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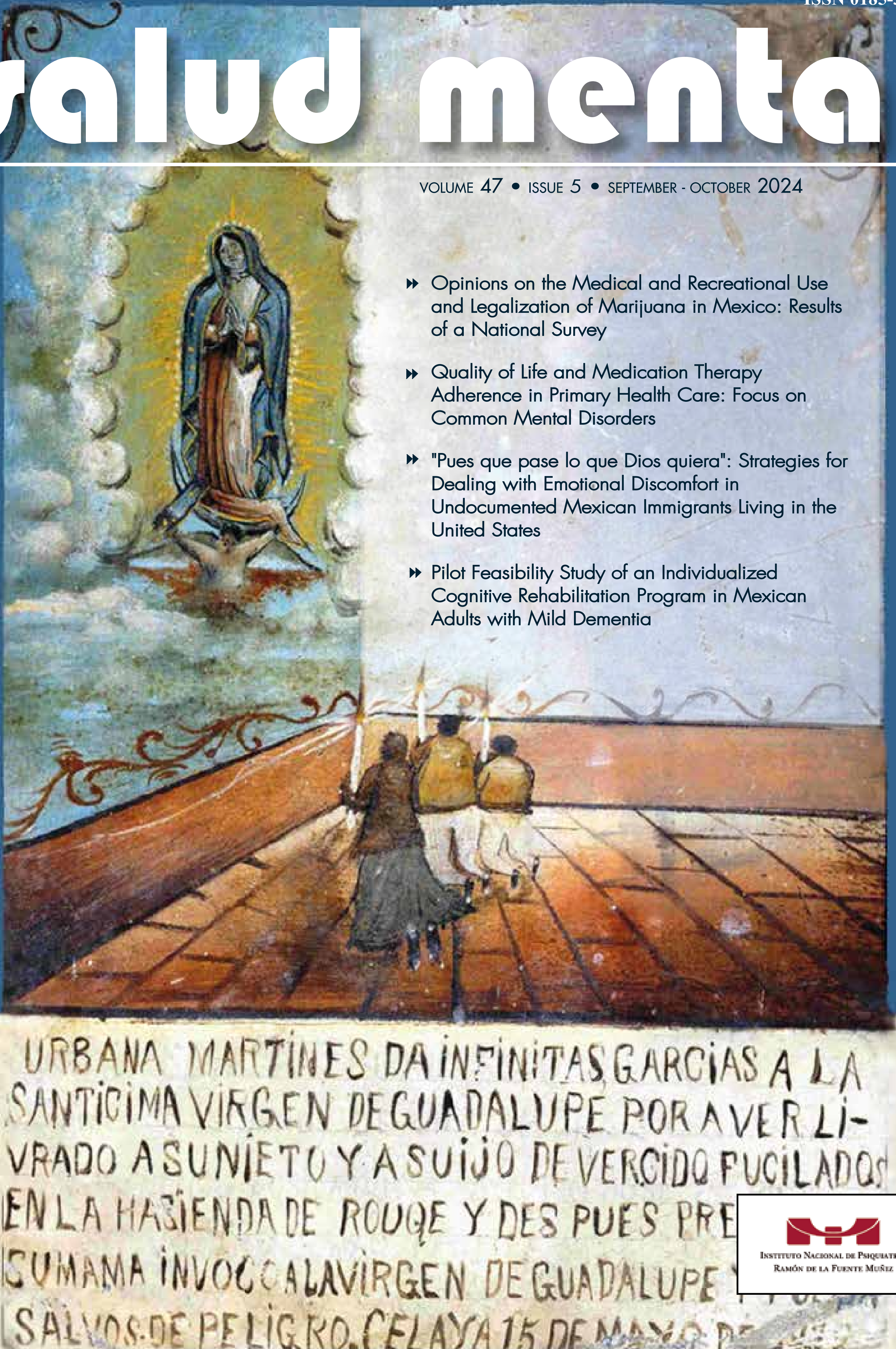

