelson et al., 2022). Substance use and addictive behaviors produce supraphysiological levels of dopamine the immature brain cannot adequately regulate, interfering with myelination and normal development (Thomasius et al., 2022). The early onset of these behaviors, sometimes beginning as early as age 10, creates a three- to five-fold increase in the likelihood of developing a chronic disorder in adulthood (Nelson et al., 2022).

Dual perspective: substance addictions

Substance abuse remains a major risk to global pediatric health. Alcohol and cannabis use disorders are the most common, frequently beginning during puberty (Thomasius et al., 2022). Heavy cannabis use during this developmental stage severely impairs essential

cognitive functions such as memory, learning, attention, and intelligence (Aly et al., 2020). Compounding this issue is the proliferation of New Psychoactive Substances (NPS) and synthetic opioid crises involving drugs such as tramadol, which present unique challenges for clinical detection and treatment, especially among vulnerable populations such as street children. These children often use inhalants and inexpensive drugs as survival mechanisms in hostile environments (Aly et al., 2020). The normalization of substance use through mass media and social networks acts as a catalyst, further exacerbating this vulnerability (Nelson et al., 2022).

Dual perspective: behavioral and digital addictions

The boundaries of addiction have expanded into the digital sphere through Internet Gaming Disorder (IGD). The American Psychiatric Association (APA, 2026) and the World Health Organization identify it as a condition characterized by loss of control, neglect of personal hygiene, sleep disruption, and failure to meet academic responsibilities. Neuroscientific research has revealed that brain activity patterns in children with video game addiction are remarkably similar to those observed in individuals with substance use disorders (APA, 2026). It is estimated that between 2% and 3% of the global population is affected, with adolescent males representing the highest-risk group (Stevens et al., 2020). This "technological addiction" constitutes a civilizational threat because it isolates children from real-world social interaction, anchoring them to virtual environments specifically designed to maximize engagement time through reward-based algorithms (APA, 2026).

The challenge of prevention

Chemical and behavioral addictions are not isolated events but rather symptoms of a system prioritizing profit over human well-being.

Effective prevention requires a comprehensive approach that not only addresses the clinical needs of children but also mitigates socioeconomic inequalities and strengthens Benevolent Childhood Experiences (BCEs). The latter serve as protective factors that promote neurological and emotional resilience (León Rojas et al., 2025). Only through a radical transformation in the way society protects its "greatest wealth" can the trend toward a world inhabited by subjects eroded by consumerism be reversed.

Identity problems as civilizational threats to childhood

Modern technologies and their uses and implications are beginning to impact childhood and adolescent development and self-limited identification in life, a key pillar of a healthy society and civilization. For example, the XV Adecco survey shows that more boys wish to become *Youtubers* rather than doctors when they grow up, and *Streamer* and *TikToker* are showing up in the top desired professions (Redacción El Economista, 2025). Teenagers have more difficulty choosing what degree to study, with some studies reporting that as many as 39% of adolescents are classified as career uncertain (OECD, 2025). Although the causes of these changes may be multifactorial in nature, they reflect how society is changing and how the future is taking shape. The identity of new and future generations, governed by electronic devices, is changing and may be deviating from healthy development.

Identities may have benefits if they operate as a transitory structure, but they can also have a negative impact as they can prevent growth or compensate for its lack (Money, 2023). From this perspective, identities may pose a threat to human development and society if we do not understand or use them in a way that encourages the incorporation of complexities into human life. Certain terms have been popularized in mental health narratives, such as neurodiversity, rejection sensitive dysphoria, attachment styles, extremely sensitive persons, and multiple intelligences. Although these terms have varying degrees of scientific and clinical validity, the problem lies in the tendency of social media to be riddled with misinformation (Starvaggi et al., 2024), which may produce a looping effect (Chevalier, 2024) and a misinterpretation of scientific findings. This new flow of information and communication in society can spawn peculiar phenomena, such as Functional Tic-like Behaviors (Martindale & Mink, 2022), referring to the explosive onset of tic-like behaviors during the COVID-19 pandemic. Due to the accumulated evidence of the negative impacts of social media (Teague et al., 2026), organizations are beginning to recommend prohibiting social media use below the age of 16 (Plataforma Control Z, 2026) and some countries like New Zealand are even undertaking nationwide legal action (Corlett, 2025). Measures like the ones mentioned must be carefully thought through, as they may interfere with the rights of children (United Nations Commission on Human Rights, 1989), including those concerning the digital environment (Committee on the Rights of the Child, 2021).

Some identities would appear to be harmful for both the individual and society. The incel phenomenon (Aiolfi et al., 2024) has achieved a concerning status in western society because of it links to aggression and violence, facilitated by online communities and the teenage population. One could argue that another example involves national/ethnic identities. In the case of the genocide in Gaza, an estimated 22,800 violent deaths of children under 18 have occurred since 2023 (Spagat et al., 2026) largely mediated and justified by supremacist beliefs.

One of the potential identity threats to civilization is the unregulated, inappropriate use of generative artificial intelligence. Although it may help with certain tasks, it appears that its use can cause detrimental effects, such as diminishing cognitive abilities (Barcaui, 2025; Kosmyna et al., 2025) and outputs being 'homogeneously' creative (Wenger & Kenett, 2026). It can substantially hinder identity development by reducing cognitive effort and perhaps minimizing critical thinking. These topics require interdisciplinary research, detailed discussion, and regulation given their potential counter-civilizational impact on society.

Violence problems as civilizational threats to childhood

Violence has been seen as a threat to civilization for over a hundred years. Russell (1916) explained how war and violence can destroy decades of development in a matter of days. Some authors have posited that a non-violent culture is a *sine qua non* for civilization. The concept of violence could therefore be extended to poverty conditions, such as ill health, lack of food, lack of education, lack of adequate housing, inadequate living conditions and ACEs (Allinson, 2023), present worldwide but particularly so in low- and middle-income countries such as Mexico. All these forms of environmental violence in the macro system influence the environment of micro systems, in the city, the neighborhood, and the family itself.

The violence received and perpetrated by children and adolescents may be linked to several external factors such as exposure to violence in the home, school, neighborhood, video games, and other entertainment activities as well as alcohol- and drug-use and low self-esteem (Daane, 2003). Some other internal factors have also been directly associated with persistent behavioral problems, the most important of which is limited prosocial emotions (LPE). LPE is now a specifier for behavioral and oppositional defiant disorder, comprising what was previously called "callous unemotional traits" (Scheepers et al., 2011). It was proposed in 2013 as a specifier of conduct disorder (CD) by the American Psychiatry Association in the Diagnostic and Statistical Manual for Mental Disorders, Fifth Edition (APA, 2013). This was because some authors considered it part of the symptomatology of psychopathy and the most severe manifestation of antisocial behavior (Frick & Ellis, 1999). To meet the criteria for this disorder, the individual must present with two or more of the following characteristics over 12 months and in multiple relationships or settings. These include lack of remorse or guilt (LRG), callous lack of empathy (CLE), absence of concern about performance (UAP), and shallow or deficient affect (SDA). CLE and SDA have been described as core and UAP and SDA as ancillary characteristics in children and adolescents with LPE (de la Peña et al., 2022a).

Preventing violence through a practical individual approach

Give that external risk factors for violence may be difficult or in some cases impossible to change in a mental health intervention, identifying LPE early in school-age children with disruptive behavioral problems may constitute one of the most important strategies for an individual preventive intervention for reducing adolescents' misbehavior and violent behavior. In this scenario, LPE constitutes an open window for early recognition, with the potential to change negative outcomes in adolescence and adulthood (de la Peña et al, 2022b).

In short, addiction problems, identity threats, and violence are emerging as potential civilizational threats to childhood and adolescence. Mental health professionals must be aware of these situations and able to recognize them and intervene to enhance the development of children and adolescents.

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Psychometric Analysis of the General Health Questionnaire with Chilean Inmates

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ABSTRACT

Introduction. Chilean prisons face various issues that not only are detrimental to human rights but also public safety. The mental health of inmates appears to be one of the most pressing, invisible aspects of incarceration. Nevertheless, this topic remains largely invisible as there are no assessments of mental health on admission or instruments adapted to the prison context, preventing assessment and intervention. **Objective.** to analyze the psychometric properties of the 12-item Goldberg General Health Questionnaire (GHQ-12) in a sample of 1,022 inmates at 20 facilities across Chile. **Method.** we conducted a descriptive cross-sectional study and evaluated the internal structure of the GHQ-12 with both exploratory and confirmatory factor analysis. We also analyzed invariance by length of incarceration to determine the reliability of the instrument. **Results.** our results showed the multidimensionality of the instrument, with a three-factor model. Invariance was demonstrated considering length of incarceration; and a similar factor structure to other studies was obtained: anxiety, social dysfunction, and loss of confidence. **Discussion and conclusion.** Chilean prisons should have higher standards of dignity and effectiveness, including measures to improve their approach to mental health. A critical step to achieving this is ensuring timely detection of cases. The GHQ-12 appears to be a brief, simple, and inexpensive instrument that could be used as a reliable screening test to identify potential cases of mental disorders for subsequent referral and clinical treatment, as well as for prevalence studies of minor mental disorders.

Keywords: Factor analyses, statistics, prisoners, prisons, psychometrics, Chile.

RESUMEN

Introducción. Las cárceles chilenas enfrentan diversos problemas que no sólo son perjudiciales para los derechos humanos sino también para la seguridad pública. La salud mental de los encarcelados, en particular, parece ser uno de los aspectos más urgentes e invisibles del encarcelamiento. Sin embargo, este tema sigue siendo invisible ya que, por ejemplo, no existen evaluaciones de salud mental al ingreso ni instrumentos adecuadamente adaptados al contexto penitenciario, lo que impide la evaluación e intervención. **Objetivo.** Analizar las propiedades psicométricas del Cuestionario de Salud General de Goldberg de 12 ítems en una muestra de 1.022 personas encarceladas de 20 cárceles a lo largo de Chile. **Método.** Realizamos un estudio descriptivo-transversal y evaluamos la estructura interna del GHQ-12 con análisis factorial exploratorio y confirmatorio. También analizamos la invariancia por tiempo de prisión para determinar la confiabilidad del instrumento. **Resultados.** Nuestros resultados muestran la multidimensionalidad del instrumento, con un modelo de tres factores; se demostró invariancia considerando tiempo de prisión; Se demostró una estructura factorial similar a otros estudios: ansiedad, disfunción social y pérdida de confianza. **Discusión y conclusión.** Las cárceles chilenas deberían tener estándares más altos de dignidad y efectividad, incluyendo diversas medidas para mejorar su abordaje de la salud mental. Un paso crítico para esto es contar con una detección oportuna y adecuada de los casos. El GHQ-12 aparece como un instrumento breve, menos complejo y más económico que podría ser utilizado como un tamiz confiable para la identificación de casos potenciales de trastornos mentales para su posterior derivación y abordaje clínico, así como de prevalencia para estudios de trastornos mentales menores.

Palabras clave: Análisis factorial, estadístico, prisioneros, cárceles, psicometría, Chile.

INTRODUCTION

The Chilean prison system faces a series of challenges such as overcrowding and the physical deterioration of its facilities (Espinoza et al., 2014). This is compounded by the limited prospects for the effective reinsertion of incarcerated individuals, which is not only detrimental to human rights but also public safety (Sanhueza, 2023). In this regard, Chile has signed various international treaties for the proper management of incarcerated people (such as the Bangkok and Mandela Rules). In terms of mental health, all of them recognize that inmates have the right to enjoy as good health as that of the general population. They establish that it is the responsibility of the state to facilitate the detection, prevention and appropriate care of mental health issues in prisons through psychosocial support and access to prescribed psychotropic drugs. In the case of serious crises, prisoners are to be temporarily transferred to psychiatric wards or hospitals (Figueroa, 2018). Nevertheless, mental health problems in Chilean prisons remain largely invisible, since there is virtually no assessment of mental health on admission (Sanhueza et al., 2025), which prevents proper management and administration of treatments (Figueroa, 2018).

Various studies have shown that this is not a new issue. A study by Osses-Paredes and Riquelme-Pereira (2013) conducted at a major prison in southern Chile reported that 45% of the prison population interviewed had a diagnosed illness, with a predomination of mental disorders. Using a different methodology, a large study undertaken at seven prisons in Chile used the Composite International Diagnostic Interview (CIDI) to determine the prevalence of mental disorders in prisons. Substance-use disorder was the most common, with a prevalence of 12.2%, followed by anxiety and affective disorders, with prevalences of 8.3% and 8.1% respectively. These three types of disorders had a higher prevalence in the prison population than the general population. Inmates suffering from major depression also had a high risk of comorbidity with other disorders, particularly illicit drug use and anxiety disorders (Mundt et al., 2013).

A study by Baier et al. (2016) designed to conduct a symptomatic follow-up of inmates with suicide risk (linked to major depressive disorder) determined remission rates and associated variables at a prison in Chile. Findings showed that, a year after being incarcerated, 44% of inmates continued to meet the diagnostic criteria for this disorder and that comorbidity with post-traumatic stress disorder was associated with the persistence of the diagnosis. Moreover, 47% of this population presented a high risk of suicide on admission, with only 14% continuing in this situation after a year, with the risk being concentrated in the first months of admission. Another study reported that suicide accounts for 25.2% of deaths and is the second leading cause of death in this context, followed by acts of violence between inmates (Escobar et al, 2008). Ceballos-Espinoza et al. (2016) reported 132 suicides between 2006–2015 at Chilean penitentiary facilities, with depression being cited as the main trigger (43.2%).

In these studies, length of incarceration was a key factor in the mental health status of inmates. The study by Mundt et al., (2013) determined that those who had been in prison for 12 months or less had higher overall rates of mental disorders. In the case of the study by Ceballos-Espinoza et al. (2016), most suicides occurred during the first year of incarceration (65.15%), coinciding with the findings of Baier et al. (2016).

These figures highlight the importance of disorders that may be less visible, such as major depressive disorder, yet entail significant risk. Having screening tools for diagnoses in the field of mental health can be a step towards guaranteeing the right to mental health in people deprived of liberty. The General Health Questionnaire ([GHQ-12] Goldberg & Williams, 1988) is a screening instrument for detecting non-psychotic or organic mental disorders, widely used in public health (Ministry of Health, 2013). It could be used as a bridge between penitentiary services and health institutions providing a range of health services to inmates.

The psychometric equivalence of an instrument can vary depending on the cultural context and the population due to the meaning and understanding of the construct to be measured (Chahín-Pinzón, 2014). It is a key issue for variables influenced by culture such as mental health (Lewis & Araya, 1995). At the same time, since prisons house a non-representative group of the population, it should not be assumed that the instrument will behave psychometrically in the same way as it does with other populations.

The psychometric properties of the GHQ-12 have been widely studied in various countries around the world and in different populations, with most countries agreeing on the scale's acceptable reliability. However, there is no agreement on its internal structure, since the number and composition of the factors in this instrument are still under debate. In this regard, two meta-analyses of the factor structure of the GHQ-12 conclude that the instrument is essentially one-dimensional (Gnambs & Staufenbiel, 2018).

The bifactorial structure has received significant empirical support by identifying one factor associated with depression, and another with social dysfunction (Werneke et al., 2000). For example, in Argentina, Burrone and colleagues (2016) studied the psychometric properties and reliability of the GHQ-12 using a probabilistic sample of individuals attended at the primary healthcare system in Cordoba, Argentina, finding that a two-factor structure was a good solution in the studied population. Likewise, in a smaller, hospitalized-patient-based sample in Medellín, Colombia, Villa and colleagues (2013) found that a two-factor solution was a good fit. However, its structure could be seen as two parts of the same component (positive and negative) and one of the items should be removed to make

the GHQ-12 suitable for this population as it did not load properly. Others studies have determined that a three-factor structure has the best fit and utility (Campbell et al., 2003; Rivas-Diez & Sánchez-López, 2014). Still others indicate that the four-factor structure makes a better contribution to the study of minor disorders (Griffith & Jones, 2019).

Our aim was to close this knowledge gap by analyzing the psychometric properties of the GHQ-12 in people deprived of liberty at penitentiary centers in Chile. We specifically wanted to evaluate its internal structure through an exploratory and confirmatory factor analysis and subsequently analyze invariance by length of incarceration and determine the reliability of the instrument.

METHOD

Study design

This was a cross-sectional study implemented in the context of a collaborative research and development (R&D) project between [anonymized university] and the Chilean prison service *(Gendarmería de Chile)*, conducted at 20 prison facilities in each of the 16 regions in the country.

Participants

Although the study initially included 1,159 respondents, the analytical sample was ultimately reduced to 1,022 participants, housed in 20 prisons across the country. The facilities were visited between June and November 2022.

Measurements

Once consent had been obtained, each participant completed the General Health Questionnaire [GHQ-12]. If an individual had difficulty reading or writing, they were assisted by a trained interviewer.

Procedure

For this study, we used a two-stage sampling procedure. First, we purposively selected a sample of 20 prison facilities, considering the largest prison in each region as the main selection criteria. We then applied a simple, random sampling strategy to select individuals within each predetermined facility, with 95% confidence. We only considered already-sentenced individuals.

Statistical analysis

Evidence exists of different response patterns across positive and negative items, but also of improved discrimination in Likert vs. dichotomous scoring (Griffith & Jones, 2019). Items were scored using full Likert scoring but reversing positive items so that higher scores always indicated higher symptomatology. All analyses were conducted using a significance level alpha of .05. Data were processed and analyzed in R (Version 4).

To evaluate the factor structure, the sample was split in two. The first subsample (n = 511 incarcerated) was used for exploratory factor analysis (EFA), the solution to which was tested using confirmatory factor analysis (CFA) on the second subsample (n = 511 incarcerated (e.g. Ledesma et al., 2019). Subsamples were matched to include similar number of participants from public vs. private prisons, male vs. female prisons, and regions (northern, central, or southern Chile).

EFA

To check the suitability of running EFA on the collected data, we used Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. Horn's parallel analysis, with nonparametric resampling of 10.000 bootstrapped samples, was used to determine the initial number of factors (Horn, 1965; Ledesma et al., 2019). The initial solution was generated using least-squares factor extraction with Oblimin rotation due to potential correlations between factors. This initial solution was compared with those with one additional factor, to obtain a simple structure in which each item ideally loaded substantially on a single factor. The minimum factor loading was considered as .3 (Bruna et al., 2017; Fasce et al., 2011). Items with factor loadings of less than .3 on all factors were considered indicative of poor solutions. Moreover, determining the number of factors to retain considered VSS results and communalities, indicative of the proportion of variance in each item accounted for by the retained factors, to ensure the overall adequacy of the factor solution.

CFA

The second subsample was used to run a CFA with WLSMV estimation (suitable for ordinal data). An exhaustive assessment of the overall fit of the EFA model was conducted, including the comparative fit index (CFI), the Tucker-Lewis Index (TLI), and the root mean square error of approximation (RMSEA) as parameters for fit estimation. CFI and TLI values of .95 or higher were considered acceptable, while RMSEA values of less than .05 were considered good and those lower than .08 as acceptable (Cova et al., 2019; Hu & Bentler, 1999). Finally, modification indices were examined to refine the model if necessary. Reliability indicators were calculated based on the final solution using Cronbach's alpha and McDonald's omega.

Measurement invariance (factor structure equivalence)

Metric invariance was assessed for configural, metric, and scalar models. Using the criterion defined by Chen (2007), metric and scalar non-invariance would be indicated by changes in CFI greater than -.10, together with a change in RMSEA > .015.

Ethical considerations

Preselected candidates were asked about their voluntary participation in the study. Once they had provided their informed consent, they were given the GHQ-12 to be self-administered in rooms equipped for this purpose in the prisons, with only the research team present, who helped participants in case of doubt. The study was approved by the Ethics Committee of the University of [anonymized], code #25-36/2021.

RESULTS

Table 1 gives the descriptive statistics for each item from the GHQ-12, whose values range from 0–3 with the following response options: no, never; average; more than average; much more than average. The highest mean was for item *ghq4*: "I have felt unhappy or depressed".

Exploratory factor analysis

An overall KMO value of .83 (range for individual items: .75–.89) showed good ("meritorious") sampling adequacy, and Bartlett's test of sphericity was significant (Chi-square (66) = 2209.46, $p < .001$), indicating adequacy of the correlation matrix. Together they confirmed the appropriateness of the dataset for factor analysis. Details are available in Table 2.

Depending on the criteria, EFA yielded adequate models when two or three factors were retained. Horn's parallel analysis with 1000 iterations, using a 95th centile estimate, suggested retaining two components or three factors. The Very Simple Structure (VSS) analysis yielded a Velicer MAP minimum of .033 with two factors, with the Velicer MAP value for three factors at .036.

Given the equivocal results regarding the VSS and parallel analyses, we conducted analyses on both 2- and 3- factor solutions, using a polychoric correlation matrix, weighted least squares, and Oblimin rotation. The two-factor solution explained 55% of the variance. There were no items showing cross-loading above .3, and the correlation coefficient for the two factors was .22. Although the 3-factor solution explained 63% of the variance, the solution included some cross-loadings [ghq3]. Factor correlation coefficients were .12 (factors 1 / 2), .41 (factors 1 / 3), and .30 (factors 2 / 3). The item loadings for both solutions, the proportion of variance explained, and model evaluation criteria are shown in Table 3.

Confirmatory factor analysis

The following models were compared: a 1-dimensional model, which assumes that all scale variance can be explained by a single factor. We then tested the fit for two- and three-factor models using CFA. As can be seen in Table 4, CFI and TLI values, as well as the RMSEA, suggested that

Table 1
Descriptive statistics for ghq items for full sample (n = 1022). (positive items are reversed so that higher scores always indicate higher symptomatology)

	Mean	*SD*	*Median*	*Min*	*Max*	*Range*	*Skew*	*Kurtosis*	*SE*
ghq1	1.45	1.08	1	0	3	3	.17	-1.26	.03
ghq2	1.36	1.03	1	0	3	3	.29	-1.05	.03
ghq3	.95	1.03	1	0	3	3	.78	-0.62	.03
ghq4	1.62	.99	1	0	3	3	.16	1.15	.03
ghq5	.59	.96	0	0	3	3	1.47	.87	.03
ghq6	.43	.89	0	0	3	3	1.96	2.51	.03
ghq7	1.21	1.03	1	0	3	3	.10	-1.34	.03
ghq8	1.27	1.15	1	0	3	3	.19	-1.44	.04
ghq9	.96	.98	1	0	3	3	.40	-1.24	.03
ghq10	1.30	1.08	1	0	3	3	.09	-1.35	.03
ghq11	1.15	1.00	1	0	3	3	.14	-1.33	.03
ghq12	1.31	1.03	2	0	3	3	-.06	-1.30	.03

Source: Compiled by the authors.