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Volume 47 Issue 5 September-October 2024

CONTENT

EDITORIAL

ORIGINAL ARTICLES

On the cover
Ex-voto
to our Lady of Guadalupe,
Mexico, XX Century

INSTITUTO NACIONAL DE PSIQUIATRÍA
RAMÓN DE LA FUENTE MUÑIZ

Directorio

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EDITORIAL
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Fentanyl and xylazine on the Northern Border of Mexico: A New Challenge for Drug Health Policy

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The epicenter of fentanyl use in Mexico has been in Tijuana and Mexicali, two cities on the U.S. border characterized by drug use (Rafful et al., 2015; Goodman-Meza et al., 2022). In recent years, these cities have seen the largest seizures of fentanyl in the country (Comisión Nacional de Salud Mental y Adicciones, 2024a) as well as the exponential growth of its use and that of other adulterants such as xylazine.

Fentanyl is a much more potent synthetic opioid agonist than morphine and heroin, used for pain management in medical settings. Its illegal production in clandestine laboratories in liquid, pill or powder form has created a major opioid crisis in the United States, causing over 80,000 overdose deaths in 2023 (National Center for Health Statistics, 2023).

Xylazine is a non-opioid analgesic and sedative approved for veterinary use only. People exposed to this substance can develop skin abscesses and physiological dependence, present with symptoms compatible with a substance use disorder and experience severe withdrawal symptoms (such as irritability, anxiety, and dysphoria) after its abrupt discontinuation (Gupta et al., 2023). Its use has been detected in the United States, Puerto Rico, and the United Kingdom, with Mexico recently joining the list (Comisión Nacional de Salud Mental y Adicciones, 2024b).

The combination of the two substances has been recognized as a serious threat to human health and health alerts have been issued in the countries affected, together with recommendations to adjust medical treatments, implement harm reduction strategies and address health emergencies resulting from overdoses (Zhu et al., 2023).

In Mexico, the consequences of the modification of the drug supply, which has shifted from the use of heroin to fentanyl with xylazine, have been devastating for the most vulnerable communities on the northern border, Persons Who Inject Drugs (PWID), among whom overdose mortality has the greatest impact (Friedman et al., 2022).

In recent years, the Ramón de la Fuente Muñiz National Institute of Psychiatry (INPRFM), together with the Prevencasa, Programa Compañeros and Verter NGOs, the National Autonomous University of Mexico, the Tijuana Institute of Technology, the Center for Research and Advanced Studies and the Autonomous University of Baja California have monitored changes in the drug market, health consequences and the lived experience of people in Tijuana, San Luis Río Colorado, Mexicali and Ciudad Juárez:

- 2018. PWID mainly used black tar heroin, known as *chiva* in Mexican Spanish, without knowing it was heroin. They felt that the effects of white powder heroin, known as *china white*, were stronger. They got hooked more quickly[1] and experienced more overdoses. The main method for reversing an overdose was injecting salt and water. Only 1.6% had used naloxone[2] out of 600 people interviewed at rehab centers, where 2.7% had HIV and 80% HCV[3] (Fleiz-Bautista et al., 2019).
- 2020. For the first time, we found heroin adulterated with fentanyl through the technique known as drug checking. Using immunoassay test strips to analyze the contents of eighty samples of white powder heroin residue in used syringes, we

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[1] Term used by PWID to refer to a person who has been drug dependent or a heavy user for a long time.
[2] Naloxone is a medicine that reverses opioid overdoses.
[3] Project funded by the U.S. Department of State and the Ramón de la Fuente Muñiz National Institute of Psychiatry.

found that 93% of all the white powder samples contained fentanyl and that the population was being exposed to opioids without realizing it and without access to naloxone (Fleiz et al., 2020).

- 2023. For the first time, we detected the presence of xylazine in 20% of the 300 samples of heroin and fentanyl analyzed using mass spectroscopy. This same year we also found a rapid increase in fentanyl use, seven out of ten samples contained this opioid, polydrug use with methamphetamines, coupled with overdoses, which the population unsuccessfully tried to reverse with water and salt, and an increase in the HIV index from 4.5% to 11% among PWID who used fentanyl and/or methamphetamines and the development of skin abscesses that were more difficult to cure.[4]

These results revealed a complex, challenging reality: fentanyl consumption spread rapidly along the northern border, like no other adulterant or psychoactive substance ever recorded in Mexico and showed how xylazine contributed to this health crisis shared with the United States.

Several factors have played a crucial role in this growing trend: a porous border, the high availability on the streets of the combination of these two substances, the low cost of a dose (less than two dollars), the enhanced effects of well-being and relaxation that the population quickly identified, the social inequality that encourages these substances to reach the most vulnerable people, thereby exacerbating disparities in health, housing, food and education, stigma (Volkow, 2020) and social pain associated with the "psychological distancing from other people or social groups," processed in parts of the brain that handle negative emotional components and physical pain (Zhang et al., 2019), increasing the need to use substances.

The presence and production of fentanyl in Mexico has been a topic of intense debate that has focused on the substance rather than the people and context. The scientific evidence is overwhelming: fentanyl and xylazine, as well as their health consequences, are a worrying reality in a country that has created more unresolved controversies than actions, such as the failed attempts to declassify naloxone in the General Health Law, the uninterrupted support for harm reduction programs, the limited availability of drug-assisted therapies such as methadone that was temporarily unavailable, and the emotional pain of people that went unheard.

It is urgently required to address the perceived needs of PWID demanding access to a dignified life, which could represent a hopeful sign for the reconstruction of peace processes in a region affected by insecurity, violence, and for people's suffering.

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Opinions on the Medical and Recreational Use and Legalization of Marijuana in Mexico: Results of a National Survey

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ABSTRACT

Introduction. The use of medical marijuana was legalized in Mexico in 2017. In June 2021, the Supreme Court authorized personal marijuana use, as well as its planting, cultivation, harvest, preparation, possession, and transportation for recreational purposes by persons aged 18 and over, decriminalizing its use. **Objectives.** 1) To determine which variables are associated with favorable opinions regarding medical use, recreational use, and the legalization of marijuana use; and 2) to determine whether there are differences in the variables that best predict support for medicinal and recreational use and legalization of marijuana among marijuana users and non-users. **Method.** Data are drawn from the 2016 National Survey on Drug, Alcohol, and Tobacco Use, administered to a nationally representative sample of Mexican households. A validated questionnaire was used with questions on demographic characteristics, marijuana use (including the number of times it has been used), respondents' opinions regarding the legalization of marijuana and recreational use, whether they have been offered marijuana without having to pay for it, perception of risk associated with marijuana use, and excessive alcohol consumption. **Results.** Being male and having a low perception of the risks of marijuana use are the variables mostly strongly associated with approving medical and recreational use and its legalization, irrespective of whether respondents used it. Other variables associated with approval are age, educational attainment, and income level. **Discussion and Conclusion.** Legislators and policy makers should consider the full range of public opinion concerning the use and legalization of marijuana and incorporate it into their proposals.

Keywords: Opinions, marijuana, medicinal, recreational, legalization, users, Mexico.