Table 2
EFA Descriptors (positive items are reversed so that higher scores always indicate higher symptomatology)

Item	*tiempo_dic = 1 (< 2y) mean*	*tiempo_dic = 1 (< 2y) SD*	*tiempo_dic = 2 (> 2y) mean*	*tiempo_dic = 2 (> 2y) SD*	*t-test (Welch)*
ghq1	1.54	1.11	1.43	1.05	$t(314.65) = 1.08$, $p = .28$
ghq2	1.45	1.05	1.38	1.04	$t(328.28) = .68$, $p = .50$
ghq3	1.16	1.14	.89	1.01	$t(296.78) = 2.65$, $p < .01$
ghq4	1.72	1.04	1.59	.95	$t(305.53) = 1.32$, $p = .19$
ghq5	.67	1.00	.57	.96	$t(318.53) = 1.09$, $p = .28$
ghq6	.52	.98	.40	.86	$t(296.21) = 1.40$, $p = .16$
ghq7	1.38	1.09	1.13	1.04	$t(318.20) = 2.46$, $p = .01$
ghq8	1.50	1.15	1.08	1.15	$t(331.76) = 3.83$, $p < .001$
ghq9	1.10	1.02	.87	.93	$t(304.78) = 2.51$, $p = .01$
ghq10	1.43	1.16	1.16	1.05	$t(304.40) = 2.51$, $p = .01$
ghq11	1.32	1.02	1.01	.99	$t(324.75) = 3.29$, $p < .01$
ghq12	1.40	1.03	1.22	1.04	$t(336.17) = 1.79$, $p = .07$

Source: Compiled by the authors.

Table 3
EFA factor loadings for initial 2- and 3-factor solutions

	2-factor		*3-factor*		
Item	*1*	*2*	*1*	*2*	*3*
ghq1: My worries have made me lose sleep.	-.08	.74	.75	.02	.05
ghq2: I have felt constantly overwhelmed or under great stress.	-.03	.83	.84	.07	.08
ghq3: I have had the feeling that I cannot overcome my difficulties.	.13	.67	.41	.10	.38
ghq4: I have felt unhappy or depressed.	-.16	.80	.72	-.09	.16
ghq5: I have lost confidence in myself.	.19	.63	.18	.05	.68
ghq6: I have thought that I am good for nothing.	.22	.66	.06	.00	.97
ghq7: I have been able to concentrate well on what I do. (-)	.63	-.07	-.16	.58	.11
ghq8: I have felt that I play a useful/important role in life. (-)	.66	-.03	-.21	.58	.24
ghq9: I have felt capable of making decisions. (-)	.82	-.09	-.23	.75	.18
ghq10: I have been able to enjoy my daily activities. (-)	.68	.12	.20	.76	-.11
ghq11: I have been able to cope adequately with my problems. (-)	.81	.03	-.02	.80	.06
ghq12: All things considered, I feel reasonably happy. (-)	.70	.11	.22	.80	-.16
% var	27%	27%	20%	27%	16%
% cumul var	27%	55%	20%	46%	63%
Model evaluation	Chi square = 659.12 Tucker-Lewis = .716 RMSEA [CI] = .167 [.16, .18] BIC = 390.96		Chi-square = 172.85 Tucker-Lewis = .916 RMSEA [CI] = .091 [.08, .11] BIC = -32.95		

Source: Compiled by the authors.

both models were inadequate, with the three-factor solution providing a marginally better fit. We therefore used the modification indices of the 3-factor model to attempt to improve the model, by allowing item 3 to split across factors 1 and 3, yielding an acceptable solution.

We then tested a recent model from the literature using ESEM on a large sample (Griffith & Jones, 2019) to see how our solutions compared. This model showed improved goodness-of-fit indices. However, it provided a complex and therefore impractical solution with many items loading on more than one factor. Accordingly, we determined that the modified three-factor solution was the best solution.

The reliability of the modified 3-factor solution showed acceptable alphas and omegas for all subscales (f1: $\alpha = .82$, $\omega = .82$; f2: $\alpha = .81$, $\omega = .81$; f3: $\alpha = .73$, $\omega = .74$).

Measurement invariance

Results for measurement invariance for the modified three-factor model are given in Table 5. The baseline model showed an acceptable fit, with RMSEA = .074 and CFI = .964, thereby corroborating configural invariance. Although the absolute metric and scalar invariance were rejected using scaled difference chi-square tests, both were supported using the relative indices of differences in CFI (-.004 and .002, respectively) and RMSEA (.000 and -.003, respectively).

DISCUSSION AND CONCLUSION

Our main goal was to analyze the psychometric properties of the 12-item version of the Goldberg General Health Questionnaire (GHQ-12) in Chilean prisoners. The GHQ-12 showed a better solution by retaining three factors, with good internal consistency with Alpha and Omega greater than .7 for each of these, in the Chilean prison population. The three factors explained 63% of the variance. However, this solution includes a cross-loading in factors 1 (anxiety) and 3 (loss of confidence) of item ghq3: "I have had the feeling that I have not been able to overcome difficulties."

The results are in line with several authors reporting the multidimensionality of the instrument. The factors themselves are similar in structure to those reported in other studies (Graetz, 1991; Rivas-Diez & Sanchés-López, 2014). Factor 1 contains six positive items and includes elements of anxiety and depression. Factor 2, with four negative items, includes aspects of anhedonia and social dysfunction, while Factor 3, with just two items, is related to loss of confidence or self-esteem. We can therefore summarize the three factors as anxiety, social dysfunction, and loss of confidence.

Authors have attributed the diversity of factors obtained to methodological decisions such as the criteria for factor retention (Daradkeh, et. al. 2001; López-Castedo & Domínguez, 2010), and the inadequate treatment of variables measured

Table 4
Model fit indices for 2- and 3- factor CFA solutions

CFA Sample inmates						
Sample	*n = 511*					
Model	*Chi-sq (scaled)*	*df*	*P*	*CFI scaled*	*TLI scaled*	*RMSEA [90%CI] scaled*
1-factor	13765,761	54	< .001	.669	.569	.219 [.209, .229]
2-factor	272.874	53	< .001	.942	.928	.090 [.080, .101]
3-factor	217.165	52	< .001	.957	.945	.079 [.068, .090]
3-factor modified	166.537	50	< .001	.969	.960	.068 [.056, .079]
4-factor ESEM	*57.557*	*38*	*< .05*	*.995*	*.991*	*.032 [.012, .048]*

Source: Compiled by the author.

Table 5
GHQ-12 invariance fit indices by length of incarceration

CFA Sample, 3-factor modified model									
Sample	*n = 511*								
Model	*Chi-sq*	*Diff Chi-sq*	*df*	*p*	*TLI scaled*	*CFI scaled*	*Diff CFI*	*RMSEA [90%CI] scaled*	*Diff RMSEA*
Configural	240.23		100	< .001	.953	.964	n/a	.074 [.062, .086]	
Metric	264.93	24.69	110	< .001	.953	.961	-.004	.074 [.063, .086]	.000
Scalar	279.23	14.307	131	< .001	.962	.962	.002	.067 [.056, .078]	-.003

Source: Compiled by the author.
Note: χ^2 Scaled Chi-Square test statistic, $\Delta\chi^2$ Scaled difference Chi-Square test statistic.
TLI Tucker Lewis index.
CFI Comparative fix index, ΔCFI difference in CFI between models.
RMSEA root mean square error of approximation, ΔRMSEA Difference in RMSEA between models.

with interval scales (Rivas-Diez & Sanchés-López, 2014). This study used the Likert score, inverting the positive items, so that higher scores always indicate greater symptoms. It has also been attributed to the particular characteristics of the sample, as in the case of this study, corresponding to inmates.

The invariance demonstrated by the scale considering the length of incarceration factor, more or less than two years, provides evidence of the relevance of using the GHQ-12 considering this factor, since prevalence studies have shown a greater presence of mental disorders, particularly during the first months of incarceration (Mundt et al., 2013; Baier et al. 2016).

We argue that Chilean prisons should have higher standards of dignity and effectiveness, including various measures to improve their approach to mental health. A critical step here is the timely detection of cases. This requires suitable instruments that will allow screening processes, given the high prevalence of mental health disorders found in various studies on the prison population in Chile (Osses-Paredes & Riquelme-Pereira, 2013; Mundt et al., 2013). In this regard, the GHQ-12 is a brief, simple and inexpensive instrument that could be used as a reliable screener for identifying potential cases of mental disorders for subsequent referral and clinical treatment, as well as for prevalence studies of minor mental disorders.

One of the strengths of this study is its suitable sample size for achieving the proposed objectives. It provides evidence of the validity of the instrument for screening a population as specific as that found in the context of incarceration, and for serving as a bridge between health services providing care to people deprived of liberty. At the same time, the instrument proved to be invariant over time, in view of the evidence showing that mental health is more severely affected during the first months in prison.

Limitations include the fact that given the high prevalence of mental health problems in prisons reported in national studies, both clinical and non-clinical populations may have been included, which could have influenced results. Nevertheless, the GHQ-12 has demonstrated psychometric invariance between these two types of populations in previous studies (Ruiz et al., 2017). This study does not provide information on test-retest reliability, which could be important in the prison population, given the alterations in mental health that occur during the first year of incarceration (Baier et al. 2016; Ceballos-Espinoza et al., 2016).

However, this instrument has proven to be consistent and reliable in annual application periods in the general population (Pevalin, 2000), with our findings indicating that the instrument is invariant regardless of the length of incarceration. Future studies could explore test-retest reliability by applying repeated measures in this population. Moreover, in Chile, it was reported that the GHQ-12 detected a higher number of false positive cases the lower the educational attainment of a population (Araya et al., 1992). Determining a cut-off score for this instrument through an appropriate diagnostic accuracy study, including the use of gold standard measures, could contribute to more accurate, contextualized care referrals. This is particularly true if the majority of this population has lower educational attainment than the national average (Ministry of Justice and Human Rights, 2024). International studies using this instrument to determine the prevalence of symptoms and psychopathological risk have used different cut-off scores. However, none of them have empirically examined the diagnostic accuracy of the instrument in this population, instead using a generic recommendation from the authors of the questionnaire (Boothby et al., 2010; Smith & Borland, 1999; McGilloway & Donnelly, 2004).

This manuscript explored an often-overlooked issue of mental health among inmates in a large sample in Chile to contribute to the literature in both the criminological and mental health fields in the region. By evaluating the psychometric properties of the GHQ-12 we sought to provide a novel, meaningful contribution to raising awareness about mental health conditions in the Chilean prison system. In addition, we used both exploratory and confirmatory factor analyses, together with invariance testing, to add methodological rigor to this important discussion.

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Conflict of interest

The authors declare they have no conflicts of interest.

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Psychometric Validation of Short Version of Center for Epidemiologic Studies Depression Scale (CESD-7) in Mexican Adolescents

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ABSTRACT

Introduction. Depression affects 5% of adolescents worldwide, requiring a prevention policy based on reliable, updated prevalence estimates. A key factor in achieving this is the measurement instruments used. **Objective:** Psychometrically validate the short version of the Center for Epidemiologic Studies Depression Scale (CESD-7) in Mexican adolescents. **Method.** We analyzed the CESD-7 scale responses of 4,152 adolescents aged 10 to 19 who completed the Continuous National Health and Nutrition Survey (ENSANUT 2022). Four psychometric properties were evaluated: distribution, discrimination, reliability, and validity. **Results.** A version of the scale with six items was obtained, with adequate reliability *(Ordinal Omega = .91)*, discrimination, fit in its factorial structure *[$X^2_{(9)}$ = 170.03, $p < .01$; CFI = .99; RMSEA = .06 (95% CI .05–.06); SRMR = .03]*; and criterion validity concerning previous diagnosis *($t_{(144.94)}$ = 9.89, $p < .001$)*, suicidal ideation ($t_{(251.79)}$ = 18.06, $p < .01$), and suicide attempts ($t_{(239.08)}$ = 15.05, $p < .01$). **Discussion and conclusion.** The short version of the Center for Epidemiologic Studies Depression Scale (CES-D) is reliable and valid for measuring depressive symptoms in Mexican adolescents.

Keywords: Adolescents, depression, validation study, CESD-7.

RESUMEN

Introducción. La depresión afecta al 5% de los adolescentes a nivel mundial, y se requiere una política de prevención basada en estimaciones de prevalencia confiables y actualizadas. Un factor clave es el uso de instrumentos de medición adecuados. **Objetivo.** Validar psicométricamente la versión corta de la Escala de Depresión del Centro de Estudios Epidemiológicos (CESD7) en adolescentes mexicanos. **Método.** Se analizaron las respuestas a la escala CESD7 de 4152 adolescentes de 10 a 19 años que completaron la Encuesta Nacional de Salud y Nutrición Continua (ENSANUT) 2022. Se evaluaron cuatro propiedades psicométricas: distribución, discriminación, fiabilidad y validez. **Resultados.** Se obtuvo una versión de la escala con seis ítems, con fiabilidad adecuada *(Omega Ordinal = .91)*, discriminación, ajuste en su estructura factorial *[$X^2_{(9)}$ = 170.03, $p < .01$; CFI = .99; RMSEA = .06 (IC 95% .05–.06); SRMR = .03]*; y validez de criterio en relación con diagnóstico previo *($t_{(144.94)}$ = 9.89, $p < .001$)*, ideación suicida *($t_{(251.79)}$ = 18.06, $p < .01$)* y intento de suicidio *($t_{(239.08)}$ = 15.05, $p < .01$)*. **Discusión y conclusión.** La versión corta de la Escala de Depresión del Centro de Estudios Epidemiológicos (CESD) es confiable y válida para medir síntomas depresivos en adolescentes mexicanos.

Palabras clave: Adolescente, depresión, estudio de validación, CESD-7.

INTRODUCTION

Depression is a significant public health issue and considered the primary risk factor for disability and suicide (World Health Organization [WHO], 2023). Experiencing depressive episodes during adolescence is linked to functional impairment in school or work performance, as well as in interactions with family and peers, which can negatively impact development. Moreover, major depressive disorder during adolescence is strongly associated with recurrent depression in adulthood, as well as other mental disorders. It is also linked to a higher risk of suicide, one of the leading causes of death in these age groups (US Preventive Services Task Force, 2022).

Worldwide, depression is estimated to affect more than 300 million people, equivalent to 5% of the population (WHO, 2023). Depression prevalence is increasing annually, particularly among adolescents. Psychosocial factors can exacerbate the intensity of depression, exponentially increasing its consequences (Corea, 2021). A review published in 2019 evaluated the association between experiencing depression in adolescence and psychosocial outcomes in adulthood. It reported that adolescent depression was associated with failing to complete secondary education, unemployment, and pregnancy/parenthood. It also observed a lower likelihood of being employed or in tertiary education and accessing post-secondary education in adulthood (Clayborne et al., 2019).

Depression is estimated to affect approximately 5% of the global population aged 15 to 19 (WHO, 2023). In Mexico, at least 3.6 million people experience a major depressive episode before the age of 18 (Secretaría de Salud Subsecretaría de Prevención y Promoción de la Salud, 2022). Although it is challenging to compare the prevalence of depression due to the range of measurement instruments used, recent years have seen an increase in this mood disorder. According to data from the National Health and Nutrition Survey (ENSANUT 2018-19), 6.1% of adolescents showed depressive symptoms. ENSANUT 2022 reported that 31.1% of adolescents showed one depressive symptom, and 7.1% showed two (Rivera-Rivera et al., 2020; Vázquez-Salas et al., 2023).

To effectively address depression and its consequences, it is crucial to implement a prevention policy based on accurate, up-to-date estimates of the population affected. Using validated measurement tools for depressive symptoms is essential for achieving this goal (WHO, 2023).

The Center for Epidemiological Studies of Depression Scale (CES-D; Radloff, 1977) is one of the most widely used scales globally. It is a self-report tool designed to measure depressive symptoms in the general population. The scale comprises questions on symptoms associated with depression, drawn from previously validated full-length instruments, with evidence supports their reliability and validity. The original scale included 20 items organized into four factors: depressed affect, positive affect, somatization, and interpersonal relations. However, revised versions with seven, ten and 35 items are also available (Sánchez-García et al., 2014).

Various studies have demonstrated the psychometric properties of the scale in the adolescent population of Mexico. Below are some examples organized by the version they used:

The 20-item CES-D version showed adequate reliability (*Cronbach's Alpha* > .82), demonstrating evidence of construct validity with a factor structure matching the original in a sample of 1,167 children and adolescents aged 9 to 14 from Mexico City (Benjet et al., 1999). This was also achieved in a sample of 57,403 middle- (10–12 years) and high- school students (13–17 years) from Mexico City (González-Forteza et al., 2011). The 20-item version demonstrated adequate internal consistency reliability (*Cronbach's Alpha* > .84), albeit with a four-factor structure differing from the original one in a sample of 310 adolescents aged 11 to 14 in rural communities in central Mexico (Aguilera-Guzmán et al., 2004).

The 35-item CES-D version displayed good internal consistency (*Cronbach's Alpha* > .80), yielding a six-factor structure, and achieving significant discrimination between extreme scores. It also provided evidence of concurrent validity with the Roberts Suicidal Ideation Scale in a sample of 1,549 students from Mexico City with an average age of 14 (González-Forteza et al., 2008).

The 7-item version of the scale, widely used in Mexico, has been included in the National Health and Nutrition Survey since the 2018-19 edition (Romero-Martínez et al., 2019). However, no information is available on its psychometric properties in adolescents since it has only been validated in adult samples. Salinas-Rodríguez et al. (2013) analyzed 301 adults residing in Morelos, Mexico, who were initially interviewed for the 2012 National Health and Nutrition Survey. The authors found that the scale has high or adequate sensitivity and specificity values, with both the ICD-10 diagnostic criteria and the DSM-IV. In a separate study, Salinas-Rodríguez et al. (2014) studied the properties of the scale in a group of 229 older adults residing in the states of Morelos and Tlaxcala in Mexico. These adults were part of the 2012 National Health and Nutrition Survey sample. The authors found that the sensitivity and specificity with both the ICD-10 and DSM-IV diagnostic criteria were adequate.

This study therefore aimed to examine the psychometric properties of the 7-item version of the Center for Epidemiological Studies Depression Scale (CES-D7) in Mexican adolescents.

METHOD

Study design and study population

This cross-sectional study used data from the National Health and Nutrition Survey (ENSANUT) conducted in

2022. The survey, known as ENSANUT Continua 2022-24, is the third in a series and adopted a probabilistic, stratified sampling procedure based on clusters providing representation at both the state and national level (Romero-Martínez et al., 2022).

Sampling involved visiting 14,240 households distributed across eight regions of the country: Pacific-North, Border, Pacific-Center, Center-North, Center, Mexico City-State of Mexico, Pacific-South, and the Peninsula. A total of 20,605 individuals were interviewed, including 57.82% (11,914) adults aged 20 to 60, 20.15% (4,152) adolescents aged 10 to 19, and 22.03% (4,539) children aged 0 to 9.

For this study, we only analyzed responses from adolescents aged 10 to 19, with an average age of 14.32 years (*SD* = 2.88). A total of 48.68% (2,028) of these adolescents were male and 51.32% (2,124) female. Moreover, 3.37% (140) reported a previous diagnosis of depression (40% women, *n* = 56 and 60% men, *n* = 84), 5.63% (234) had experienced suicidal ideation (64.95% women, *n* = 152 and 35.05% men, *n* = 82), and 5.36% (223) had attempted suicide (62.33% women, *n* = 139 and 37.67% men, *n* = 84).

Measurements

The 7-item version of the Center for Epidemiological Studies Depression (CES-D7; Romero-Martínez et al., 2022) assesses the frequency of depressive symptoms in the past week. It uses a four-point Likert-type scale with the following response options: 1) rarely or never, 2) sometimes, 3) often, and 4) all or most of the time. Only four response options were kept because we followed the validated version of the Scale proposed by Salinas-Rodríguez et al. (2014), despite the fact that few response options do not allow for variability in the data. The decision was made because this version was intended for all the population groups.

The following question was used for the diagnosis of depression: "Has a doctor or another health professional ever told you that you suffer or have suffered from depression?" Response options were yes/no.

Two questions were used for the Suicidal Ideation and Attempt variables: "Have you ever thought about committing suicide?" Response options were yes/no. "Have you ever purposely injured, cut, poisoned, or harmed yourself to end your life?" Response options were yes, once; yes, two or more times; and never.

Statistical analysis

Information was obtained on four psychometric properties: distribution, discrimination, reliability, and validity (Edwards & Wirth, 2009). To understand the distribution of responses, a frequency analysis was conducted in terms of percentages, together with the Anderson-Darling Normality Test for each of the items and the Henze-Zirkler MultivariateNormality Test (Ebner & Henze, 2020).

Confirmatory Factor Analysis (CFA) was conducted using the Diagonally Weighted Least Squares (DWLS) method to understand the discrimination and factorial structure. This method, based on polychoric correlations, is considered suitable for handling ordinal data with a lack of normality (Li, 2016; West et al., 2012). A unidimensional model explaining the seven items was specified. Identification was completed by setting the loading of the first item at one, which defined the metric of the latent variable (Kenny & Milan, 2012).