RESUMEN

Introducción. En México, el uso de la marihuana medicinal fue legalizado en 2017 y en junio de 2021, la Suprema Corte autorizó el uso personal de marihuana, así como su siembra, cultivo, cosecha, preparación, posesión y transporte con fines recreativos para personas mayores de 18 años. **Objetivos.** 1) Conocer las variables que se relacionan con las opiniones favorables hacia el uso médico, recreativo y legalización de la marihuana y 2) determinar si existen diferencias en las variables que mejor predicen el apoyo al uso medicinal, al recreativo y a la legalización de la marihuana entre usuarios y no usuarios de esta sustancia. **Método.** Los datos son de la Encuesta Nacional de Consumo de Drogas, Alcohol y Tabaco 2016; es una muestra nacional representativa de hogares mexicanos. Se utilizó un cuestionario validado que contenía preguntas demográficas, consumo de mariguana y número de veces que se ha consumido, opiniones sobre el uso medicinal, recreativo y legalización de la mariguana. **Resultados.** Ser hombre y tener una baja percepción de riesgo son variables que se asociaron con aprobar cualquier uso y con la legalización de la mariguana, independientemente de si los encuestados la usaban o no. Otras variables asociadas con la aprobación son la edad, el nivel educativo y el nivel de ingresos. **Discusión y conclusión.** Es conveniente que los encargados de planificar y establecer las políticas públicas sean incluyentes y tomen en cuenta las diversas opiniones, de tal manera que retomen, respeten y validen estas posturas ante el uso y la legalización de la mariguana.

Palabras clave: Opiniones, mariguana, medicinal, recreativo, legalización, usuarios, México.

INTRODUCTION

We begin by defining key concepts in the discussion of legal issues related to the use of marijuana: its medicinal and recreational use, decriminalization, depenalization, and legalization:

- *Medical use.* The use of derivatives of the plant to treat certain medical conditions (National Institute of Drug Abuse, 2019).
- *Recreational use.* The use of marijuana for pleasure or recreational purposes (National Institute of Drug Abuse, 2019).
- *Decriminalization.* The elimination of criminal sanctions for the use and possession of marijuana, and for the cultivation or acquisition of drugs for personal use. The objective of decriminalization is to eliminate punishment and stigmatization of those who use marijuana (International Drug Policy Consortium, 2016).
- *Depenalization.* Lessening the severity of sanctions for a crime. Depenalization can involve the reduction of maximum and/or minimum prison sentences or fines for certain crimes related to marijuana use, or the replacement of prison sentences with alternative sanctions in the case of minor offenses (International Drug Policy Consortium, 2016).
- *Legalization.* The process by which all actions associated with drugs (such as use, possession, cultivation, production, and buying/selling,) are made legal. As part of this process, governments may adopt laws and regulatory policy relating to the production, distribution, and use of drugs, limiting their availability and access (International Drug Policy Consortium, 2016).

In 1996, California became the first jurisdiction in the Americas to legalize the medical use of cannabis. It is now legal in 33 other states in the US, and recreational use is legal in 11 (Zuleta et al., 2021). In 2018, Canada legalized recreational use at the federal level (Turna et al., 2022; Yu et al., 2020). In Latin America and the Caribbean, medical use became legal in the 2010s in Argentina, Chile, Peru, Paraguay, Colombia, Puerto Rico, and Jamaica (Labiano, 2021; Schleimer et al., 2019). In Mexico, the use of medical marijuana was legalized in 2017, with the law providing that "products containing cannabis derivatives with THC concentrations of 1% or less that have broad industrial use may be commercialized, exported, and imported, in compliance with the established requirements of the health code. Likewise, the Ministry of Health is authorized to design and implement public policy to regulate the medicinal use of pharmacological derivatives of marijuana (Cámara de Diputados, 2017).

In November 2015, the Mexican Supreme Court declared the system of administrative prohibitions of the recreational use of marijuana unconstitutional. Four more cases were tried between 2015 and 2018, leading to the consolidation of the law. In June 2021, the Supreme Court authorized personal marijuana use, as well as its planting, cultivation, harvest, preparation, possession, and transportation for recreational purposes by persons aged 18 and over, decriminalizing its use (Suprema Corte de Justicia de la Nación, 2021). It is important to note that civil society has been a key actor in marijuana decriminalization and regularization. However, the process of legalization is still underway, since Congress has yet to pass legislation on recreational use that would provide legal assurance to users and third parties and create the necessary conditions for the responsible exercise of this right (Suprema Corte de Justicia de la Nación, 2021).

Public opinion has played an important role in marijuana regulation. In all the US states that have legalized marijuana and approved recreational use, reforms were effected because of citizen initiatives (Chiu et al., 2022). Over the years, popular opinion on the regulation of cannabis has become more relaxed. In this respect, Carliner et al. (2017) find that the Americas may be participating in the phenomenon of normalization of cannabis use, which, according to Pennay and Measham (2016), has become a social process taking place throughout the Western world.

It is worth noting that differences in opinion have been observed depending on whether the issue at stake is medical or recreational use, or the legalization of marijuana. Most data are drawn from opinion studies conducted in the United States and Europe, where the greatest progress has been made in the legalization of this drug. Medical use enjoys higher approval than recreational use. According to research projects and opinion polls undertaken in the United States, over 80% of the population approve of the medical use of marijuana, believing it can be useful in pain relief, managing epilepsy seizures, reducing inflammation, and treating anxiety (Sznitman, & Bretteville-Jensen, 2015). According to authors such as Galston and Dionne Jr (2013), these opinions have gained significant traction, due to the media information people receive daily on the health benefits of marijuana and its derivatives. Analysis of sociodemographic variables shows that the effects of age and sex on these opinions are insignificant, while the effects of income and educational attainment are minimal (Musgrave & Wilcox, 2014; National Poll on Healthy Aging, 2018).

Although support for recreational use is lower, a 2002 CBS News poll (De Pinto, 2022) reported that two-thirds of people in the US agree that recreational marijuana use should be legal at both the federal and local level while 34% would approve of a marijuana business being set up in their neighborhood. This acceptance is four times higher among those who have used marijuana than those who have not.

Sznitman, & Bretteville-Jensen (2015) point out that younger men with college degrees are more likely to approve of recreational use. There is also greater support among people without a religious affiliation (Musgrave & Wilcox, 2014). According to these authors, disapproval among religious people is due, among other things, to the fact that marijuana use is seen as a moral issue, meaning that recreational consumption is considered "wrong." In Australia, the most favorable views for recreational use were found among regular or experimental marijuana users and alcohol users (Chiu et al., 2021).

Most of the literature concerns opinions on the legalization of marijuana. Social groups that have expressed higher levels of support include men, college graduates, and those without a religious affiliation (Felson et al., 2019; Maričić et al., 2013; Schepis et al., 2011). This literature holds that women tend to be more liberal than men about controversial public opinion issues such as the approval of same-sex marriage or the legalization of abortion. However, this does not hold true for the issue of marijuana. Felson et al. (2019) offer the following hypotheses: 1) views on marijuana are associated with the maternal instinct, 2) women use less marijuana, and 3) women have a greater risk perception of marijuana use.

Marital status, parenthood, and religious affiliation also have an influence on attitudes toward legalization, with studies showing that single people are more likely to approve of legalization than married ones, and that parents are more opposed to marijuana use than those without children (Musgrave & Wilcox, 2014). People with a religious affiliation are less likely to support legalization than those without one (Hai, 2018; Krystosek, 2016; Musgrave & Wilcox, 2014).

Self-identifying as a user or non-user also influences opinions on legalization. Based on a survey conducted in the Netherlands, Palali and van Ours (2017) observed that people who have used marijuana are more likely to support legalization. Similar results were described by Trevino and Richard (2002) in a study undertaken in Houston, where 68% of users surveyed supported the legalization of marijuana, as compared with only 33.3% of non-users. These differences between users and non-users were also found by Schnabel and Sevell (2017); Andreas et al. (2021); Cohn et al. (2017); Ellis et al.(2019); Znoj et al. (2022). Another study, conducted on a group of Norwegian students, found that support for legalization was associated with low-risk perception, a history of illicit substance use, and current tobacco and alcohol use (Andreas et al., 2021).