To determine whether an item had sufficient discriminatory power, it was required to have a lambda value > .40 (Ventura-León, 2019). The overall fit of the model was assessed using four indices: Standardized Root Mean-Square Residual (SRMR) and Root Mean Square Error of Approximation (RMSEA) with values ≤ .08, and Comparative Fit Index (CFI) with a value ≥ .95 (Li, 2016). The factor scores of the scale were then calculated using the regression method and converted into standardized T scores with a mean of 50 and a standard deviation of 10. This was achieved using the R software with the LAVAAN package (Rosseel, 2012). The internal reliability of the items was analyzed using the ordinal Omega coefficient, which is suitable for this type of data (Kalkbrenner, 2023).

To assess criterion validity, we used the contrasting groups method (Richards et al., 2017). We compared means using the Student's t-test for independent samples, considering the factor scores between groups with and without a previous diagnosis of depression by medical personnel, as well as suicidal ideation and suicide attempts. We considered evidence of construct validity if there were significant differences with higher means for the groups with these conditions.

A test of measurement invariance by sex and another by age were conducted using the procedure proposed by Millsap and Olivera-Aguilar (2012), which evaluates four nested models, each more restrictive than the previous one. First, the configural model was tested to determine whether the factorial structure was the same across groups. Next, metric or weak invariance was tested (in which factor loadings are constrained to be equal), followed by the strong invariance model (in which both factor loadings and intercepts are constrained to be equal). Finally, the strict invariance model (in which factor loadings, intercepts, and item residual variances are constrained to be equal) was tested and model fits compared. Invariance is assumed if there is no significant difference in the chi-square test and changes in the CFI are less than .01, (Kline, 2016). Achieving strict invariance implies that observed differences result from the latent variable rather than measurement bias (DeShon, 2004).

Ethical considerations

The Research Ethics Committees of the National Institute of Public Health (INSP) approved all questionnaires, interview procedures, and consent forms with reference numbers 1807 for bioethics and 1798 for biosecurity. The interviewers obtained informed consent from the respondents before their participation. For participants under 18, permission and informed consent from parents or the responsible adult in the household were obtained.

Personal and sensitive data collected in the study were protected by removing any variables that could identify participants from the public dataset, such as locations and postal codes. Data management, the person responsible, and the procedures for participants to exercise their ARCO rights regarding handling their information were outlined in a general privacy notice on the official website of the survey.

RESULTS

Response distribution

The frequency analysis in percentage shows that all options had the highest concentration in the option "Rarely or never," except item CESD7_6, "I enjoy life," which displayed an inverted pattern. The normality tests showed that the responses were not normally distributed individually or as a group (HZ = 424.64, $p < .001$) (see Table 1).

Discrimination and factor structure

The confirmatory factor analysis results showed an adequate global fit to explain the data [$\chi^2(14) = 211.73$, $p < .01$; CFI = .99; RMSEA = .05 (95% CI .02–.06); SRMR = .03]. However, since item CESD7_6, "I enjoy life," was not correctly related to the latent variable, explaining it [$\lambda = .26$ (.02)], it was decided to eliminate it and respecify the model. The modified model had adequate global fit to explain the data [$\chi^2(9) = 170.03$, $p < .01$; CFI = .99; RMSEA = .06 (95% CI .05–.06); SRMR = .03], and the items had adequate factor loadings ($\lambda \geq .40$). The final structure is shown in Table 2 and Figure 1.

Reliability

The value of the ordinal Omega coefficient showed adequate reliability for the internal consistency of the six items (*ordinal Omega* = .91).

Criterion validity evidence by contrasted groups

Significant differences were found ($t(144.94) = 9.89$, $p < .001$) between adolescents with a previous diagnosis of depression by medical personnel ($M = 57.68$, $SD = 8.29$) and those without one ($M = 50.67$, $SD = 6.44$), with a large effect size (*Cohen's d* = .94). Significant differences ($t(251.79) = 18.06$, $p < .01$) wcents with suicidal ideation ($M = 59.47$, $SD = 7.59$) and those without ($M = 50.33$, $SD = 6.14$), with a large effect size (*Cohen's d* = 1.32). Moreover, significant

Table 1
Analysis of response distribution in percentages for the CESD-7 in mexican adolescents

English item	*Spanish item*	*Never*	*Rarely*	*Often*	*All the time*	*Anderson darling normality test*
1. Did you feel you couldn't shake off the sadness?	1.¿Sentías como si no pudieras quitarte de encima la tristeza?	80.94	13.17	3.73	2.14	963.26**
2. Was it difficult to focus on what you were doing?	2.¿Te costaba concentrarte en lo que estabas haciendo?	68.40	23.50	5.15	2.93	662.43**
3. Did you feel depressed?	3.¿Te sentiste deprimido(a)?	78.37	14.93	4.38	2.31	893.49**
4.Did everything you did seem like a huge effort?	4.¿Te parecía que todo lo que hacías era un esfuerzo?	70.47	19.48	5.99	4.04	708.63**
5. Didn't you sleep well?	5.¿No dormiste bien?	63.92	15.31	8.09	12.66	621.82**
6. Did you enjoy your life?	6.¿Disfrutaste de la vida?	9.10	5.51	11.97	73.41	818.29**
7.Did you feel sad?	8. ¿Te sentiste triste?	73.89	18.42	5.15	2.52	781.45**

Source: Compiled by the author.
Note: **$p < .001$.

Table 2
Fit indices of models analyzed in CFA

Model	χ^2	*CFI*	*RMSEA(95% CI)*	*SRMR*
Original with seven items	211.73**	.99	.05(.02–.06)	.03
Modified version with six items	170.03**	.99	.06(.05–.06)	.03

Note: **$p < .01$.

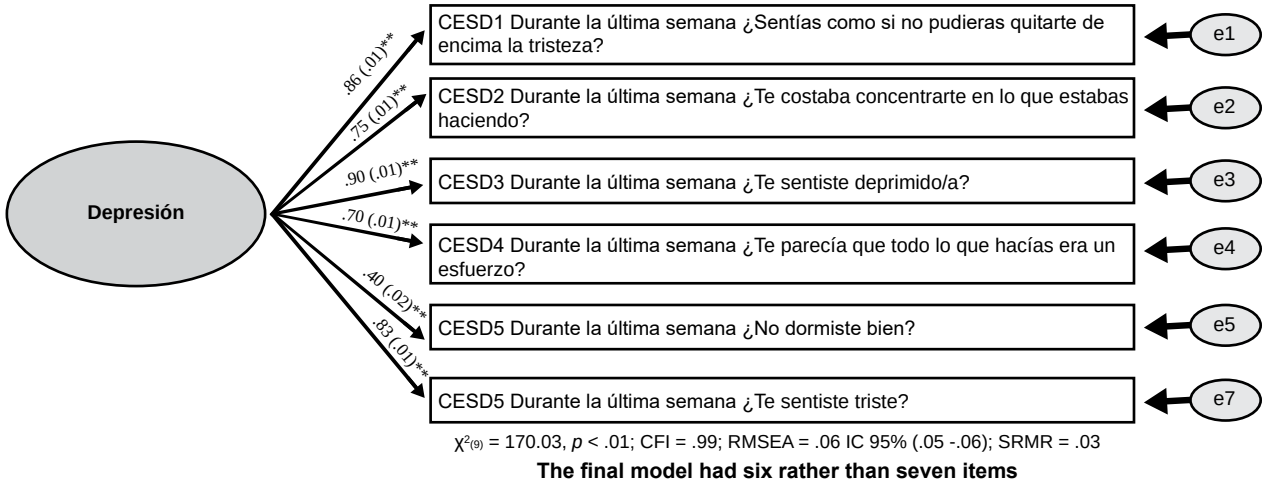

Figure 1. Factor structure of the CESD-7 scale validated in mexican adolescents.

differences ($t(239.08) = 15.05$, $p < .01$) were found between adolescents who had had one or more suicide attempts in their lifetime ($M = 58.42$, $SD = 7.72$) and those who had not ($M = 50.48$, $SD = 6.30$), with a large effect size (*Cohen's d* = 1.12) as shown in Table 3.

Measurement invariance tests by age and sex showed that the scale is suitable for comparing groups comprising these variables since we found strict invariance by sex and strong invariance by age group, as shown in Table 4.

Table 3
Criterion validity group comparisons

Variable	*Mean (standard deviation)* *Yes*	*No*	*t*	*p*	*Cohen's d*
Previous depression diagnosis	57.68 (8.29)	50.67 (6.44)	9.89	< .01**	.94
Suicidal ideation	59.47 (7.59)	50.33 (6.14)	18.06	< .01**	1.32
Suicide attempt	58.42 (7.72)	50.48 (6.30)	15.05	< .01**	1.12

Note: ** $p < .01$.

Table 4
Measurement invariance test by sex and age

Model	*Δχ²*	*p*	*ΔCFI*
Sex invariance (male vs female)			
Configural	-	-	-
Metric	2.03	.84	.01
Strong	4.89	.53	0
Strict	5.10	.42	0
Age invariance (early < 14, middle 15 - 17, late 18 - 19)			
Configural	-	-	-
Metric	2.89	.47	.01
Strong	4.92	.16	.01
Strict	6.12	.04**	.03

Note: ** $p < .01$.

DISCUSSION AND CONCLUSION

We obtained a brief version of the Center for Epidemiological Studies Depression Scale (CES-D), which is reliable and has evidence of construct validity in its adjusted structure. It also has criterion validity with previous diagnoses of depression, suicidal ideation, and suicide attempts for measuring self-reported symptoms of depression in Mexican adolescents. This is consistent with results from other versions of the scale in the same population (Aguilera-Guzmán et al., 2004; Benjet et al., 1999; González-Forteza et al., 2011; González-Forteza et al., 2008). In all previous studies, internal consistency values were similar to the one found in this study, and the factor structure was also consistent with the one found for this version of the scale, validated by Salinas-Rodríguez et al. (2014).

The confirmatory factor analysis with the original seven items showed adequate global fit. Since one did not correctly relate to the rest of the scale items, it was removed to modify the scale. Further studies in samples of Mexican adolescents are recommended, however, to ensure that the lack of relationship between this item and the others is not due to the idiosyncrasies of the sample involved (MacCallum et al., 1996). The removed item was CESD7_6 "Enjoyed life." This could be explained by the fact that anhedonia or loss of the capacity to experience pleasure does not always occur in the same way, as in some cases, pleasure may be absent in any circumstance. Conversely, in others, the problem is limited to specific aspects, such as appetite for food, sexual relations, social relationships, and leisure activities (Organización Médica Colegial de España, 2008).

This six-item version makes the scale even briefer and could facilitate its application. This is essential for the early detection of mental health disorders in adolescents as well as timely intervention to prevent severe consequences in the future (Organización Panamericana de la Salud [OPS], 2018).

Measurement invariance tests by age and sex showed that the scale is suitable for comparing groups formed by these variables, since we found strict invariance by sex and strong invariance by age group. This adheres to the recommendations of DeShon (2004) and Kline (2016).

It is important to note that although the brief version of the Center for Epidemiological Studies Depression Scale (CES-D) is reliable and valid for measuring depressive symptoms in Mexican adolescents, it has certain limitations. These include its cross-sectional design and reliance on self-reporting. Moreover, it has a significant lack of validated information on prior clinical diagnoses of depression and suicide-related behavior.

However, we consider it essential to have reliable, valid instruments within national health surveys that are suitable for different age groups. Further research is required to determine whether screening positively impacts these outcomes in adulthood. Although screening tools can effectively detect depression, this indirect evidence should not be used to suggest that they are automatically beneficial or necessary in all contexts. It is essential to consider the potential benefits and harms of screening in the specific population and context and carefully evaluate the implications of implementing a population-level screening program (Clayborne et al., 2019).

It is therefore crucial to determine whether screening will be used to provide information on population-level initiatives (such as ENSANUT in Mexico) or for clinical diagnoses. In the event of the latter, it is essential to recognize that depression screening tools cannot make diagnoses, which is a task for qualified professionals. Moreover, it is crucial to acknowledge the ongoing controversy over whether depression screening programs should be implemented. There is as yet insufficient evidence to recommend screening for depression in child populations (US Preventive Services Task Force, 2022; Clayborne et al., 2019; Roseman et al., 2017).

There is also concern that universal screening could lead to overdiagnosis, excessive medication use, and if individuals receive unnecessary treatment, a waste of already scarce resources (Flaherty, 2020). Although there is a Grade B recommendation for depression screening in adolescents aged 12 to 18, emphasis should be placed on accurate diagnosis, effective treatment, and appropriate follow-up (Patra & Kumar, 2023). From a public health perspective, it is essential to have tools that will provide reliable data to understand the health conditions and trends of the population and health service utilization and perception.

Adolescence constitutes a critical period of development. Having valid, reliable instruments for this age group can yield information on their mental health status that can subsequently be used to develop vital preventive and care interventions. The information obtained from the proposed adapted version of the CES-D can provide an overview of the mental health status of Mexican adolescents and enable better comparisons between groups of interest to guide population-level health programs.

This article is relevant because it contributes to the National Health and Nutrition Survey (ENSANUT). It validates one of the instruments in its battery in a sample of adolescents aged 10 to 19 with national representativeness, thereby enhancing the validity of the conclusions and public policy decisions based on this survey (Romero-Martínez et al., 2022).

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Conflicts of interest

The authors declare they have no conflicts of interest.

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Stigma toward Mental Disorders among Pakistani Medical, Pharmacy and Allied Health Sciences Students: A Cross-sectional Study

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ABSTRACT

Introduction. People with mental health disorders face significantly more negative judgments and stigmatization than sufferers of other illnesses, negatively affecting patients' quality of life. **Objective.** This study aimed to assess the stigma surrounding mental disorders among Pakistani medical, pharmacy, and allied health sciences students. **Method.** A cross-sectional survey was conducted among students at the University of Lahore between April and May 2022. Mental health stigma was evaluated using a modified version of the Discrimination-Devaluation (D-D) scale. **Results.** A total of 315 students were included in the study (mean age = 22.4 years, males = 51.1%). The majority of participants were pharmacy students (51.1%), followed by allied health sciences (35.2%) and medical students (13.7%). In multiple regression analysis, students who were in a relationship/married had lower scores for perceived public stigma scales than those who were single (p = .024). In the multivariable adjusted model for perceived personal stigma toward mental health problems, medical students had significantly better attitudes toward mental health issues than other students. **Discussion and conclusion.** Stigma surrounding mental health disorders is prevalent in Pakistani society, even among the highly educated. Educational interventions are therefore required to improve university students' awareness and attitudes toward mental health disorders.

Keywords: Mental health, mental illness, stigma, students, Pakistan.

RESUMEN

Introducción. Las personas con trastornos de salud mental se enfrentan a juicios negativos y estigmatización significativamente mayores que quienes padecen otras enfermedades. Esto tiene un efecto perjudicial grave en la calidad de vida de los pacientes. **Objetivo.** Este estudio tuvo como objetivo evaluar el estigma que rodea a los trastornos mentales entre estudiantes pakistaníes de medicina, farmacia y ciencias de la salud afines. **Método.** Se realizó una encuesta transversal entre estudiantes de medicina, farmacia y ciencias de la salud afines en la Universidad de Lahore, entre abril y mayo de 2022. El estigma de la salud mental se evaluó utilizando una versión modificada de la escala de Discriminación-Devaluación (D-D). **Resultados.** Se incluyó a un total de 315 estudiantes en el estudio (edad media = 22,4 años, hombres = 51.1%). La mayoría de la muestra fueron estudiantes de farmacia (51.1%), seguidos de estudiantes de ciencias de la salud afines (35,2%) y estudiantes de medicina (13.7%). En un análisis de regresión múltiple, los estudiantes que tenían una relación o estaban casados obtuvieron puntuaciones más bajas en las escalas de estigma público percibido que los solteros (p = .024). En un modelo multivariable ajustado para el estigma personal percibido hacia los problemas de salud mental, los estudiantes de medicina mostraron actitudes significativamente mejores hacia estos problemas que otros estudiantes **Discusión y conclusión.** El estigma en torno a los trastornos de salud mental es un problema importante en la sociedad pakistaní, incluso prevalente entre los estratos con mayor nivel educativo. Por lo tanto, se necesitan intervenciones educativas para mejorar la concienciación y las actitudes de los estudiantes universitarios hacia los trastornos de salud mental.

Palabras clave: Salud mental, enfermedad mental, estigma, estudiantes, Pakistán.

INTRODUCTION

The prevalence of mental disorders has risen globally over the past three decades, from 654.8 million in 1990 to 970.1 million in 2019 (GBD 2019 Mental Disorders Collaborators, 2022). These disorders are not only the leading causes of disability, but also significant contributors to premature mortality. Although mental health problems affect all countries, certain countries are disproportionately affected, such as those facing natural catastrophes, war and conflict, economic turmoil, domestic violence, and poverty (Newnham et al., 2015; Alloh & Regmi, 2017; Alloh et al., 2018). These challenges mostly affect low- and middle-income countries (LMICs). Consequently, LMICs have a high prevalence of mental disorders, accounting for ≈80% of those living with mental disorders (Ojagbemi & Gureje, 2022). An umbrella review suggested a higher prevalence of mental disorders in South Asian countries (Hossain et al., 2020).

Pakistan, a lower-middle-income country in Southeast Asia, is the fifth most populous country in the world, with nearly 40% of its inhabitants living below the poverty line (Rana, 2023). Accordingly, the status of mental health issues there is a cause for concern. Although mental disorders account for at least 4% of the total disease burden in Pakistan, there is a dearth of qualified psychiatrists in the country (.19 psychiatrists/100,000 people) (Malik, 2023; Sikander, 2020). The majority of psychiatrists are clustered in major metropolises. Moreover, limited awareness of disease, religious and cultural beliefs, financial constraints, and lack of faith in psychological treatment prevent most families from seeking timely treatment of mental disorders (Alvi et al., 2023; Choudhry et al., 2023; Husain, 2020). Unfortunately, in addition to dealing with their illness, people with mental illness have to endure stigmatization (including stereotyping, prejudice, and discrimination). This leads to adverse consequences, such as reluctance to access psychiatric care, treatment non-compliance, poor self-esteem, hopelessness, social isolation, difficulty securing employment, bullying, and harassment (Alloh et al., 2018; Rössler, 2016).

Earlier research from Pakistan has shown that mental health issues are significantly stigmatized (Husain et al., 2020; Shafiq, 2020; Sultan, 2012; Waqas et al., 2014). In a recent study by Husain et al. (2020), the general public, students, and even healthcare professionals had higher stigma scores for mental than physical disorders.Waqas et al. (2014) reported that Pakistani university students have limited awareness of mental disorders, with many attributing these illnesses to supernatural causes, and some believing spiritual healers can cure them. An earlier survey of social sciences and education students showed that Pakistani students perceived higher stigma toward mental illnesses and negative attitudes toward psychological help-seeking than Turkish students (Sultan, 2012. Stigma among health sciences students is crucial, as they are future healthcare providers whose attitudes will have a major impact on patient care and public health education. However, to the best of our knowledge, no study has assessed perceived public and personal stigma toward mental disorders in Pakistani medical, pharmacy, and allied health sciences students. The primary objective of our study was therefore to investigate perceived public stigma and personal stigma toward mental illnesses among health sciences students. The secondary objective included identifying the factors associated with stigma toward mental illnesses in the study sample.

METHOD

Study design

A cross-sectional research design was used to achieve the study objectives.

Participants

This study was conducted among health sciences students (medicine, pharmacy, and allied health sciences) at the University of Lahore (UOL), from April to May 2022. UOL is one of the largest private universities, with over thirty thousand students, and multiple campuses across the Punjab province of Pakistan.

The sample size for the present study was calculated using the OpenEpi calculator for descriptive studies (https://www.openepi.com/SampleSize/SSPropor.htm). Setting a population size of 2,000 medical sciences students, 50% anticipated frequency, 95% confidence interval, and 5% margin of error yielded a sample size of 323.

Measurements

An anonymized, self-administered questionnaire was developed based on previous studies (Lally et al., 2013; Sultan, 2012; Link et al., 2001; Vogel et al., 2007). The questionnaire was thoroughly examined by a panel of seven experts from the field of health sciences. The panel recommended minor modifications to improve the clarity, comprehensibility, and cultural relevance of certain items. After the revisions, the questionnaire was approved for data collection. As the tertiary education instruction medium in Pakistan is English, the questionnaire was not translated into the local language (Urdu) (Salman et al., 2020a; Salman et al., 2020b; Salman et al., 2022a). The study instrument was pilot tested among 50 students, with findings revealing that both scales had acceptable internal consistency (Perceived public stigma scale: Cronbach's $\alpha = .731$; Personal stigma scale: Cronbach's $\alpha = .790$). The final draft of the study instrument had four sections.

- Section-I: This section collected demographic information on the study participants (age, gender, relationship status, and educational attainment).
- Section-II: This section explored the history of mental illness and its treatment and knowledge about someone having mental health issues.
- Section-III: This section evaluated perceived public stigma (PPS) toward individuals with mental illness. PPS was determined using the modified version of the Discrimination-Devaluation (D-D) scale (Lally et al., 2013; Link, 1987). This scale has been validated in general as well as university populations (Link et al., 2001; Link et al., 2001). It contains 12 items assessing respondents' level of agreement (5-point Likert scale; 1 = strongly agree and 5 = strongly disagree) on how most people will devalue or discriminate against a person suffering from a mental illness or a history of mental health treatment. The scale is designed so that a high level of perceived devaluation or discrimination is indicated by agreement with six of the items (Items 1–4, 8, and 10) and by disagreement with six others (reverse-coded questions: Item 5–7, 9, 11, and 12). A cumulative score was calculated by adding the scores of all 12 items (score range = 12–60), with a higher score corresponding to a higher degree of perceived stigma.
- Section-IV: This section evaluated respondents' personal stigma (PS) toward people with mental ailments and/or a history of mental illness treatment. PS was assessed using a 4-item scale, drawn from the D-D scale used in previous studies (Eisenberg et al., 2009; Lally et al., 2013). The scale contains two positively worded and two negatively worded items. The scores of all four items were added to formulate a cumulative score (range 4–20), with a higher score corresponding to a higher degree of personal stigma toward mental illness.

Procedures

We used a convenience sampling approach to recruit study participants. Students were approached by the researchers during university hours, who explained the study objectives. Those willing to take part in the study answered the anonymized study instrument.