A study of people in Argentina, Uruguay, Chile, Bolivia, Mexico, Peru, Costa Rica, Colombia, and El Salvador found that approval rates for legalization and recreational use of marijuana were higher among those who had tried it than among those who had never used it. In Chile, Colombia, and Mexico, approval was twice as likely among those who had tried marijuana (Mendiburo-Seguel et al., 2017).

In Mexico, legalization of medical use is recent, and the legalization of recreational use is still underway, meaning that their impact on marijuana use and opinions on these changes are yet unknown. Although surveys have been conducted by public opinion firms, only a few have used nationally representative samples that would allow for an analysis of characteristics such as sex, age, income, and risk perception, and their association with support for medical and recreational use, and legalization.

An opinion poll conducted by Consulta Mitofsky (2021) found that 58% of respondents agreed that recreational marijuana use should be allowed. Respondents also believed that the current prohibition does not make it difficult to obtain the drug. A 2013 survey by Parametria found that 85% of Mexicans opposed recreational marijuana use. By 2016, this figure had fallen to 65% and by 2018, only half were against it (Parametria, 2018). Both polling organizations agree that five years ago, a majority opposed accepting recreational use since they thought drug use was the cause of insecurity and violence in Mexico, and believed that if recreational drug use were accepted, there would be more users and therefore more violence. However, insecurity and violence have been disassociated from drugs, since drug cartels are now more identified with extortion and protection racketeering. Mexican respondents are inclined to decriminalize consumers by allowing recreational use of the drug and report greater knowledge of the scope of legalization in other countries. Moreover, one in three knows someone who uses marijuana for recreational purposes.

Based on the literature reviewed, the research question guiding this article is whether there are any differences in the variables related to the approval of medical use and recreational use, and the legalization of marijuana in the Mexican population. The objectives are as follows:

1. To determine which variables are related to favorable opinions toward medical and recreational use, and the legalization of marijuana use in a representative sample of the Mexican population.
2. To determine whether there are differences in the variables that best predict support for medicinal and recreational use, and the legalization of marijuana among marijuana users and non-users.

METHOD

Design of the study

The results described here are drawn from the 2016 National Survey on Drug, Alcohol, and Tobacco Use (Encuesta Nacional de Consumo de Drogas, Alcohol y Tabaco, Spanish acronym ENCODAT), a household survey designed to analyze alcohol, tobacco, and other drug use in the population ages 12-65 (Villatoro et al., 2017). The survey used probabilistic, stratified, and multistage sampling. Selection probabilities were assigned to households and individuals, and localities stratified as rural, urban, or metropolitan.

Sample description

The first sampling stage selected Basic Geographic Areas (Áreas Geográficas Básicas, Spanish acronym AGEB) within each stratum. The second stage randomly selected blocks and homes. Finally, an adult aged 18-65, and also where possible a household member aged 12-17, was randomly selected in each dwelling. The response rate was 74%, yielding a final sample of 56,877 participants: 51.7% women and 48.3% men.

Measurements

Data were collected through a standardized, previously validated questionnaire (Reséndiz et al., 2018; Villatoro et al., 2003). Many participants were interviewed using an audio computer-assisted self-interview (ACASI), but if requested, a face-to-face interview was conducted. The interview lasted approximately 90 minutes. Survey administrators explained the objectives and characteristics of the study, assured participants of the anonymity of the information and checked that the questionnaires were properly filled out.