Statistical analysis

All data analyses were performed using SPSS V 25. Continuous variables were presented as mean and standard deviation (*SD*) or median and interquartile range (IQR), depending on the distribution of continuous data. Numbers and percentages were reported for categorical variables. Continuous data were compared among dichotomous variables using the Mann-Whitney U test, while the Kruskal-Wallis test was used for polychotomous variables. Pairwise comparisons were made using Dunn's test to determine intragroup significance, and alpha inflation was controlled by the Bonferroni adjustment. Effect size was assessed by calculating r and ε^2 (epsilon-squared estimate) for the Mann-Whitney U and Kruskal Wallis H tests, respectively (Tomczak & Tomczak, 2014). Multiple linear regression analysis was performed to determine factors associated with stigma attached to mental illness. A p-value of less than .05 was taken as statistically significant for all data analysis procedures.

Ethical considerations

Ethical approval for the present study was obtained from the Research Ethics Committee, Department of Pharmacy Practice, Faculty of Pharmacy, UOL (REC/DPP/FOP/22). Informed consent was obtained from every student before enrolling them in the study.

RESULTS

Sample characteristics

As shown in Figure 1, a total of 400 students were approached by the researchers, 321 of whom provided consent and administered the study questionnaire (response rate = 80.3%). After cleaning the data and removing incomplete cases, we included 315 cases in the final analysis. Study participant demographics are given in Table 1. The mean age of students was 22.4 years (*SD* = 1.92). The proportion of male and female university students was 51.1% and 46.3%, respectively. The majority of the sample were pharmacy students (51.1%), followed by allied health sciences (35.2%) and medical students (13.7%). Fifty-eight students (18%) reported having a history of mental illness, and 42 reported having sought treatment for mental illness in the past year. Approximately 53% of the students reported knowing someone suffering from mental illness.

Perceived public and personal stigma toward mental illness

The median public stigma scale score was 37, indicating that nearly half the survey participants mirrored the negative attitude of the public toward mental health issues. Additionally, the IQR (Q1 = 35 and Q3 = 40.5) indicated that the majority of participants scored in the top quartile, reflecting a higher level of stigma toward mental disorders among the general public. Participants' responses to items assessing the stigma of mental health issues are shown in

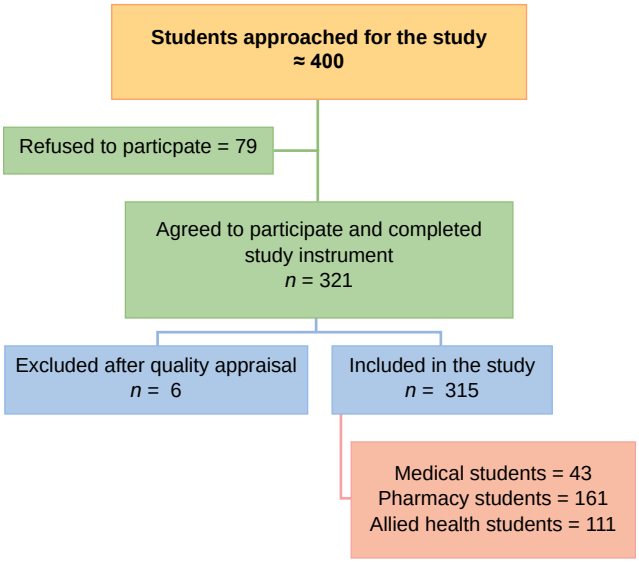

Figure 1. Participant recruitment flowchart.

Table 1
Sample characteristics

Characteristics	*N*	*%*
Age (22.44 ± 1.92 years)		
≤ 22 years	147	46.7
> 22 years	168	53.3
Gender		
Male	161	51.1
Female	146	46.3
Not indicated	8	2.5
Relationship status		
Single	251	79.7
Married/in a relationship	64	20.3
Degree course		
Medicine	43	13.7
Pharmacy	161	51.1
Allied health sciences	111	35.2
Self-reported history of mental illness		
Yes	58	18.4
No	257	81.6
Treated for mental illness in the past 12 months		
Yes	42	13.3
No	273	86.7
Do you know someone with a mental illness?		
Yes	168	53.3
No	147	46.7
Relationship to the person suffering from mental illness		
Friend	86	27.3
Family/relative	61	19.4
Partner	10	3.2
Acquaintance	16	5.1

Table 2. Only 56% believed most people would willingly accept a person who had received mental health treatment as a close friend, while 48.9% reported that the public would consider a person with a history of mental health treatment to be as intelligent as an average person. Moreover, a significant proportion of students believed it would be difficult for these individuals to secure employment even if they had fully recovered after receiving mental health treatment.

The median personal stigma scale score was 11, indicating that at least half the study sample had unfavorable attitudes toward individuals with mental health disorders. The IQR (9 to 12) revealed that most students scored in the upper range of the personal stigma scale, reflecting predominantly negative attitudes. Although 80% of students reported that they might befriend a person with a history of receiving mental health treatment, only 67% believed them to be as trustworthy as those without mental health illness (Table 2). Moreover, only 47.9% disagreed with the statement "I would think less of a person who had received mental health treatment". Lastly, 40% of students reported they would be reluctant to become involved in a relationship with someone who had received treatment for their mental health. Taken as a whole, the findings indicate significant stigma toward mental health in Pakistani society.

Factors associated with the stigma of mental illness

The comparison of stigma scale scores between participants' demographic and clinical variables is given in Table 3. There was no significant difference in PPS scores among all the variables except for relationship/marital status, with students in a relationship or married having significantly lower scores than those who were single (p = .006). Regarding personal stigma toward mental health issues, females had significantly lower scores than males (p = .011). Those reporting a positive history of mental illness had significantly lower stigma scores than other participants (p = .037).

We observed a statistically significantassociation between education and personal stigma scores (p = .006, ε^2 = .026). In pairwise comparisons using Dunn's test (Table 4), medical students had significantly lower stigma scores than pharmacy (p = .012) and allied health sciences students (p = .006).

We performed multiple regression analysis for both perceived public stigma and personal stigma scale scores to confirm the aforementioned associations. In multivariate analysis, students who were in a relationship or married had lower scores for perceived public stigma scales than those who were single (β = -.128, p =.024).

In our regression model for personal stigma toward mental health problems, education was found to be the only significant factor associated with stigma scores as medical students had better attitudes toward mental health issues than pharmacy and allied health sciences students (β = .165, p = .055 and β = .189, p = .024, respectively).

Table 2
Distribution of participants' responses to statements assessing mental health stigma

Statements	*Agreement N (%)*	*Neutral N (%)*	*Disagreement N (%)*
Perceived public stigma scale			
Most people would willingly accept a person who has received mental health treatment as a close friend	329 (55.9)	49 (15.6)	90 (28.6)
Most people believe that a person who has received mental health treatment is just as intelligent as the average person	154 (48.9)	58 (18.4)	103 (32.7)
Most people believe that a person who has received mental health treatment is just as trustworthy as the average person	159 (50.5)	69 (21.9)	87 (27.6)
Most people would accept a fully recovered person who has received mental health treatment as a teacher of young children in a public school	134 (12.5)	76 (24.1)	105 (33.4)
Most people feel that receiving mental health treatment is a sign of personal failure	179 (56.8)	51 (16.2)	85 (26.9)
Most people would not hire a person who had received mental health treatment to take care of their children, even if they had been well for some time	196 (62.2)	60 (19.0)	59 (18.8)
Most people would think less of a person who had received mental health treatment	185 (58.7)	59 (18.7)	71 (22.6)
Most employers will hire a person who has received mental health treatment if they are qualified for the job	155 (49.2)	77 (24.4)	83 (26.4)
Most employers will pass over the application of a person who has received mental health treatment in favor of another applicant	155 (49.2)	96 (30.5)	64 (20.3)
Most people in my community would treat a person who has received mental health treatment the same as they would anyone else	141 (44.7)	58 (18.4)	116 (36.9)
Most people would be reluctant to become involved in a relationship with a person who has received mental health treatment	182 (57.8)	78 (24.8)	55 (17.5)
Once they find out a person was in a mental hospital, most people will take their opinions less seriously	233 (74.0)	44 (14.0)	38 (12.0)
Personal stigma scale			
I would willingly accept a person who had received mental health treatment as a close friend	251 (79.7)	27 (8.6)	37 (11.7)
I believe that a person who has received mental health treatment is just as trustworthy as the average citizen.	212 (67.3)	61 (19.4)	42 (13.3)
I would think less of a person who had received mental health treatment	114 (36.2)	50 (15.9)	151 (47.9)
I would be reluctant to become involved in a relationship with a person who had received mental health treatment	126 (40.0)	100 (31.7)	89 (28.2)

Note: Agreement = sum of responses from agree to strongly agree; Disagreement = sum of responses from disagree to strongly disagree.

Table 3
Comparison of stigma scales score by demographic characteristics

	Perceived public stigma scale			*Personal stigma scale*		
Variable	*Mean rank*	*Test statistic (H/U)*	*Effect size (r/ε^2)*	*Mean rank*	*Test statistic (H/U)*	*Effect size (r/ε^2)*
Age		11260.50	-.076		11421.50	-.065
< 22 years	165.40			164.30		
> 22 years	151.53			152.49		
Gender		11593.50	-.012		9793.00*	-.145
Male	153.01			166.17		
Female	155.09			140.58		
Relationship status		6160.50**	-.163		7423.50	-.053
Single	165.46			155.58		
Married/in a relationship	128.76			167.51		
Degree course		1.129	.003		10.258**	.026
Medicine	155.01			117.57		
Pharmacy	162.82			162.04		
Allied health sciences	147.67			167.80		
Self-reported history of mental illness		7378.50	-.007		6160.00*	-.117
Yes	159.28			135.71		
No	157.71			163.03		
Previous treatment for mental illness		5090.50	-.066		5146.50	-.066
Yes	142.70			144.04		
No	160.35			160.15		
Do you know someone with a mental illness?		11388.50	-.067		11547.50	-.056
Yes	163.71			153.24		
No	151.47			163.45		

Note: * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4
Pairwise comparisons of personal stigma scale score between degree course categories

Sample 1-Sample 2	*Test statistic*	*SE*	*Std. test statistic*	*p*	*Adj. p**
Medicine-Pharmacy	-44.471	15.495	-2.870	.004	.012
Medicine-Allied health sciences	-50.232	16.214	-3.098	.002	.006
Pharmacy- Allied health sciences	-5.761	11.136	-.517	.605	1.000

Note: NB. Each row tests the null hypothesis that Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
* Dunn's proposed Bonferroni adjustment to control family-wise error rate (Type 1 error)

DISCUSSION AND CONCLUSION

The main findings of our study indicated that health sciences students believed the Pakistani public stigmatized mental health issues to a significant extent (perceived public stigma scale score: median = 35, and IQR 35 to 40.5). Moreover, the results of the personal stigma scale showed students also had unfavorable attitudes toward people with mental health issues, though medical students had better attitudes than pharmacy and allied health sciences students.

Low social acceptance of people with mental illnesses is reflected in students' responses to questions determining social stigma, and personal stigma toward these disorders. A significant proportion of students stated that most people would not socialize with a person who had received mental health treatment. Nearly half the students reported that the public would not consider a person with a history of mental health treatment to be as intelligent and/or trustworthy as an average person. In addition, study participants believed it would be hard for them to secure employment and become involved in a relationship even if they had fully recovered from the illness. These findings are consistent with the results of earlier studies reporting social stereotyping, prejudice, and discrimination against people with mental illness in Pakistan (Sultan, 2012; Daniel et al., 2021; Khan & Irfan, 2023; Mansoor & Warsi, 2023). A recent study revealed that patients with mental health disorders were stigmatized by society; they were called crazy, mocked, and even shunned by relatives (Khan & Irfan, 2023). Furthermore, people with mental disorders also have difficulty forming relationships (Khan & Irfan, 2023). Another study from Khyber Pakhtunkhwa, Pakistan, reported that 73% of patients reported being stigmatized due to their illness. Approximately 40% declared they were not accepted by others, and that this stigmatization was causing problems with their educational attainment, jobs, and relationships with family members (Daniel et al., 2021). These findings indicate that people with mental health issues experience negative judgments, discrimination and prejudice, with devastating consequences (Alloh et al., 2018; Rössler, 2016).

Regarding the factors associated with PPS, those married or in a relationship reported lower scores for perceived public stigma than those who were single. This is consistent with the findings of an earlier study (Getnet et al., 2022) in which single individuals were more likely to report higher perceived stigma than those who were married (adjusted odds ratio = 1.84, 95% CI: 1.12–3.02).

In the present study, the findings of the personal stigma scale also showed that students had negative attitudes toward mental health disorders. These findings are in line with previous studies highlighting negative, discriminatory attitudes among the general public, university students, and healthcare professionals toward mental disorders (Husain et al., 2020; Waqas et al., 2014). Consistent with the findings of an earlier study (Lally et al., 2013), we observed that students with a history of psychiatric illness had less stigma than others. This may well be linked to their lived experience, resulting in greater compassion and empathy, improved mental health literacy and a reduction in stereotypical thinking (Ahad et al., 2023; Corrigan & Watson, 2002). Our findings regarding females having less stigma toward mental illness than males were also in line with previous studies (Abdullah et al., 2021; Husain et al., 2020; Eisenberg et al., 2009). Our regression analysis showed that education was the main predictor of personal stigma in our sample. As expected, medical students had more positive attitudes toward mental health disorders than other students. This could be attributed to their having better insights into mental health disorders and also because they will be directly involved in providing care to such patients in the future. These findings indicate the need to improve mental health literacy among students, particularly non-medical students, by launching educational campaigns. Mental health disorders are becoming increasingly prevalent among Pakistani youth (Khan et al., 2021; Salman et al., 2022b; Salman et al., 2023). Accordingly, educational institutions should have effective student psychological and counselling service centers capable of providing appropriate psychological care to all students, faculty, and staff members (Mallhi et al., 2022). Lastly, although legislative steps have been taken to protect the rights of people with mental illness in Pakistan, effective practical implementation remains a major concern (Khan & Khan, 2021). There is therefore an urgent need for organized efforts to promote awareness, allocate resources, and implement a robust mental health policy to safeguard those affected.

Our study findings should be discussed in light of a few limitations. Firstly, convenience sampling was used to recruit the study sample, which may be associated with sampling bias. Secondly, since this study was conducted among medical, pharmacy, and allied health sciences students at a higher education institution in Lahore, Pakistan, its findings

might not be generalizable to the entire student population. Thirdly, this was a cross-sectional study, meaning that causality could not be determined. Lastly, although there were multiple negatively worded items in the study instrument to address cognitive bias/the halo effect (Mustafa et al., 2020), the self-reported nature of data collection means there may have been some degree of cognitive bias. We recommend a nationwide survey to evaluate mental health stigma among university students. Moreover, interventional studies are required to highlight the impact of educational campaigns on reducing the stigma of mental health disorders among university students.

In conclusion, stigma surrounding mental health disorders is prevalent in Pakistani society, even among highly educated sectors. Our study calls for regular educational interventions to enhance university students' awareness and attitudes toward mental health disorders.

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Conflict of interest

None declared.

Authors' contribution

All authors contributed equally to this research study.

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Drug Use Trends in Mexico City 1987–2021: Results of the IRSD

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ABSTRACT

Introduction. The Information Reporting System on Drugs (IRSD) developed in 1987 at the National Institute of Psychiatry Ramón de la Fuente Muñiz (INPRFM) is an early warning system that detects, analyzes and disseminates epidemiological information on the most relevant trends in psychoactive substances use in Mexico City, which is considered a public health problem mainly among young people. **Objective.** To analyze the main trends in psychoactive substances use by sex "ever use" for the period 1987–2021 with data from users collected in several institutions. **Method.** This study employs a repeated cross-sectional time series design. The information comes from 57,565 cases. IBM SPSS Statistics 29.0 software was used for data analysis and trends estimations. Time series at regular intervals were used to reveal the trends of the phenomenon over time. **Results.** Over the last 34 years, marijuana, cocaine and inhalants are the most widely consumed psychoactive substances in Mexico City, followed by amphetamines and opioids. Although men make up the largest proportion of users, there has been a gradual increase in the consumption of women, which in some periods has reached the same level as that of men. **Discussion and conclusion.** Consumption trends in Mexico City show some variations with respect to consumption trends at the international level, particularly in the cases of solvent inhalants and opioids.

Keywords: Early warning system, psychoactive substances use trends, Information Reporting System on Drugs (IRSD).

RESUMEN

Introducción. El Sistema de Reporte de Información sobre Drogas (SRID) desarrollado en 1987 en el Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz (INPRFM) es un sistema de alerta temprana que detecta, analiza y difunde información epidemiológica sobre las tendencias más relevantes del consumo de sustancias psicoactivas en la Ciudad de México, considerado un problema de salud pública principalmente entre los jóvenes. **Objetivo.** Analizar las principales tendencias del consumo de sustancias psicoactivas por sexo “alguna vez en la vida” para el periodo 1987–2021 con datos de usuarios recabados en varias instituciones. **Método.** Este estudio emplea un diseño de series de tiempo transversales repetidas. La información proviene de 57,565 casos. Para el análisis de datos y estimación de tendencias se utilizó el software IBM SPSS Statistics 29.0. Se utilizaron series de tiempo a intervalos regulares para revelar las tendencias del fenómeno a lo largo del tiempo. **Resultados.** En los últimos 34 años, la mariguana, la cocaína y los inhalables son las sustancias psicoactivas de mayor consumo en la Ciudad de México, seguidas de las anfetaminas y los opioides. Aunque los hombres constituyen la mayor proporción de usuarios, se ha observado un aumento paulatino del consumo de las mujeres, que en algunos periodos ha alcanzado niveles similares a los de los hombres. **Discusión y conclusión.** Las tendencias de consumo en la Ciudad de México muestran algunas variaciones respecto a las tendencias de consumo a nivel internacional, particularmente en los casos de los solventes inhalables y los opioides.

Palabras clave: Sistema de alerta temprana, tendencias de consumo de sustancias psicoactivas, Sistema de Reporte de Información sobre Drogas (SRID).

INTRODUCTION

The World Drug Report of the United Nations Office on Drugs and Crime (UNODC, 2024) reports that 292 million people aged 15–64 have used psychoactive substances at least once in their lifetime, an increase of 20% over the previous decade. The most used psychoactive substances are marijuana and cocaine. However, poly-drug use is the most frequent, ranging from experimentation to dependence.

Global psychoactive substances consumption trends

Psychoactive substances use worldwide show significant variations depending on the country, continent or region (Schneider et al., 2018; Kilmer & Midgette, 2017). In many countries there are psychoactive substances such as marijuana, cocaine, amphetamine-type stimulants and opioids, which show high consumption. In this regard, it is relevant to consider each type of psychoactive substance (UNODC, 2024).

Marijuana ranks first: 228 million people used it at least once in their lifetime in 2022; 4% of the world's population. The number of people using it is estimated to have increased by 21% in the last decade.

Opioids ranked second with 60 million people in 2022: 1.2% of the world's population. Of these, 31.5 million also consumed heroin, which is the most lethal psychoactive substances, causing the highest number of overdose deaths.

Amphetamine-type stimulants are in third place: 30 million people used them in 2022; .6% of the world's population. North America is the region with the highest consumption: in 2022, 20 million people consumed substances of the 3,4-methylenedioxymethamphetamine (MDMA) family, such as ecstasy, equivalent to .4% of the world population.

Fourth place is occupied by cocaine with 23.5 million people using it in 2022. The Americas, Western and Central Europe are major consumers, and North America is the main region of consumption with 2.1% of users.

On the one hand, cocaine use is associated with alcohol use (Liu et al., 2018). Recently, its use with fentanyl is reported, with a prevalence of 14.8%, in a sample of 25 US states (Wagner et al., 2023).

On the other hand, the use of inhalants has been a little studied phenomenon in large cities worldwide. In Mexico, its use is traditionally associated with vulnerable, marginalized and hard-to-reach groups (Ortiz et al., 2015), young men are the main consumers (Paredes et al. 2022). In the United States, the National Survey on Drug Use and Health (NSDUH, 2023) reports that 2.2 million people: .8% of the population, have used inhalants in the last year. In turn, Australia reports its use as a major health problem in vulnerable situation groups; affecting the weight and stature of users and increasing the likelihood of new psychoactive substances use (Crossin et al., 2017).

In Mexico, the Sistema de Vigilancia Epidemiológica en Adicciones (SISVEA, 2022) reports that marijuana and cocaine remain matters of concern: consumption continues to rise, while demand for treatment is declining.

According to the National Health and Nutrition Survey (ENSANUT, 2023), an estimated 12.5 million people (16.5%) have used illicit substances at least once in their lifetime, primarily within the 20 to 65 age range. The most commonly used substances among men in urban areas were marijuana (14.9%) and cocaine (4.0%). Use of crack, amphetamines, inhalants, and ketamine remains below 1.3%. Among adolescents aged 12 to 19, lifetime prevalence of illicit substance use is 4.3%, primarily marijuana (4.1%). Additionally, 67.6% of the population reports being aware of fentanyl use.

The National Survey on Drug, Alcohol, and Tobacco Use (ENCODAT, 2017) shows that among the general population aged 12 to 65, lifetime prevalence of any drug use increased from 7.8% in 2011 to 10.3% in 2016. Marijuana use was particularly notable, rising from 6.0% to 8.6%. Among adolescents aged 12 to 17, overall drug use increased from 3.3% in 2011 to 6.4% in 2016, and marijuana use specifically from 2.4% to 5.3%. The average age of initiation for all drugs decreased from 20.6 years in 2002 to 17.8 years in 2016. These findings underscore the urgency of strengthening public policies on prevention and treatment of addiction, with a particular focus on youth populations.

Early Warning Systems (EWS)

Different countries, such as Australia, Spain, Germany, the United States, Colombia and Argentina, operate early warning systems to identify consumption trends, changes in use patterns, new psychoactive substances and population groups at risk, among other indicators. Early warning systems are necessary to design prevention programs, awareness-education promotion, as well as to make public health, education, infrastructure and economic decisions (United Nations Secretariat of the International Strategy for Disaster Reduction [UNISDR], 2006; Organization of American States [OAS], 2019; Alejo & García 2021; Sutherland et al., 2022; Bencomo & Pinzón, 2023; Miranda, 2023).

As can be observed, psychoactive substance use remains high, contributing to the deterioration of both physical and mental health among the Mexican population. Therefore, in Mexico City, it is necessary to obtain regularly updated information that can support the design of public policies—particularly those focused on prevention, education, and risk reduction related to substance use, and aligned with changing consumption patterns.

Information Reporting System on Drugs

Mexico City (CDMX) has a local Early Warning System (EWS) for psychoactive substance use, known as the Information Reporting System on Drugs (IRSD). It was developed and is coordinated by the Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz (INPRFM). Since 1987, the IRSD has collaborated with government institutions and civil society organizations (CSOs), including Centros de Integración Juvenil, Hospital Fray Bernardino Álvarez, Hospital de Especialidades Toxicológicas Venustiano Carranza, Ministerios Públicos de la Fiscalía General de Justicia de la Ciudad de México, Casa Carrasco, and other key institutions.

The objectives of the IRSD are: 1. to provide a permanent and updated overview of consumption; 2. to monitor trends in use, its evolution over time, new psychoactive substances, consumption patterns and new forms of administration; 3. to identify user profiles in a target population of CDMX.

Therefore, the objective of this study is to present a first image about the most important consumption trends in CDMX during the period 1987–2021, using the epidemiological category "ever use", among psychoactive substances users according to IRSD.

METHOD

Study design

This is a repeated cross-sectional time series study designed to estimate consumption trends.

The data obtained constitute a “micro-model” of a broader, inherently “macro” problem, according to the consensus of participating experts. Therefore, if the results indicate changes in the variables included in the model, it can be inferred that the underlying issue within the surveyed population is evolving in the same direction.

Sample description

57,565 users evaluated during the period 1987–2021, through intentional sampling, in governmental institutions of the health (n = 40,809) and justice sectors (n = 14,336), as well as Civil Society Organizations (CSO) (n = 2,420). This indicates that participation is primarily oriented toward health institutions.

Measurements

The IRSD collects epidemiological information by means of the "Individual Report on Drug Use" questionnaire. It is applied to cases identified during the admission process to participating institutions in June and November. It has 28 items and evaluates the consumption of 12 psychoactive substances. Data are collected on use, route of administration, age of onset, reason for admission, and associated problems. The application time ranges from 30 to 45 minutes.

To ensure standardization of data collection across institutions, personnel responsible for administering the instrument receive training. The application process is supervised by researchers from the Institute. Furthermore, the same instrument and case criteria are consistently applied.

The instrument is completed by staff from the participating institutions who work directly with substance users. In certain cases, when necessary, researchers from the Institute assist with the questionnaires. Since 1987, the instrument has remained unchanged. However, new indicators are currently being explored.

The instrument’s validity—its ability to measure accurately and precisely—has been established through expert judgment. Experts have agreed on the relevance, clarity, and appropriateness of the items, as well as other factors enhancing its validity. Reliability, or consistency over time, has been demonstrated through 34 years of continuous application. The results allow for comparisons across different evaluation periods and help identify changes in patterns of substance use.

Procedure

Sampling criteria include all individuals admitted to the participating institutions during the evaluation periods who have consumed at least one psychoactive substance without a prescription at any point in their lives. These individuals are considered cases. Substances intended for medical use are included. Individuals who have only used alcohol or tobacco are excluded. This approach is referred to as purposive (intentional) sampling.

Statistical analysis

Data were analyzed using IBM SPSS Statistics 29.0 software. Time series at regular intervals were used, the aggregate of which reveals the trends of the phenomenon over time.

Nature of the results: The results are expressed in terms of trends: a series of three or more successive measurements that point in the same direction and thus reflect the values of the variables of the phenomenon. The set of these variables constitutes a micro-level model of the phenomenon of psychoactive substances dependence, which by its nature is macro. The results indicate the internal proportions of the phenomenon regardless of its magnitude, a subject that corresponds to other methodologies based on population censuses where the interest is to know the size

of the phenomenon. In the case of the IRSD, it is of interest to know the proportions of users of each of the substances, as well as their variations over time.

Ethical considerations

The information collected by IRSD is anonymous and confidential. This follows the ethical guidelines of the Council for International Organizations of Medical Sciences (CIOMS, 2016) in collaboration with the World Health Organization and the Helsinki declaration of the World Medical Association (WMA, 2017).

RESULTS

Sociodemographic characteristics of the users as well as the main consumption trends in the epidemiological category "ever use" are presented.

User profile

Table 1 shows the main demographic variables, such as sex, age, occupation and socioeconomic level of the 57,565 records obtained during the last 34 years. The majority of the users are men: 86.6% (n = 49 816) with a smaller proportion of women 13.4% (n = 7 693). 61.5% (n = 35,338) are between 15 and 27 years of age; this age range accounts for the highest consumption of marijuana, cocaine and inhalants. Most are formally employed 26.5% (n = 14,550), with a significant number of students 24% (n = 13,188) and unemployed 21.6% (n = 11,824). Almost all are of middle and low socioeconomic level 99.1% (n = 52,617).

Table 1
User profile

Sociodemographic characteristics N = 57,565	*n*	*%*
Sex		
n = 57,509		
Male	49,816	86.6
Female	7,693	13.4
Age (years)		
n = 57,476		
Under 14	4,655	8.1
15 to 27	35,338	61.5
28 to 39	12,611	21.9
40 to 48	3,470	6.0
49 or more	1,402	2.4
Occupation		
n = 54,864		
Unemployed	11,824	21.6
Others	1,263	2.3
Student	13,188	24.0
Formal employee	14,550	26.5
Informal employee	13,530	24.7
Professional	509	.9
Schooling		
n = 56,039		
None	646	1.2
Primary	9,134	16.3
Secondary	25,190	45.0
Technique	2,381	4.2
High School	14,370	25.6
Bachelor's Degree	4,190	7.5
Postgraduate	128	.2
Socioeconomic level		
n = 53,072		
Low	23,826	44.9
Medium	28,791	54.2
High	455	.9

Trends in "ever use" consumption[1]

The most commonly used psychoactive substances in Mexico City are marijuana, cocaine and inhalants. Their trends have varied during the study period due to changes in supply and demand, availability, changes in the legal status of the substances, sociocultural context, etc.

Data for each psychoactive substance are presented below.

Data for each psychoactive substance are presented below

Figure 1 shows different moments in the use of marijuana, cocaine and inhalants.

In 1987, the marijuana level was 70.5% and remained at this level until 1997. Between 1998–2000 it reaches 56%. From 2001 to 2006 it reaches a level of 70.6% and drops in 2007 to 56.1%. The year 2014 reaches the highest point with 89.9% as indicated. In 2021, marijuana use accounted for 65.9%, indicating that its prevalence has remained high and stable throughout the evaluation period.

Cocaine in the years 1987–1991 shows low levels: between 3% and 8%. However, from 1992 to 1999 it increases considerably: from 10.8% to 67.9%. This shows the profile of an epidemic, and consumption surpasses marijuana between 1998–2003. This continues until 2006 with levels of 60%. By 2008 it decreases to 48.7%, which is similar to inhalants. This level is maintained until 2016 with around 40%. Since 2017, an increase to 60% has been reported, which represents a significant rise compared with the first evaluation conducted in 1987.

The consumption of inhalants in 1987 was 55.3%, later rising to 60%; it decreased from the 1990s onwards and reached its lowest level in 2005 with around 30%. In 2006, consumption exceeded 40%. From that point onward, the

[1] The variations observed in 2020 and the first half of 2021 are a result of underreporting due to the COVID 19 pandemic.

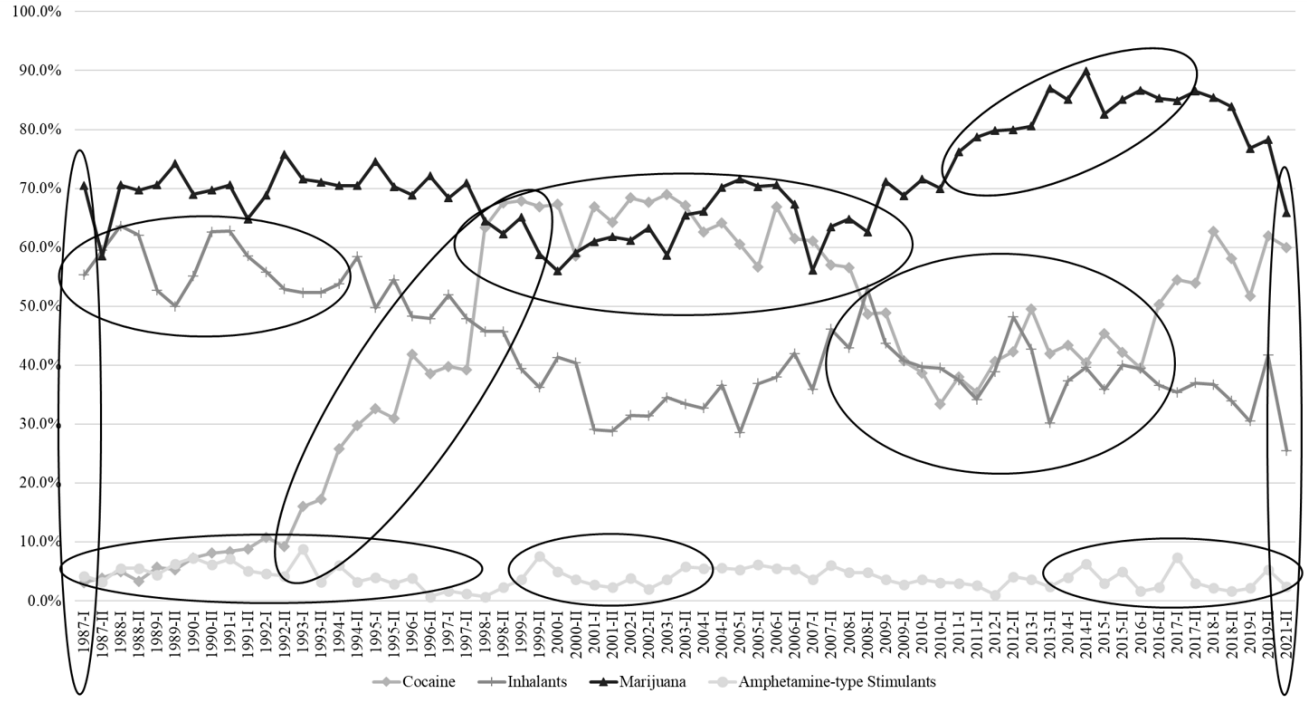

Figure 1. Ever use trends of psychoactive substances, 1987 to 2021.
Note: Data for 2020 and the first half of 2021 are not included due to the Covid-19 pandemic.

trend continued with slight variations until 2021, when it declined to 25.5%. As can be observed, inhalant use has shown an irregular pattern from the first evaluation through 2021.

The use of amphetamine-type stimulants shows a trend of less than 10% throughout the evaluation period. Consumption was highest in the first half of 1993 with 8.8%. In subsequent evaluations, consumption remained around 3.9%. In 2021, it was 2.4%, representing a decrease of 1.8% compared to the first evaluation conducted in 1987.

Trends in "ever use" consumption by sex

Figure 2 shows that the proportion of marijuana use is higher in men from 1987 to 2012, with a trend of around

Figure 2. Ever use trends of marijuana by sex.
Note: Data for 2020 and the first half of 2021 are not included due to the Covid-19 pandemic.

70%. However, it is striking that the proportion of women is equal to that of men in the years 1990, 2005 and 2013. For the period 2014–2017 women outnumber men in some assessments. Recently, consumption levels are similar in both sexes.

Figure 3 shows that the proportion of cocaine use among men and women shows slight variations during the period 1987–1998, despite the increase in the trend from 3.8% to 69.7%. From 1998 to 2000, use increases between men and women: 50% and 70% respectively. From 2006 to 2011 the consumption levels of men are higher than those of women, however, the consumption gap between both sexes is more marked between 2013 and 2016. The highest point of consumption for both sexes occurs in 2000 and 2002

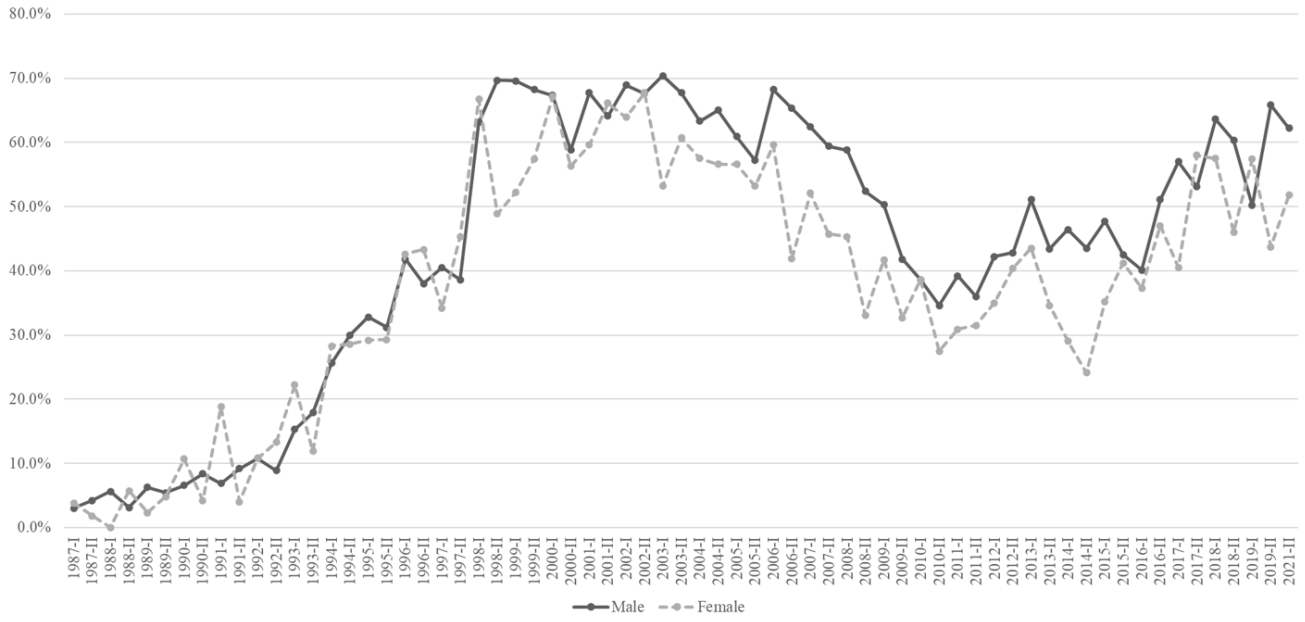

Figure 3. Ever use trends of cocaine by sex.
Note: Data for 2020 and the first half of 2021 are not included due to the Covid-19 pandemic.

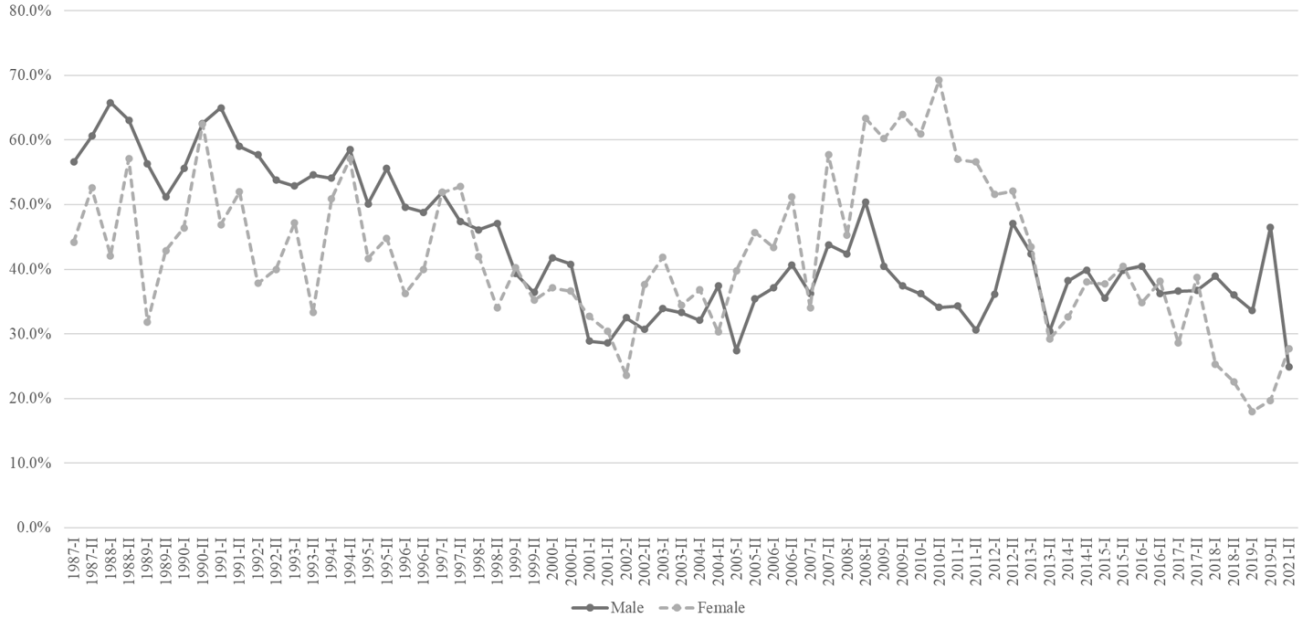

Figure 4. Ever use trends of inhalants by sex.
Note: Data for 2020 and the first half of 2021 are not included due to the Covid-19 pandemic.

with around 70% in both cases.

Figure 4 shows that inhalants use among men is higher in 1991 and 1994. Between 2002 and 2012, women's consumption increases substantially in relation to men: around 40% for men and 70% for women; to decrease in this group to 18% in 2019. In 2021 it decreases for men and women: about 10% and 20%, in each case.

Figure 5 shows that the proportion of amphetamine-type stimulant use is higher among women: over 20% during the evaluation period. Starting in 2003, the gap between both sexes decreases. In 2021, men and women show decreases with trends of 2.4% and 2%, respectively.

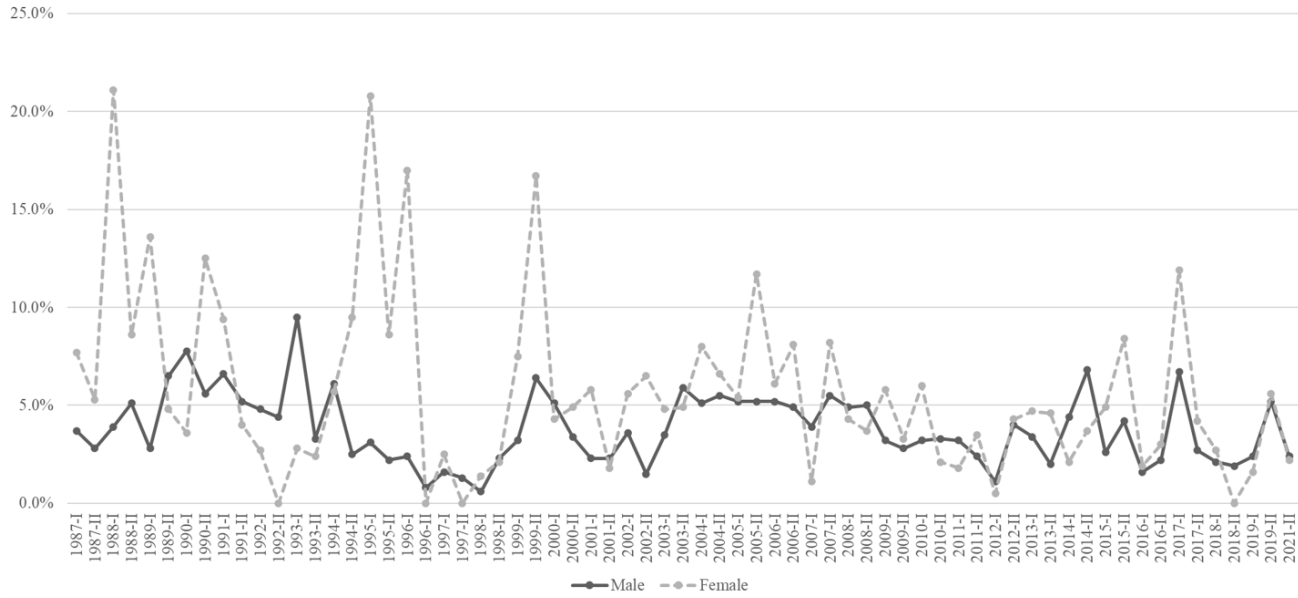

Figure 5. Ever use trends of amphetamine-type stimulants by sex.
Note: Data for 2020 and the first half of 2021 are not included due to the Covid-19 pandemic.

DISCUSSION AND CONCLUSION

Psychoactive substances use trends in Mexico City coincide with the global picture in the high levels of marijuana and cocaine use (UNODC, 2024). The high and stable consumption of marijuana over more than three decades shown by the IRSD is also consistent with reports from the Sistema de Vigilancia Epidemiológica en Adicciones (SISVEA, 2022) indicating that it is the number one psychoactive substances of initiation in the country from 1994 to 2023. This is consistent with epidemiological data from the Centros de Integración Juvenil, which identify marijuana as the most commonly used illicit drug—ever used in a lifetime—among individuals who sought treatment at that institution between 2004 and 2024 (CIJ, 2025). This high consumption is related to its high availability, low cost and the erroneous perception that it is not very dangerous because, according to users, "it is of natural origin".

The sociodemographic characteristics of the 57,565 users recorded by the IRSD indicate that young males—between 15 and 39 years of age—are the primary users of psychoactive substances. This finding is consistent with the reported increase in marijuana use among individuals under 18 years of age, as noted by the CIJ (Díaz-Negrete, 2017). These data also reveal that this group is at a disadvantage, largely due to psychosocial factors inherent to this stage of development. Consequently, this population becomes a priority for intervention through prevention efforts, demand reduction programs, and treatment services for substance use.