- *Opinion on medical marijuana use, with the question:* "Should medical use of marijuana be permitted?" (Response options: yes = 1 or no = 0)
- *Opinion on recreational marijuana use, with the question:* "Should recreational use of marijuana be permitted?" (Response options: yes = 1 or no = 0)
- *Opinion on the legalization of marijuana use, with the question:* "Should marijuana use be legalized?" (Response options: yes = 1 or no = 0)
- *Marijuana use:* non-user = 0, has never used marijuana; user = 1, has used marijuana.
- *Sex:* male = 1 or female = 2
- *Age:* 12-17 = 1, 18-29 = 2, 30-39 = 3, 40-49 = 4, or 60-65 = 5 years
- *Religion:* Protestant/Catholic/Jewish = 0, other = 1, none = 2
- *Educational attainment:* elementary school or less = 1, junior high school = 2, high school = 3, undergraduate degree or higher = 4
- *Monthly family income, in terms of the 2016 daily minimum wage in Mexico of MXN $73.03 (USD $3.65) × 30 days/month:* less than twice the minimum wage (USD $109.50 per month or less) = 1, three to six times the minimum wage (USD $328.80 to USD $666.30) = 2, more than six times the minimum wage (more than USD $666.31) = 3
- *Children:* does/does not have children (0 and 1)
- *Exposure to marijuana*, with the question "Has a friend ever offered you marijuana?" (Response options: yes = 1 or no = 2)
- *Excessive alcohol use:* defined as having consumed, on a single occasion in the 30 days prior to the survey, five or more drinks for men, or four or more for women
- *Perception of risk in marijuana use:* this refers to the perceived danger of using marijuana (Response options: is/isn't dangerous)

Procedure

Three hundred and twenty-three interviewers, supervisors, cartographers, computer assistants and coordinators were trained in May 2016. Information was collected from June 1 to October 30, 2016. To this end, the cartographers paid an initial visit to selected towns and blocks to draw maps and make lists of the households in each block to conduct a probabilistic selection of households and identify risk areas. The interviewers administered the household questionnaire in the selected dwellings and once this stage had been completed, the computer application selected an adult and/or adolescent to answer the individual questionnaire, face to face and with the help of a computer. The supervisors verified each of the non-response codes in the dwellings and household members selected. For each dwelling selected, at least four visits were scheduled at different times and on different days, including weekends, to increase the likelihood of finding the occupants at home. Field operating personnel were organized into eight routes, each consisting of one coordinator, two computer assistants, seven supervisors, and four interviewers per supervisor.

Statistical analyses

Descriptive analyses were conducted to determine the percentages of opinions concerning medical and recreational use, and the legalization of marijuana in each of the categories of contextual and sociodemographic variables of interest, using Stata version 17. To determine which variables predicted or were associated with favorable opinions, a multiple logistic regression was performed for the total population. Three additional multiple logistic regressions were conducted to determine the specific predictors for each of the two groups based on marijuana use (non-user, user). Multiple logistic regressions were performed with Stata version 17 (StataCorp, 2021).

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki and approved by the Research Ethics Committees of the National Institute of Public Health (IRB 0000676P) and the Ramón de la Fuente Muñiz National Institute of Psychiatry (IRB 00006105). All participants provided informed consent, and information was only collected from those who agreed to participate. Parents of minors under 18 years of age signed the informed consent form, and the minors were asked for their assent. All participants were assured of the voluntary nature of their participation and the confidentiality of the information obtained.

RESULTS

Sample characteristics

The sex distribution of the sample was 48.3% men and 51.7% women; 80% of the total were under 50 and 30% aged 18-29. Of the total, 8.6% reported having no religion and 60% had children. A third of the sample had completed junior high school and 14.4% held college degrees, while a majority had a family income less than twice the minimum wage (Table 1). A total of 26.6% of those interviewed said they had been offered marijuana without having to pay for it; this percentage was higher among men (39.6%) than women (14.4%). A total of 40% believed it was dangerous to use marijuana (33% of men and 42.1% of women). Excessive alcohol consumption in the month prior to the survey was reported by 20% of participants participant (29.9% of the men and 10.3% of the women). A total of 8.6 % reported using marijuana (14% of men and 3.7% of women; Table 1).