Additionally, the acquisition of this substance has expanded through the Internet and social media platforms (CONASAMA, 2024). According to Perales (2021), social media portrays substance use as a positive behavior, creating ambivalence and confusion between the messages promoted by prevention campaigns and the information presented in the media.

Cocaine consumption escalated to significant levels during the 1990s and became a popular substance, highly available and inexpensive, used in less favored social strata (Unikel et al., 1998). For Del Bosque et al. (2014), in the first decade of the 2000s, the increase in consumption was due to the closure of the Caribbean route to move the psychoactive substance from the Andean region to the United States and Europe and is then taken through the Central America-Mexico corridor. This spread its use in our coun-

try: between 1988 and 2008, consumption increased more than sevenfold: from .3% to 2.6% in the population aged 12 to 65(Ministry of Health, 2008).

For the IRSD, cocaine use between 1987 and 2003 presents three moments: the first, from 1987 to 1992, with a low level, lower than marijuana and solvent inhalants; the second from 1992 to 1998, with the highest consumption peak; and the third, from 1998 to 2003, in which it remained stable in first place, increasing in 2003 (Ortiz, 2005). The period from 1998 to 2015 had the highest number of users of this psychoactive substance (Romero et al., 2019) and subsequently consumption levels like solvent inhalants.

The use of inhalants attracts attention because they are products for industrial use, contain volatile substances, cause psychoactive effects, and are the third most commonly used psychoactive substance by young people. However, on the world scene there are places, such as the United States, where they constitute a serious phenomenon but are currently little studied. In this regard, in the United States it is reported that 2.2 million people used inhalants in the last year prior to the study according to the National Survey on Drugs and Health 2022 (NSDUH; 2023); while Australia, as noted, reports the use of inhalants as a major health problem in vulnerable situation groups (Crossin et al., 2017).

In Mexico, their use has historically been among vulnerable, marginalized, hidden and hard-to-reach groups (Ortiz et al., 2015). It is in the 1960s that they were studied as substances of abuse, they were called “psychoactive substances of poverty". Over time, their use permeates the middle classes and is currently reported in various population groups: adolescents, students and groups that subsist on the street. This is due to its low price, diversity of presentations, multitude of places of sale, ease of carrying and handling, as well as the apparent safety of the effects (Ortiz et al., 2015; Medina-Mora et al., 2015; Kurtzman et al., 2001). Of great concern is this consumption, as there is now evidence that repeated exposure to toluene, for example, produces significant cognitive and psychomotor deficits (Cruz et al., 2019).

The trend in the use of amphetamine-type stimulants, specifically "crystal meth" and "ecstasy" (MDMA), is in fourth place. Crystal shows low levels, but its use tends to increase. This coincides with SISVEA reports, which report the increase of crystal meth as a psychoactive substance of initiation from 2.4% in 2016 to 9.3% in 2022. Similarly, its variation as an impact psychoactive substance goes from 22.9% in 2016 to 58.8% in 2022, thus surpassing cocaine and becoming the most reported impact psychoactive substance. Currently, users of treatment centers in 24 entities in the country report crystal meth as the most frequent impact psychoactive substance (SISVEA, 2020, 2022). The National Commission on Mental Health and Addictions (CONASAMA) in the International Narcotics Control Board (INCB, 2023) confirms the increase of crystal meth consumption in the country: of 218% between 2017 and 2022.

Amphetamine stimulant use trends by sex show higher consumption among males, although they also reveal that females are approaching male levels (Del Bosque, 2014; Villatoro et al., 2017; Romero et al., 2019, SISVEA, 2022). Therefore, the increase in psychoactive substance use and its significant impact on the health of both men and women require a comprehensive public policy approach. This should include measures for prevention, treatment, and social reintegration. Furthermore, emphasis must be placed on strengthening related areas such as mental health education, among others (CONASAMA, 2024).

Among the limitations of this study are the nature of the repeated cross-sectional design and the use of intentional sampling, which require a distinct statistical approach to identify future trends in substance use. Another limitation is the current inability to conduct analyses by geographic zone—such as users’ place of residence, locations of substance use, or geographic availability of treatment services. This limitation arises from the use of intentional sampling, which restricts the generalizability of the data.

With regard to COVID-19, this variable is considered extraneous, as it prevented users from attending treatment centers. As a result, institutions experienced reduced demand for services, and the data collection process was limited by institutional policies aimed at preventing contamination.

Finally, IRSD data from the last three decades show that psychoactive substance use in Mexico City is dynamic and multifactorial. This underscores the need for permanent monitoring, and therefore an early warning system such as IRSD is important to identify risk groups, psychoactive substance of use, the trajectory of the phenomenon, health risks, promote the dissemination of findings on new substances, patterns of use, etc. The SISVEA (2022) agrees, noting that in recent years marijuana is the main psychoactive substance of initiation at national level. However, increasingly younger users are starting with amphetamine-type stimulants, such as crystal meth, which has displaced inhalants since 2017.

The IRSD is an early warning system that has been in place for more than three decades in Mexico City. Its operation has helped to identify trends in psychoactive substance use, has supported decision-making, the design of public policies and other measures that have contributed to improving the care provided to users. The phenomenon of psychoactive substance use is dynamic and requires permanent monitoring; this makes the operation of this system necessary to identify changes in trends, particularly new substances, such as recently the use of fentanyl, an opioid identified by the IRSD in Mexico City since 2018 (Ortiz et al., 2018; Romero et al., 2019). This psychoactive substance is used especially among young people, and this imposes significant challenges to the health system. In this regard, CONASAMA (2024) reports that since 2018, cases of fentanyl users have been

received in treatment centers, growing from 10 cases in 2018 to 430 cases in 2023, mainly in the north of the country. This psychoactive substance is of concern due to its high addictive potential and high risk of life-threatening overdose (Cruz et al., 2023), as users consume the clandestinely manufactured one, mixed with other psychoactive substances such as cocaine, MDMA and heroin (National Institute on Drug Abuse [NIDA], 2021). As a result, users are unaware that it contains numerous unknown substances, and this increases the risk of overdose and even death.

In the future, the IRSD should obtain information on new psychoactive substances among vulnerable situation groups: migrants coming from both provincial and rural areas of the country, those coming from Central and South America, as well as Africa and settling in Mexico City; in addition to street populations, indigenous people and the LGBTQ+ community, etc. It is also necessary to monitor the entry/exit of psychoactive substances in the market and the new distribution-consumption scenarios, based on strengthening inter-institutional links to expand epidemiological surveillance. In this regard, Albores-García et al. (2023) point out that to prevent or reduce the number of deaths related to new opioids, such as fentanyl, it is necessary to maintain surveillance programs to monitor trends in psychoactive substances use, as well as to be vigilant in the rapid identification of new psychoactive substances.

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Conflict of interest

The authors declare that they have no conflict of interest.

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Retrospective Cross-sectional Statistical Analysis of Sociodemographic Characteristics and Diagnoses at the Temazcalli Institute for Prevention and Rehabilitation

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ABSTRACT

Introduction. Despite the pressing need for robust data to guide mental health and addiction strategies in Mexico, few studies have systematically analyzed patient profiles and diagnostic patterns in specialized centers. This study addresses that gap by performing a retrospective, cross-sectional, descriptive analysis of the records of the Temazcalli Institute for Prevention and Rehabilitation. **Objective.** To describe the sociodemographic variables and primary diagnoses of patients treated for addictions and mental health disorders at the Temazcalli Institute between January 2021 and May 2024. **Method.** A retrospective, cross-sectional, descriptive study was conducted using 1,520 outpatient records and 432 first-time diagnoses, analyzed in R (v4.3). Mann-Whitney U test, Spearman correlations, and frequency analyses were applied to explore associations between age, sex, and number of diagnoses. **Results:** The research sample was predominantly male (64.1%), with a median age of 18 years, with 79.3% aged 30 or less. The mean number of diagnoses per patient was 2.6 (SD = 1.4) and showed a positive correlation with age (ρ = .31; p < .001). The most common diagnoses included ADHD (23.8%), cannabis use disorder (16.2%), and stimulant use disorder (16.0%). **Discussion and conclusion.** These findings provide essential evidence to inform the design of targeted preventive interventions at Temazcalli and similar centers. The results underscore the importance of early, youth-focused strategies and integrated clinical and policy approaches to address mental health and addiction issues.

Keywords: Addictions, mental disorders, Temazcalli Institute, demographics, diagnoses.

RESUMEN

Introducción. A pesar de la urgente necesidad de contar con datos sólidos que orienten las estrategias en salud mental y adicciones en México, pocos estudios han analizado de manera sistemática los perfiles de los pacientes y los patrones diagnósticos en centros especializados. Este estudio aborda esa laguna mediante un análisis transversal, descriptivo, y retrospectivo de los registros del Instituto Temazcalli de Prevención y Rehabilitación. **Objetivo.** Describir las variables sociodemográficas y los diagnósticos principales de los pacientes atendidos por adicciones y trastornos de salud mental en el Instituto Temazcalli entre enero de 2021 y mayo de 2024. **Método.** Se realizó un estudio transversal, descriptivo, y retrospectivo utilizando 1 520 expedientes de atención ambulatoria y 432 diagnósticos de primera ocasión, analizados en R (v4.3). Se aplicaron la prueba U de Mann-Whitney, correlaciones de Spearman y análisis de frecuencias para explorar las asociaciones entre edad, sexo y número de diagnósticos. **Resultados.** La muestra del estudio fue predominantemente masculina (64.1 %) con una mediana de edad de 18 años; el 79.3 % tenía 30 años o menos. El número medio de diagnósticos por paciente fue 2.6 (DE = 1.4), el cual mostró una correlación positiva con la edad (ρ = .31; p < .001). Los diagnósticos más comunes incluyeron TDAH (23.8 %), trastorno por consumo de cannabis (16.2 %) y trastorno por consumo de estimulantes (16.0 %). **Discusión y conclusión.** Estos hallazgos proporcionan evidencia esencial para diseñar intervenciones preventivas específicas en el Temazcalli y centros similares. Los resultados destacan la importancia de estrategias tempranas enfocadas en población joven, así como de enfoques clínicos y de política integrados para abordar los problemas de salud mental y adicciones.

Palabras clave: Adicciones, trastornos mentales, Instituto Temazcalli, demografía, diagnósticos.

INTRODUCTION

Substance abuse and mental health disorders have gained attention, particularly due to the increase in their incidence in the wake of the COVID-19 pandemic. Public measures implemented to curb the spread of the virus led to a rise in mental issues such as domestic violence, unplanned pregnancies, loss of loved ones, suicide, anxiety, depression, and increased drug abuse (Carrascoza et al., 2022). Although social, economic, and political crises in Mexico have affected the mental health of its population, the mental health response has been insufficient.

According to a National Survey of Psychiatric Epidemiology conducted in 2001, approximately 28.6% of the Mexican population had presented at least one of the 23 ICD disorders at some point in their lifetime. This figure was equivalent to approximately six out of every 20 individuals. Anxiety disorders were the most common (14.3%), followed by substance use (9.2%) and affective disorders (9.1%) (Medina-Mora et al., 2003). According to a recent study, 15.7 million people were affected by some form of mental disorder in Mexico in 2019, rising to 18.1 million in 2021, a 15.4% increase (Medina-Mora et al., 2024).

Mexico's 2020-2024 Mental Health and Addictions Program (PAE-SM20-24) is facing delays in meeting service demand due to insufficient infrastructure and staff shortages (Vargas et al., 2023). Efforts have focused on hospitals, overlooking prevention and mental health promotion. Despite the severity of addictions, efforts remain limited. Mexico is now beginning to treat addictions as a public health issue, however, developing targeted, gender- and age-specific treatment programs.

In Mexico City, the Diagnosis and Evaluation of Mental Health Services (2018–2022) highlights the work overload and lack of resources, negatively impacting service quality, despite high user ratings. The Mexican Ministry of Health has implemented a network of 334 Specialized Addiction Units (UNEMES), also known as Primary Care Addiction Centers (CAPA), providing an evidence-based early intervention model (Martínez-Martínez et al., 2020).

Since 1984, Youth Integration Centers (CIJ) and the Temazcalli Institute for Prevention and Rehabilitation in San Luis Potosí have provided long-term addiction treatment services. In 2002, the Temazcalli Institute created the Child and Adolescent Health Department to provide mental health treatment for youth with behavioral and emotional problems (Hernández Blanco et al., 2014). The Temazcalli Institute prioritizes patient autonomy and voluntary treatment, upholding human rights. Since 2009, the Mexican government has regulated addiction treatment centers through the Official Mexican Standard (NOM-028-SSA2-2009), which sets certification standards for addiction centers across professional, mixed, and mutual aid care models (Rafful et al., 2020).

The Temazcalli Institute implements a multidisciplinary approach focused on patients with dual pathology, establishing a biostatistics unit to gather and analyze the data collected (Ponz Martínez, 2023). While national surveys provide prevalence estimates at the population level and global reports offer broad comparisons, there is a dearth of center-specific analyses to inform evidence-based clinical protocols and public health policies. Moreover, previous research, both in Mexico and internationally, relies on cross-sectional snapshots or limited samples, without incorporating methods to examine temporal and correlational dynamics among key variables.

By applying rigorous cross-sectional, descriptive, and retrospective techniques, incorporating nonparametric tests, correlation analyses, and frequency distributions, this study seeks to address existing gaps in the scientific literature. It also seeks to provide valuable insights into the demographic and diagnostic landscape of patients at the Temazcalli Institute. The findings contribute to the epidemiological understanding of substance use and mental health comorbidities in Mexico and inform biostatistical approaches in similar healthcare settings worldwide.

METHOD

Study design

A cross-sectional, descriptive, and retrospective study was conducted.

Participants

The sample includes 1,520 male and female patients, aged 1 to 77, whose data were collected from two databases provided by the Temazcalli Institute. These databases include all currently active users from January 2021 to May 2024, meaning that the user is currently receiving treatment and has not missed any of their appointments or therapies for at least six months. It comprises patients treated at any of the clinical and paraclinical areas of the Institute, as well as all first-time users. The latter include patients who come to the Temazcalli Institute for the first time and receive a diagnosis under the classification of mental, behavioral, and neurodevelopmental disorders described in the ICD-10 and DSM-5.

Measurements

Data were obtained from two databases provided by the Temazcalli Institute for Prevention and Rehabilitation:

i. Outpatient medical records database: every user included in the Daily Outpatient Register
ii. First-time diagnoses database: includes every first-time user in a separate database

These databases collect information through daily forms created by the Institute's biostatistics department and completed individually by each therapist (both psychiatrists and psychologists) during consultations. These forms include demographic information on patients, such as age and sex, as well as the diagnoses provided by the therapist, including ICD-10 codes.

Procedures

The cooperation of the Temazcalli Institute was formally requested through a letter addressed to the research committee. Access to the databases of the biostatistics department was granted after the project presentation.

Statistical analyses

All statistical analyses were performed using R statistical software (version 4.3.1). Continuous variables are presented as medians with ranges or standard deviations (*SD*). Age differences between men and women were evaluated using a two-sided, unpaired Mann-Whitney U test (α = .05). The association between age and number of diagnoses was assessed with a Spearman's rank correlation, given the non-normal distribution of the data, as confirmed by Shapiro-Wilk tests. Data visualization included frequency tables and graphical representations of patient distribution by age and sex, population characteristics, diagnosis frequency by age group, sex-stratified prevalence of common diagnoses, and relationships between diagnostic categories.

The study population was stratified into four age groups: children (0–11 years), adolescents (12–17 years), adults (18–59 years), and elderly adults ($\geq$ 60 years). For the analysis focused on initial diagnosis, the first approach taken by the psychiatrist or psychologist to identify the cause of the patient's illness or health condition events, the population was further stratified into two groups: youth ($\leq$ 18 years) and adults ($\geq$ 18 years).

For the analysis of diagnoses, cases were categorized according to the DSM-5. Cases lacking assigned diagnoses were excluded. Additionally, for the examination of associations among diagnostic categories, single-diagnosis patients were excluded.

Ethical considerations

This study was approved by the Ethics Committee of the Temazcalli Institute with code ITPR-EEI-PI-001-24 on May 31, 2024, and by the Ethics Committee of the Universidad del Valle de México, San Luis Potosí campus, with registration number CSUVM072024 on August 12, 2024.

RESULTS

Analysis of daily patient records from the outpatient medical records database

First, we analyzed the outpatient medical records database with a sample of 1,520 users. Average patient age was 20 years (*SD* = 14.4; range: 1–77). Most of the patients treated were male, representing 64.1% [975 out of 1520]. A Mann-Whitney U test revealed a statistically significant difference in age distribution between the sexes (W = 208,674; p < .001). Female patients were older on average (mean age: 23.7, *SD* = 16.3; range: 1–77) compared to male patients (mean age: 17.9, *SD* = 12.8; range: 1–72).

Children and adolescents constituted the largest demographic segment, accounting for 58.2% of the total population at the Institute. A total of 76% of the children and 60% of the adolescents and adults were male. Conversely, 67% of the elderly patients were female, although this group only included 30 patients (Figure 1, Table 1).

An analysis of the diagnoses per patient (Table 1) was conducted, excluding four cases without assigned diagnoses (likely new patients). Among the remaining 1,516 patients, the mean number of diagnoses per patient was 2.6 (SD = 1.4; range: 1-9). A positive correlation between age and number of diagnoses was identified, using the Spearman's rank correlation coefficient (ρ = .31, p < .001), indicating an increase in diagnostic burden with advancing age. An analysis by age group showed that children had an average of 2.07 diagnoses (*SD* = .83; range: 1–5). Adolescents had an average of 2.36 diagnoses (*SD* = 1.20; range: 1–8), while adults had an average of 3.20 diagnoses (*SD* = 1.65; range: 1–9). Notably, only .5% of adults had nine diagnoses. Finally, elderly adults had an average of 2.73 diagnoses (*SD* = 1.01; range:1–5) (Figure 2).

Analysis of diagnoses extracted from the daily updated outpatient medical records database

Second, we analyzed the first-time diagnoses database containing a total of 432 patients with 87 different diagnoses. A summary of findings is given in Table 2.

In Table 2, the most common diagnoses are presented in general and by age group. Attention deficit hyperactivity disorder (ADHD), predominantly the inattentive type (F90.0), accounted for 23.8% of cases. This disorder was also among the six most common diagnoses, together with cannabis dependence without complications (F12.20), with 16.2%, other stimulant dependence without complications (F15.20), with 16%, alcohol dependence without complications (F10.20),

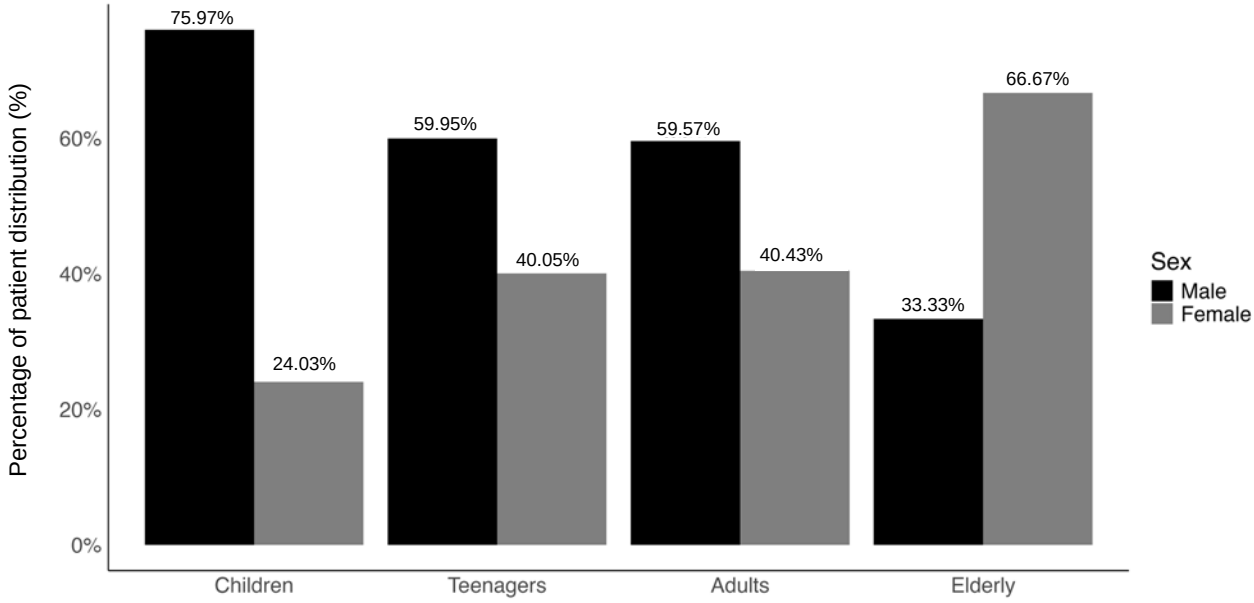

Figure 1. Percentage of patient distribution by sex and age group in open database.
Note: This chart shows the proportion of the total number of patients by gender, with men representing 64.1% (*n* = 975), and women 35.9% (*n* = 545) as well as the proportion by gender of the age groups (adults, children, adolescents, and the elderly).

Table 1
Population characteristics

Characteristics	*Children (n,%)*	*Teenagers (n,%)*	*Adults (n,%)*	*Elderly (n,%)*	*Total (n,%)*
Sex					
Male	351 (75.97%)	253 (59.95%)	361 (59.57%)	10 (33.33%)	975 (64.14%)
Female	111 (24.03%)	169 (40.05%)	245 (40.43%)	20 (66.67%)	545 (35.86%)
Total sex	462 (30.39%)	422 (27.76%)	606 (39.87%)	30 (1.97%)	1520 (100.00%)
Diagnostics					
1	111 (24.18%)	106 (25.12%)	98 (16.2%)	4 (13.33%)	319 (21.04%)
2	234 (50.98%)	157 (37.2%)	123 (20.33%)	7 (23.33%)	521 (34.37%)
3	91 (19.83%)	97 (22.99%)	158 (26.12%)	13 (43.33%)	359 (23.68%)
4	18 (3.92%)	37 (8.77%)	105 (17.36%)	5 (16.67%)	165 (10.88%)
5	5 (1.09%)	17 (4.03%)	63 (10.41%)	1 (3.33%)	86 (5.67)
6	0 (0%)	6 (1.42%)	31 (5.12%)	0 (0%)	37 (2.44%)
7	0 (0%)	1 (0.24%)	21 (3.47%)	0 (0%)	22 (1.45%)
8	0 (0%)	1 (0.24%)	3 (0.5%)	0 (0%)	4 (0.26%)
9	0 (0%)	0 (0%)	3 (0.5%)	0 (0%)	3 (0.2%)
Total diagnostics	459 (100%)	422 (100%)	605 (100%)	30 (100%)	1516 (100%)

Note: This table shows the characteristics presented by the sample of patients, such as gender (male or female), their age group, considering patients from 0 to 11 years old as children, those from 12 to 17 years old as adolescents, those from 18 to 59 years old as adults, and those aged 60 years and over as elderly; as well as the number of diagnoses per patient by age group.

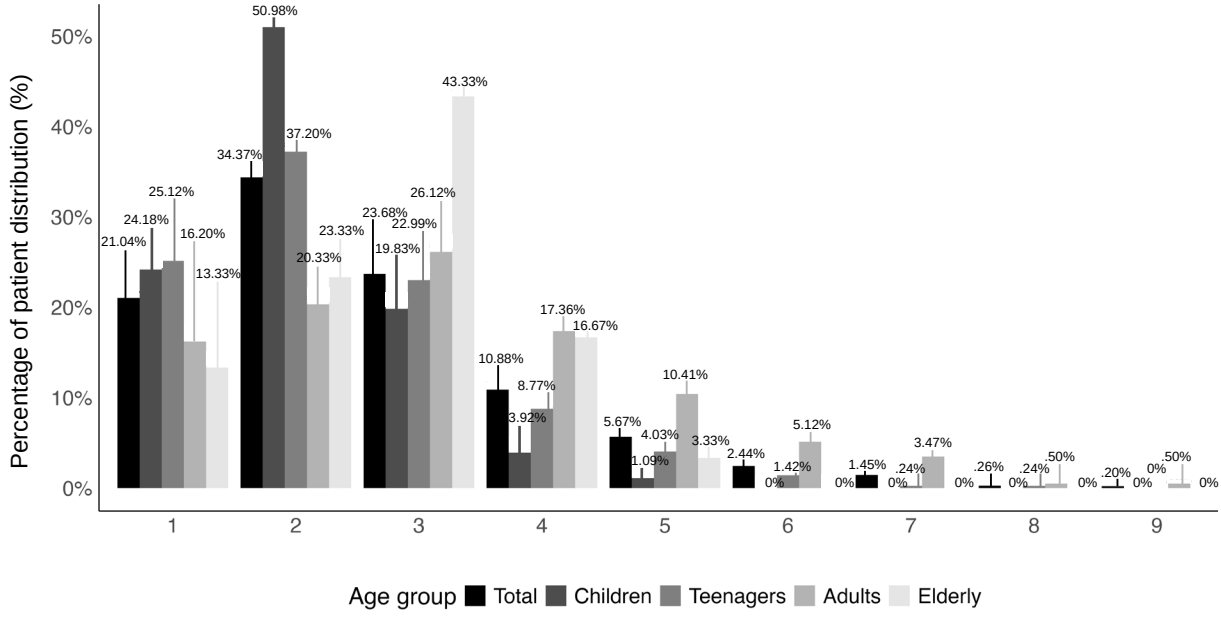

Figure 2. Percentage of number of diagnoses by age group.
Note: The bar chart shows the percentage of diagnoses by age group, as well as the total percentage of patients by number of diagnoses.

Table 2
Population characteristics

Code	*Diagnosis*	*Total (432) n(%)*	*Younger (252) n(%)*	*Adults (175) n(%)*
F 90.0	Attention - deficit / hyperactivity disorder, predominantly inattentive presentation	103 (23.84%)	89 (69.33%)	
F 12.20	Cannabis dependence, uncomplicated	70 (16.2%)	18 (15.93%)	51 (29.14%)
F 15.20	Other stimulant dependence, uncomplicated	69 (15.97%)		57 (32.57%)
F 10.20	Alcohol dependence, uncomplicated	56 (12.96%)		51 (29.14%)
F 34.1	Dysthymi disorder	55 12.73%)		
F 84.0	Autism spectrum disorder	49 (11.34%)	47 (34.14%)	
F 88	Other psychological development disorders	24 (17.27%)		
F 32.1	Major depressive disorder, single episode, moderate	20 (16.71%)		
		Female (139)		
F 34.1	Persistent depresive disorder	23 (16.55%)		
F 90.0	Attention - deficit / hyperactivity disorder, predominantly inattentive presentation	22 (15.83%)	20 (23.53%)	
F 32.1	Major depressive disorder, single episode, moderate	16 (11.51%)		
F 12.20	Cannabis dependence, uncomplicated	15 (10.79%)	5 (5.88%)	10 (19.61%)
F 15.20	Other stimulant dependence, uncomplicated	14 (10.07%)		11 (21.57%)
F 41.1	Generalized anxiety disorder	12 (8.63%)		
F 41.2	Mixed anxiety and depressive disorder	11 (7.91%)		
F84.0	Autism spectrum disorder	9 (6.47%)	9 (10.59%)	
F 60.7	Dependent personality disorder	9 (6.47%)		
F 88	Other psychological development disorders		9 (10.59%)	
F 32.1	Major depressive disorder, single episode, moderate		11 (12.94%)	
F 10.20	Alcohol dependence, uncomplicated			5 (9.8%)

Table 2
Population characteristics (continue)

Code	*Diagnosis*	*Total (432) n(%)*	*Younger (252) n(%)*	*Adults (175) n(%)*
		Male (293)		
F 90.0	Attention - deficit / hyperactivity disorder, predominantly inattentive presentation	81 (27.65%)	69 (41.32%)	
F 12.20	Cannabis dependence, uncomplicated	55 (18.77%)	13 (7.78%)	41 (33.06%)
F 15.20	Other stimulant dependence, uncomplicated	55 (18.77%)		46 (37.1%)
F 10.20	Alcohol dependence, uncomplicated	50 (17.06%)		46 (37.1%)
F84.0	Autism spectrum disorder	40 (13.65%)	38 (22.75%)	
F 88	Other psychological development disorders		18 (10.789%)	
F 32.1	Major depressive disorder, single episode, moderate		11 (12.94%)	

Note: The table shows the main diagnoses of patients in the second database of first-time patients, diagnosed with any of the 87 diagnoses found. The table is divided into the total number of patients, age group, and sex. Four patients with no diagnosis were excluded, yielding a total of 432. Adolescent and child groups were combined as youth, and the elderly group was excluded due to the small number of patients but not from the total.

with 13%, persistent depressive disorder (F34.1), with 12.7%, and autism spectrum disorder (F84.0), with 11.3%.

Among the total of 432 patients, almost a third (139) were female, with the most frequent diagnosis being persistent depressive disorder (F34.1), with 16.5%. Of the 293 male patients, the most frequent diagnosis was ADHD, predominantly the inattentive type (F90.0), with 27.6%. Regarding age, due to the sample size and the Institute's focus on child and adolescent mental health, children and adolescents were grouped together as the youth category. Within this group, the two most common diagnoses were ADHD, predominantly the inattentive type (F90.0), with 69.3%, and autism spectrum disorder (F84.0), with 34.1%. Among adults, the two most common diagnoses were other stimulant dependence without complications (F15.20), with 32.6% and cannabis dependence without complications (F12.20), with 29.1%. The elderly adult group consisted of just five patients, making this dataset insufficient for statistically significant inferential analysis.

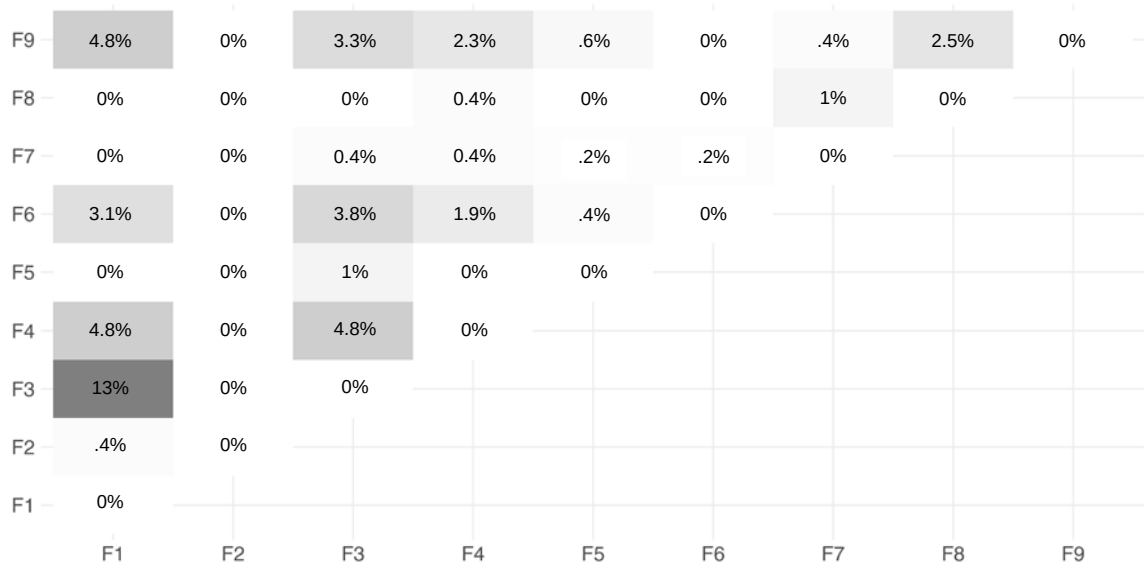

Figure 3. List of Diagnostic Groups.
Note: The chart represents the percentage of times diagnostic groups appear in the same patient. The diagnoses were grouped by tens, with F1 representing mental and behavioral substance use disorders , F2 schizophrenia, schizotypal disorder, and delusional disorders, F3 bipolar disorder and related disorders, and depressive disorders, F4 anxiety disorders, dissociative disorders, stress-related disorders, somatoform disorders, and other non-psychotic mental disorders, F5 behavioral disorders associated with physiological dysfunctions and somatic factors, F6 personality and adult behavioral disorders, F7 intellectual disabilities, F8 developmental disorders, and F9 behavioral and emotional disorders which typically manifest in childhood and adolescence.

DISCUSSION AND CONCLUSION

Age constitutes an important factor in both databases. The results suggest that the younger population, comprising children and adolescents, accounts for 58.2% of the total population and receives the most attention. The WHO (2021) estimates that one in seven adolescents aged 10 to 19 suffer from some mental disorder. A large-scale epidemiological meta-analysis indicates that the first mental disorder appears around age 14 in a third, in nearly half [48.4%] by age 18, and in half the population before age 25, with an average age of onset between 14.5 and 18 years (Solmi et al., 2021). These findings align with this research, where more than half the population treated at the Temazcalli Institute are 20 years old or younger.

The results show a predominance of males in both databases: 64.1% (975 out of 1520) in the outpatient medical records database and 67.9% (293 out of 432) patients in the first-time diagnoses database. Is this consistent with findings from other studies? The literature shows that some research supports this trend, with other studies suggesting different patterns. According to Wu et al. (2023), the incidence of mental disorders has increased in recent decades, with a higher prevalence of men than women. In a National Survey conducted in 2001, although the sample interviewed was predominantly female, with 54%, men generally had higher overall prevalences of any disorder compared to women [30.4% and 27.1%, respectively] (Medina-Mora et al., 2003). However, in a study conducted on adolescents (aged 12 to 17) in 2009, it was observed that girls have a higher number of mental disorders and a higher prevalence of any mental disorder (Benjet et al., 2009). Likewise, in a comparative study between 2019 and 2021 in Mexico, the same pattern was observed, with women having a higher incidence and prevalence of mental disorders (Medina-Mora et al., 2024).

This disparity may be because, unlike our sample, respondents were outpatients at treatment institutions. This perhaps suggests that, in San Luis Potosí, men are more likely to seek treatment or receive diagnosis, which could be partly due to the reduced stigma associated with mental illness in recent years. Conversely, research conducted by Águila-Morales and Clua-García (2024) at an outpatient treatment center for drug users identified barriers to access for women, such as stigmatization, lack of support, and lack of care tailored to women's needs. As a specialized addiction treatment institution, the Temazcalli Institute may well reflect a similar pattern. Further research is required to understand the underlying reasons for these differences.

Despite the pattern observed in sex and age distribution in this study, the elderly population showed the opposite results, with 67% being women. This phenomenon can be attributed to several factors, one being the higher prevalence of elderly women in Mexico (Collazos Marín et al., 2023). In San Luis Potosí, life expectancy is approximately 72 years for men and 78 for women (National Institute of Statistics, Geography and Informatics [INEGI], 2024). Other influencing factors likely include the stigma associated with health problems in older generations and the Institute's specialization in treating addictions, particularly alcohol and tobacco, social acceptance of which has changed over time.

Another interesting finding was the number of diagnoses per patient. Using the Spearman's rank coefficient, we observed a correlation between the number of diagnoses per patient and age. It was found that the number of diagnoses increased with age, peaking in adulthood and declining in old age, as in the study conducted by Wu et al. (2023). We consider that this increased number of diagnoses in adults is likely due to underdiagnosis. In other words, despite existing since childhood, some of these disorders are not diagnosed until adulthood. Another example could be the range of experiences we have while growing up, as with substance use. In addition, disorder onset periods vary widely, with some disorders tending to develop at an early age, and others extending into adulthood (Medina-Mora et al., 2003). In short, age does not necessarily result in the emergence of additional disorders.

In the second database, shown in Table 2, the most frequent diagnosis was F90.0 [23.8%] or Attention-Deficit/Hyperactivity Disorder (ADHD), predominating in men [27.6%] and the second most common disorder in women [15.8%]. Moreover, it was the most prevalent diagnosis among the younger category of patients [69.3%]. According to the DSM-5, ADHD can present in three forms: combined, predominantly inattentive, and predominantly hyperactive/impulsive. This disorder begins in childhood and requires that several symptoms be present before the age of 12 and persist for at least six months. ADHD is more common in males, with a ratio of approximately 2:1 in children and 1.6:1 in adults, with females being significantly more likely to present with inattentive ADHD (American Psychiatric Association [APA], 2014). In 2021, this disorder affected 3.1% of adolescents aged 10 to 14 years and 2.4% of those aged 15 to 19 years worldwide (WHO, 2021). We assume the predominance of this diagnosis is because it is the disorder currently attracting the most attention, probably because health systems and diagnostic tools have evolved to identify it. It could also reflect an increase in cases for unknown reasons that may be worth exploring.

Among adults, the most common diagnoses were related to addictions, consistent with the primary mission of the Temazcalli Institute, which focuses on treating patients with drug dependence. The most commonly abused substances were cannabis, stimulants (amphetamines and methamphetamines), and alcohol, in that order. In 2022, cannabis remained the most commonly used drug globally, with an estimated 228 million users, followed by opioids (60 million), stimulants (30 million), cocaine (23 million), and

ecstasy (20 million) (United Nations Office on Drugs and Crime [UNODC], 2024). According to the National Commission against Addictions in Mexico, the use of psychoactive substances increased by 26% between 2010 and 2020, with 284,000 adults reporting having used a substance in 2020, mostly men. Cannabis and amphetamine use also experienced a significant increase (National Commission against Addictions, 2022). Regarding substance abuse, men represented the majority, both overall and in terms of age distribution. This may also explain why there is a higher proportion of male users at the Temazcalli Institute, since, as mentioned above, it specializes in addictions.

In Table 2, the female population showed a higher incidence of depression diagnoses, with the most frequent diagnosis among women being persistent depressive disorder [16.5(%)]. According to the World Health Organization, depression and anxiety are 50 times more common in women than in men, since men are more likely to present with some form of substance abuse (Kestel et al., 2022).

The second most common diagnosis in children was autism spectrum disorder (F84.0). This neurological disorder is one of the most common among children and young adults, affecting one in 200 children under five years of age (Kestel et al., 2022). Autism spectrum disorder is generally considered hereditary and heterogeneous, with underlying cognitive characteristics and frequent comorbidity with other conditions. Epidemiologically, it is more common in males than females, with a ratio ranging from 2:1 to 5:1 (Lord et al., 2020). Globally, it is estimated that one in 100 children has autism, although prevalence varies across studies, with some reporting significantly higher figures (WHO, 2023). Although there are no official statistics on the incidence of autism, it is estimated that approximately 6,200 people are born with this disorder in Mexico every year. According to Carol Ajax, founder of the Spectrum Therapy Center in Mexico, one in 115-120 people in Mexico has some form of autism spectrum disorder (National Council for the Development and Inclusion of People with Disabilities, 2019).

Given that the Institute addresses dual pathology, involving the presence of both an addiction and a mental disorder, we expected a higher correlation between mental disorders from groups F2 to F9 and diagnoses from group F1. However, the relationship found between these diagnoses was minimal, even when compared by groups. The combinations showing the greatest tendency to correlate were F1 and F3, albeit with a low percentage, followed by F1 and F4, and finally F1 and F9. Since there was a high incidence of diagnoses from group F9, particularly F90.0, a higher correlation with F1 was expected, but instead a greater association was identified with bipolar and depressive diagnoses. Several studies indicate that depression and addictions have high comorbidity, with people with addictions being at a greater risk of developing depression and vice versa (Xu et al., 2020). It is estimated that a person with a substance use disorder has a 32% likelihood of developing major depressive disorder, with evidence suggesting that simultaneous treatment achieves the best outcome for these conditions (Carey, 2018).

The results of this study cannot be extrapolated to the general Mexican population or even to the population of San Luis Potosí, mainly because the sample was drawn from a single specialized institution, limiting its external validity. Despite its limitations (such as sample representativeness), the study's generational, gender, and diagnostic diversity, supported by its substantial sample size, offer critical data on public mental health service utilization and prevalent disorders. Several studies in Mexico, such as national surveys, and global reports, document the state of mental health in the country, from its epidemiology to the follow-up provided for specific disorders. Nevertheless, when conducting this study, we realized the lack of specific analyses of specialized care centers, with the few existing ones having been conducted outside Mexico. Our study is the first attempt to undertake a retrospective, cross-sectional, descriptive analysis to examine the interrelationships among the variables under consideration. These include topics that have hitherto remained unexplored or unverified, specifically, the correlation between age and the number of diagnoses per individual, as well as the relationship among these diagnoses.

The results underscore the importance of prevention and treatment of mental disorders in the state of San Luis Potosí. Accurate statistical data on mental health cases will shed light on the trends observed at the institute that can inform evidence-based clinical protocols and public health policies. It is essential to promote education for both the general public and primary care physicians for the early detection of these disorders, and to increase funding for specialized centers. This study highlights the importance of conducting similar studies at other institutions as well as comparative studies of the latter to obtain more extensive information we could extrapolate. This will encourage researchers to establish accurate incidence rates and population indicators both nationally and regionally. A data-driven approach will improve mental health outcomes and strengthen the healthcare system in San Luis Potosí and Mexico, in addition to making government institutions aware of this public health problem.

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Conflict of interest

The authors declare that they have no conflicts of interest.

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In memoriam
Dr. Francisco Gómez-Mont Ávalos-Levy (1947-2026)

Como Director-Editor de las revistas SALUD MENTAL y MENTE Y CULTURA del Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, me corresponde la dolorosa responsabilidad de evocar la distinguida figura de quien fue un valioso pilar en la fundación y desarrollo de ambas publicaciones. Un amigo entrañable, un sabio y un erudito, una inteligencia privilegiada.

Miembro de una conocida familia mexicana que ha ocupado puestos importantes en la esfera pública, su padre, del mismo nombre, fue un notable endocrinólogo del Hospital de Enfermedades de la Nutrición, futuro Instituto Nacional de Ciencias Médicas y de la Nutrición Salvador Zubirán. En su apellido materno se incluye el de Levy, uno de los más prestigiosos de la tradición hebrea. Su familia materna, muy católica, se enorgullecía de haber tenido un abuelo rabino de ese apellido.

El doctor Gómez-Mont realizó sus estudios profesionales en la Facultad de Medicina de la UNAM y su residencia en psiquiatría en el Hospital Español, en el Servicio de Psiquiatría cuyo titular era el doctor Ramón de la Fuente Muñiz, amigo de su padre, y quien muy pronto se dio cuenta del valor de tan distinguido alumno, al que brindó un decidido apoyo a lo largo de su vida. Francisco fue su colaborador en el Centro Mexicano de Estudios en Farmacodependencia y en el Centro Mexicano de Estudios en Salud Mental, antecedentes del Instituto Mexicano de Psiquiatría, actual Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, en la Unidad de Informática.

Lo conocí a principios de los años setenta cuando acompañaba a la hoy muy famosa doctora Nora Volkow, entonces alumna de pregrado, a la clase de Psiquiatría que dictaba el doctor Dionisio Nieto Gómez, de quien yo era adjunto, en el Instituto Nacional de Neurología y Neurocirugía. Ambos fueron un invaluable apoyo al inicio de la revista SALUD MENTAL a la que enriquecieron con sus reseñas bibliográficas y de los congresos internacionales a los que desde entonces asistían. En ese curso de pregrado asistieron, en sabia elección, estimulados por la fama de Don Dionisio Nieto, alumnos esclarecidos que ocuparían después puestos muy importantes dentro de la medicina mexicana. Volkow y Gómez-Mont fueron, así, compañeros de Jaime Sepúlveda y de Erik Klamroth, el primero de mis discípulos que falleció en la juventud, en Sudáfrica, adonde había ido becado para estudiar antropología física. Ahí nació una hermosa amistad en la que pronto admiré sus cualidades intelectuales y personales. Un día le aconsejé en esa época: "-Panchito, nunca te dejes seducir por un puesto burocrático que limite tus ambiciones intelectuales que te llevarán a explorar nuevos territorios del espíritu." Francisco me hizo caso. Con una recomendación mía, ambos fueron recibidos en París por el profesor Pierre Pichot, titular entonces de la Cátedra de Enfermedades Mentales y del Encéfalo de la Universidad de París, en el Centro Psiquiátrico Sainte-Anne. En una carta mi profesor auguraba un brillante futuro para ambos.

El doctor Gómez-Mont realizó posteriormente varias estancias académicas en prestigiadas instituciones de la Unión Americana (Texas, Pennsylvania y Nueva York) en cuyas bibliotecas científicas y en sus distintos laboratorios adquirió conocimientos de punta en el área de las neurociencias junto a las figuras más relevantes de esas disciplinas en ese país. Como profesor visitante durante cinco

años en la Universidad de Nueva York, participó con el grupo pionero en la aplicación de la tomografía por emisión de positrones en el estudio de pacientes psiquiátricos. Posteriormente, y hasta fecha muy reciente, realizó actividades académicas e investigaciones en diferentes instituciones europeas. Fue conferencista, como Profesor Erasmus Mundus de la Unión Europea, en las Universidades de Río de Janeiro, Estambul, Bérgamo, Perpiñán, Barcelona, Valladolid y Lisboa (donde realizó con Joseline Vega investigaciones en el archivo de Fernando Pessoa). Fue Profesor de Periodismo de la Ciencia en la Facultad de Ciencias Políticas y Sociales de la UNAM y Profesor de Lingüística en la Universidad Iberoamericana.

Su interés en la relación entre las neurociencias y las Humanidades, como pionero de la transdisciplinariedad en nuestro país, lo llevaron a fundar el Centro de Investigación en Neurohumanidades, que organizó a lo largo de diez años los Coloquios Anuales a los que el INPRFM otorgó acogida, pues eran, en cierto modo, la materialización de la visión holista del doctor De la Fuente. En marzo de 2026, el último que organizó, el Coloquio estuvo dedicado a recordar el vigésimo aniversario del fallecimiento de su maestro. Mi participación, escrita en colaboración con el doctor Héctor Esquivias, fue leída por éste, por lo que ya no pude tener el placer de saludar a Francisco por última vez. Permanecen, no obstante, muchos recuerdos felices de nuestra amistad. Mi admiración y gratitud hacia él me acompañarán el resto de mi vida.

Héctor Pérez-Rincón García

San Lorenzo Huipulco, verano de 2026

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   - **Nombre completo del autor y de los coautores.** Los autores deberán colocarse en listado; luego, en superíndice, deberá colocarse un número arábigo que indique la institución de adscripción.
   - **Número ORCID de los autores.** Es requisito que cada uno de los autores cuente con su número de identificación ORCID, el cual se puede conseguir en https://orcid.org/register
   - **Adscripción de los autores.** Se debe indicar con números arábigos y en superíndice. Las adscripciones se colocan inmediatamente después de los nombres de los autores (no como notas en pie de página). Es necesario que la adscripción especifique: departamento, área, institución, ciudad y país de cada autor. No es necesario indicar la dirección postal. Las instituciones deben escribirse en su idioma original, sin traducción. Si los autores añaden siglas, éstas deben pertenecer al nombre oficial. No se deben escribir cargos ni grados de los autores (doctor, residente, investigador, etc.).

     Ejemplo:

     Juan José García-Urbina,[1]

     Héctor Valentín Esquivias Zavala[2]

     [1] Dirección de Investigaciones Epidemiológicas y Psicosociales, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Ciudad de México, México.
     [2] Departamento de Publicaciones, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Ciudad de México, México.

- Al final de la primera página, en el apartado ***"Correspondencia"***, se proporcionarán los datos de contacto del autor corresponsal (dirección postal completa, teléfono, correo electrónico). Es con quien Salud Mental se comunicará durante todo el proceso editorial.

  Ejemplo:

  Correspondencia:
  Juan José García-Urbina
  Dirección de Investigaciones Epidemiológicas y Psicosociales, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz.
  Calz. México-Xochimilco 101, San Lorenzo Huipulco, Tlalpan, 14370, Ciudad de México, México.
  Tel: 55 4152-3624
  E-mail: jurb@imp.edu.mx

5. La segunda página debe contener los resúmenes del trabajo presentado en inglés y español. *Extensión máxima: 250 palabras.*
   - ***Artículos originales y Revisiones sistemáticas.*** Los resúmenes deben estar conformados por: Introducción, Objetivo, Método, Resultados y Discusión y conclusión.
   - ***Casos Clínicos.*** Los resúmenes deben estar conformados por: Introducción, Objetivo, Principales hallazgos, Intervenciones y resultados y Discusión y conclusión.
   - ***Palabras clave.*** Al final de cada resumen se incluirá un mínimo de cuatro y un máximo de seis palabras clave, separadas por comas y en minúsculas. Las palabras clave deben ser las mismas en inglés y en español. Éstas suelen emplearse para la indexación de los artículos, por lo cual tres de ellas deben encontrarse en el MeSH (*Medical Subject Headings*) que se puede consultar en: http://www.nlm.nih.gov/mesh/MBrowser.html.
6. A partir de la tercera página comienza el cuerpo del manuscrito, el cual deberá conservar la estructura señalada en el resumen.
   - ***Introducción (o Antecedentes en el caso de las Revisiones narrativas).*** El último párrafo de este apartado debe incluir de forma clara los objetivos del trabajo y, si se cree necesario, las hipótesis.
   - ***Método.*** Es preciso que cuente con las siguientes secciones:
     - Diseño del estudio
     - Participantes/descripción de la muestra
     - Sedes
     - Mediciones
     - Procedimientos
     - Análisis estadísticos
     - Lineamientos éticos.

Nota: En caso de los artículos de revisión y casos clínicos, estas secciones pueden ser modificadas de acuerdo con la guía PRISMA (revisiones sistemáticas o la guía CASE REPORT (casos clínicos).

   - **Resultados.** Se presentarán en una secuencia lógica dentro del texto. Pueden apoyarse con tablas, gráficas y figuras.
   - **Discusión y conclusión.** En esta sección se destacarán los aspectos nuevos e importantes del estudio y las conclusiones que derivan del mismo, así como las posibles implicaciones de sus hallazgos y sus limitaciones.
7. Después del apartado de Discusión y conclusión, es preciso agregar las declaraciones de los autores en el siguiente orden:
   - ***Financiamiento.*** En este apartado se debe declarar si el estudio o la preparación del manuscrito recibió algún tipo de financiamiento, indicando el nombre de la entidad que proporcionó los fondos.

     Ejemplo:

     Este estudio fue financiado en parte por el CONSEJO NACIONAL DE CIENCIA Y TECNOLOGÍA. (No. XXXXXXX).

     Si no se recibió ningún apoyo financiero, los autores deben declararlo también.

     Ejemplo:

     Ninguno.
   - ***Conflicto de intereses.*** En esta sección, los autores deberán declarar si tienen conflictos de intereses relacionados con su actividad científica. Tener un conflicto de interés no supone necesariamente un impedimento para la publicación del manuscrito. Si no existe conflicto de interés se debe insertar la siguiente frase: *"Los autores declaran no tener algún conflicto de intereses"*.
   - ***Agradecimientos.*** Cuando se considere necesario, se mencionarán después de las declaraciones anteriores los agradecimientos a personas, centros o entidades que hayan colaborado o apoyado en la investigación.
8. **Referencias.** Las referencias se colocan después de las declaraciones del autor (Financiamiento, Conflicto de intereses y Agradecimientos), y ***deben seguir exclusivamente las normas de publicación de la American Psychological Association (APA), en su última edición*** (https://normas-apa.org).
9. **Tablas y figuras.** Salud Mental establece un máximo de cinco elementos gráficos en total. ***El estándar solicitado para la elaboración de tablas y figuras es el de la American Psychological Association (APA), última edición*** (https://normas-apa.org)***.*** Éstas se colocarán al finaldel manuscrito después de las referencias:
   - Las tablas deben contener título y, en la parte inferior, una nota con el desglose de las siglas.
   - Las figuras deben enviarse en un formato de alta resolución (mínimo 300 dpi).
   - Los títulos de las tablas y los pies de las figuras deben ser claros, breves y llevar siempre el número correspondiente que los identifique. Dentro del texto, el autor debe indicar entre paréntesis y con mayúsculas en qué parte del texto sugiere insertar los elementos gráficos.

     Ejemplo:

     Se cambiaron las definiciones de algunos patrones conductuales (Tabla 3) de manera que fueran más comprensibles en el idioma español y se redefinieron las categorías que agrupan dichos patrones con base en la literatura especializada. (INSERTAR AQUÍ TABLA 3)

ARCHIVOS COMPLEMENTARIOS

1. ***Carta de autorización de uso de la obra.*** Debe estar firmada por todos los autores y enviarse en formato PDF que se puede descargar en https://revistasaludmental.gob.mx/public/Carta-autorizacion-para-publicacion.pdf.
2. ***Carta de presentación.*** El autor debe exponer las fortalezas de su aportación científica, resaltando el alcance, la originalidad y la importancia de su contribución

al campo de la salud mental. *Es de carácter obligatorio mencionar a tres revisores nacionales o internacionales en el campo de conocimiento del manuscrito sometido, favor de indicar el nombre completo y correo electrónico de cada uno de los revisores.* Debe cargarse en formato PDF.

ÉNFASIS Y PUNTUACIÓN

1. Es importante que los manuscritos eviten en general las notas a pie de página, aunque se pueden considerar si son claramente necesarias.
2. Las cursivas deben utilizarse para:
   - Destacar palabras extranjeras.
   - Enfatizar expresiones populares.
   - Mencionar títulos de libros, documentos ya publicados y publicaciones periódicas.
3. Las cursivas pueden emplearse para:
   - Resaltar términos significativos o importantes cuando se mencionan por primera vez.
   - Destacar una palabra u oración dentro de una cita.
4. Las comillas dobles deben usarse solamente para:
   - Citar párrafos de otros autores dentro del texto.
   - Citar textualmente fragmentos del discurso de los sujetos de estudio.
5. Evite el uso de paréntesis doble, es decir, un paréntesis dentro de otro. En su lugar utilice corchetes.
6. Puede emplearse guiones largos para indicar oraciones parentéticas.
7. Deben utilizarse de forma correcta todos los signos de puntuación. Por ejemplo, si emplea signos de interrogación en un texto en español, deben colocarse los de apertura y cierre correspondientes; se procede de igual manera con las comillas.

FÓRMULAS MATEMÁTICAS Y ESTADÍSTICAS

Para presentar los resultados se deben considerar las siguientes indicaciones:

1. Escribir con letra las cifras de cero a nueve y con números las cifras de 10 en adelante.
2. Utilizar números cuando se trate de fechas, muestras, etcétera.
3. Incluir en los datos estadísticos los intervalos de confianza.
4. Los símbolos estadísticos se escriben en cursivas (por ejemplo, *M, SD, n, p)*.
5. Expresar la probabilidad exacta con dos o tres decimales (por ejemplo, $p = .04$; $p = .002$) sin el cero adelante del punto decimal. En caso de ser menor a .001 indicarlo con un < .001.
6. Dejar un espacio antes y después de cada signo (a + b = c en lugar de a+b=c).
7. Emplear puntos en lugar de comas para indicar decimales.

VERIFIQUE LO SIGUIENTE ANTES DE SOMETER SU MANUSCRITO

Antes de enviar su manuscrito, cerciórese de adjuntar la documentación solicitada. A los autores, se les devolverá aquellos envíos que no cumplan con los lineamientos editoriales.

1. Manuscrito en formato en WORD.
2. Carta de presentación en formato PDF.
3. Carta de autorización de uso de obra en formato PDF.

GUIDELINES FOR AUTHORS

Salud Mental publishes original articles on psychiatry, psychology, neurosciences and other related fields in the following formats:

1. **Editorials**
   Written at invitation of the Director Editor, editorials express authoritative opinions on specific topics of interest to the scientific community and the area of mental health. They are designed to foster debate and promote new lines of research. *Maximum extension: 1000 words*.

2. **Original articles (peer-reviewed section)**
   These articles present research results unpublished in other journals, and can be written using the following methodologies:
   - *Quantitative methodology.* This methodology includes primary and secondary results from cross-sectional studies, clinical trials, cases and controls, cohorts, and quasi-experimental studies. *Maximum extension: 3500 words*.

     Depending on the type of study, manuscripts should adhere to the following guidelines:
     - Randomized clinical trials should adhere to the *CONSORT guidelines* (http://www.consort-statement.org).
     - Studies with non-experimental designs should adhere to the *TREND guidelines* (https://stacks.cdc.gov/view/cdc/149677).
     - Cross-sectional, cohort, and case-control studies should adhere to the *STROBE guidelines* (http://www.strobe-statement.org).
   - *Qualitative methodology.* This methodology includes focus group reports, in-depth interviews, semantic networks, and content analysis. *Maximum extension: 5000 words*.

     Articles using this type of methodology should comply with the *COREQ guidelines* (https://doi.org/10.1093/intqhc/mzm042).

3. **Review articles (peer-reviewed section)**
   - **Systematic reviews.** These reviews should preferably include a meta-analysis. *Maximum extension: 4000 words*.

4. **Case reports**
   They include reports on the effects of a diagnostic or therapeutic method that is useful or relevant in the medical, academic, or scientific field. *Maximum length: 2000 words.*
   These should comply with the *CASE REPORT guidelines* (https://www.care-statement.org/checklist).

Note. The word count for each of these sections excludes the title, abstracts, and keywords, as well as the funding, conflicts of interest and acknowledgments sections. Words included in tables, figures and references are not considered either.

LANGUAGES

Salud Mental receives and publishes only manuscripts in English.

ETHICAL ASPECTS IN PUBLISHING

See Ethical Guidelines for the journal at https://revistasaludmental.gob.mx/index.php/salud_mental/ethicalguidelines

AUTHORSHIP

The number of authors will depend on the type of manuscript submitted. The maximum number of authors for original or review articles is eight. Only in the case of multicenter studies will the maximum number of authors be increased to twelve, provided this is justified by the scope of the study.

In the event of collective authorship, the name of the editors or those responsible for the article will be included followed by “and the group...” when all members of the group consider themselves co-authors of the work. If the name of the group is to be included, even if not all its members are considered co-authors, the authors responsible will be mentioned followed by “on behalf of the ...group or “by the...group.” In any case, the names and institutions to which members of the group are affiliated should be included in an appendix at the end of the manuscript.

EDITORIAL GUIDELINES

It is of the utmost importance for authors to consider the following before sending their manuscript:

1. Manuscripts should be written clearly and concisely, with no spelling or grammatical errors.
2. The text should be written in Word format, Times New Roman font, size 12, with double-spacing and 2.5 cm margins on letter size sheets.
3. Pages should be numbered consecutively, beginning with the title page, with the number written in the upper right corner.
4. The first page (showing the title) should contain the following sections in the order mentioned here:
   - *Title of article in Spanish and English*. The title should be descriptive and indicate the main results of the study. *Maximum extension: 25 words.*
   - *Short title in Spanish and English*. *Maximum extension: 6 words.*
   - *Full name of author and co-authors*. The authors must be listed and then an Arabic number must be placed in superscript, indicating the institution to which they are affiliated.
   - *Author ORCID number.* It is a requirement that all authors have their ORCID identification number, which can be obtained at https://orcid.org/register
   - *Author affiliation*. This should be indicated with Arabic numerals and in superscript. Affiliations should be placed immediately after authors’ names (not as footnotes). Affiliations should specify the department, area, institution, city, and country of each author. It is not necessary to indicate the postal address. Institutions must be written in their original language, without translation. If the authors add acronyms, these must be included in the official name. No positions or degrees of the authors (such as doctor, resident, or researcher) should be written.

. For example:

Juan José García-Urbina,[1] Héctor Valentín Esquivias Zavala[2]

[1] Dirección de Investigaciones Epidemiológicas y Psicosociales, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Ciudad de México, México.
[2] Departamento de Publicaciones, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Ciudad de México, México.

- The **"Correspondence"** section should be placed at the end of the first page, indicating the corresponding author with their postal address, phone and email address. This will be the only author Salud Mental will contact during the process.

  For example:

  Correspondence:
  Juan José García-Urbina
  Dirección de Investigaciones Epidemiológicas y Psicosociales, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz.
  Calz. México-Xochimilco 101, San Lorenzo Huipulco, Tlalpan, 14370, Ciudad de México, México.
  Phone: 55 4152-3624
  E-mail: jurb@imp.edu.mx

5. The second page should contain abstracts of the article in English and Spanish. Each abstract should contain a maximum of 250 words.
   - **Abstracts of original articles and systematic reviews** should comprise the following: Introduction, Objective, Method, Results, and Discussion and Conclusion.
   - **Abstracts of Clinical Cases** should comprise Introduction, Objective, Main findings, Interventions, Results, and Discussion and Conclusion.
   - **Keywords.** At the end of each abstract, a minimum of four and a maximum of six keywords should be included, separated by commas and in lower case. Keywords must be the same in English and Spanish. These are used for indexing articles, which is why three of them must be found in the *MeSH (Medical Subject Headings)* (http://www.nlm.nih.gov/mesh/MBrowser.html).
6. The body of the manuscript begins on the third page, which should follow the structure indicated in the abstract:
   - **Introduction (or Background for Narrative Reviews)**. The last paragraph of this section should clearly include the objectives of the review and, if necessary, the hypotheses.
   - **Method.** This should contain the following sections:
     - Study design
     - Subjects/sample description
     - Sites
     - Measurements
     - Procedure
     - Statistical analysis
     - Ethical considerations
       In the case of review articles and clinical cases, these sections may be modified in keeping with the PRISMA guideline (systematic reviews) or the CASE REPORT guideline (clinical cases).
   - **Results.** These should be presented in a logical sequence within the text. They can be supported with tables, graphs, and figures.
   - **Discussion and Conclusion**. This section will highlight new and relevant aspects of the study and the conclusions derived from it, as well as the possible implications of its findings and its limitations.
7. After the Discussion and Conclusion section, author statements should be added in the following order:
   - **Funding**. In this section, authors should declare whether the study or the preparation of the manuscript received any type of funding, indicating the name of the entity that provided the funds.

     For example:

     This study was partially funded by CONSEJO NACIONAL DE CIENCIA Y TECNOLOGÍA (No. XXXXXXX).

     If no financial support was received, authors must state it was well.

     For example:

     None.
   - **Conflict of interest.** In this section, authors must declare whether they have conflicts of interest related to their scientific activity. Having a conflict of interest will not necessarily prevent publication of the manuscript. If there is no conflict of interest, the following phrase must be inserted: "The authors declare that they have no conflicts of interest."
   - **Acknowledgments**. If deemed necessary, acknowledgment of the people, centers or entities that have collaborated or supported the research will be mentioned after the previous statements.
8. **References.** Are placed after the authors' declarations (Funding, Conflicts of interest, and Acknowledgements), and must adhere to the ***Publication Guidelines of the American Psychological Association (APA), last edition*** (https://normas-apa.org).
9. **Tables and figures.** *Salud Mental* establishes a maximum total of five graphic elements. The standard requested for tables and figures adheres to the ***Guidelines of the American Psychological Association (APA), last edition*** (https://normas-apa.org). These will be placed in the same document as the manuscript after the references.
   - Tables must contain a title and a note with an explanation of the acronyms used at the bottom.
   - Figures must be submitted in a high resolution format (minimum image size 300 dpi).
   - Titles of the tables and figure captions must be clear, brief, and always have an identifying number. Within the text, the author must indicate in parentheses and capital letters where the graphic elements should be inserted.

     For example:

     The definition of some behavioral patterns was changed (Table 3) so that they were more comprehensible in Spanish and the categories that group such patterns were redefined based on specialized literature. (INSERT TABLE 3 HERE)

COMPLEMENTARY FILES

1. **Authorization letter for Publication**. This should be signed by all the authors and submitted in PDF format. Download the form at https://revistasaludmental.gob.mx/public/Authorization-letter-for-publication.pdf.
2. **Cover letter**. The author should describe the strengths of their scientific contribution, highlighting the scope, originality, and importance of their contribution to the field of mental health. *It is mandatory to mention three national or international reviewers in the field of knowledge of the submitted manuscript, please indicate the full name and email address of each of the reviewers.* This must be uploaded in PDF.

EMPHASIS AND PUNCTUATION

1. Manuscripts should generally avoid footnotes, although they may be considered if essential.
2. Italics should be used to:
   - Highlight foreign words
   - Emphasize popular expressions
   - Mention titles of books, published documents and periodicals
3. Italics can be used to:
   - Highlight significant or important terms when they are first mentioned
   - Highlight a word or sentence within a quote
4. Double quotes should only be used for:
   - Citing paragraphs from other authors within the text
   - Quoting verbatim fragments of the study subjects' words
5. Avoid using double parentheses, in other words, one parenthesis inside another, and use square brackets instead.
6. Long dashes can be used to indicate parenthetical sentences.
7. All punctuation marks must be used correctly. For example, if question marks are used in a Spanish text, the corresponding opening and closing signs must be included together with quotation marks.

MATHEMATICAL AND STATISTICAL FORMULAE

The following points must be considered when results are presented:

1. Write figures from zero to nine in letters and use numbers for figures from 10 onwards.
2. Use numbers with dates and samples, etc.
3. Include confidence intervals in statistical data.
4. Statistical symbols are written in italics (M, SD).
5. Express exact probability to two or three decimal places (for example, $p = 0.04$; $p = 0.002$), *with no zero in front of the decimal point.* If it is less than .001, it should be written as follows < 0.001.
6. Leave a space before and after each sign (a + b = c instead of a+b=c).
7. Use periods instead of commas to indicate decimals.

PLEASE CHECK THE FOLLOWING BEFORE SUBMITTING YOUR MANUSCRIPT

Before submitting your manuscript, be sure to attach the requested documentation. Submissions failing to comply with the editorial guidelines will be returned to authors.

1. Manuscript in WORD format
2. Cover letter in PDF format
3. Letter authorizing the use of the article