Opinions on Use and Legalization

Table 2 shows the results of an analysis of variables associated with a favorable opinion on medicinal and rec-

Table 1
Sociodemographic Characteristics

	Male		*Female*		*Total*	
Variable	*n = 27 472*	*%*	*n = 29 405*	*%*	*n = 56 877*	*%*
Age (years)						
12-17	4 835	17.6	4 728	16.1	9 563	16.8
18-29	8 330	30.3	8 475	28.8	16 806	29.5
30-39	4 754	17.3	5 750	19.5	10 504	18.5
40-49	4 144	15.1	4 925	16.7	9 069	15.9
50-65	5 400	19.7	5 536	18.8	10 936	19.2
Religion						
Protestant, Catholic, Jewish	23 478	85.5	26 377	89.7	49 855	87.7
Other	1 075	3.9	1 034	3.5	2 110	3.7
None	2 909	10.6	2 003	6.8	4 912	8.6
Educational Attainment						
Elementary or less	5 938	22.1	6 991	24.4	12 930	23.3
Junior High	9 290	34.6	10 743	37.5	20 033	36.1
High School	7 206	26.8	7 346	25.7	14 552	26.2
College or more	4 453	16.6	3 547	12.4	8 000	14.4
Family Income						
< 2x minimum wage	16 320	65.4	18 023	67.8	34 343	66.7
3-6x minimum wage	7 679	30.8	7 705	29.0	15 384	29.9
> 6x minimum wage	942	3.8	836	3.1	4 919	3.5
Children						
Yes	14 700	53.5	19 436	66.1	34 136	60.0
No	12 763	46.5	9 978	33.9	22 741	40.0
Type of Marijuana User						
Non-user	23 627	86.0	28 331	96.3	51 958	91.4
User	3 845	14.0	1 074	3.7	3 100	8.6
Friend Offered Marijuana?						
Yes	10 882	39.6	4 228	14.4	15 110	26.6
No	16 581	60.4	25 186	85.6	41 767	73.4
Perception of Risk of Marijuana Use						
Dangerous	9 057	33.0	12 392	42.1	21 449	37.7
Not dangerous	18 406	67.0	17 022	57.9	35 428	62.3
Excessive Alcohol Use						
Yes	8 208	29.9	3 026	10.3	11 234	19.8
No	19 255	70.1	26 388	89.7	45 643	80.2

Note: *n* = sample size of specific group.

reational use, and legalization in the general population. Positive opinions on medical use were more common among men, marijuana users, those who had completed junior high school or more, had a monthly family income of more than six times the minimum wage, were childless, had ever been offered marijuana without having to pay for it, or who had a low-risk perception of marijuana use. Those who were aged 30 or younger or had a non-Christian religious affiliation were less in favor of medical use than those aged 50-65 and those with a Christian affiliation (Table 2).

The populations most in favor of recreational use were men, those who had used marijuana, had no religious affiliation, held a bachelor's degree or more, had a monthly family income of three to six times the minimum wage, or were childless. Having been offered marijuana without hav-

Table 2

Logistic Regressions for Medicinal and Recreational Use and Marijuana Legalization, Ages 12-65 (n = 56 877)

	In favor of Medicinal Use				*In favor of Recreational Use*				*In favor of Legalization*			
Variable	*%*[1]	*OR*	*CI 95%*	*p*	*%*[1]	*OR*	*CI 95%*	*p*	*%*[1]	*OR*	*CI 95%*	*p*
Sex												
Female	58.5	1.00			8.6	1.00			14.8	1.00		
Male	65.4	1.11	1.03-1.19	.005	16.6	1.37	1.22-1.53	< .001	22.0	1.11	1.01-1.22	.035
Age (years)												
50-65	63.3	1.00			9.4	1.00			13.6	1.00		
40-49	65.0	.99	.89-1.10	.854	10.9	1.11	.93-1.34	.255	16.6	1.18	1.02-1.37	.030
30-39	63.2	.79	.71-0.87	< .001	12.5	1.13	.95-1.35	.176	18.9	1.17	1.01-1.36	.036
18-29	64.7	.65	.58-0.72	< .001	16.7	1.16	.97-1.39	.095	22.9	1.11	.95-1.29	.178
12-17	50.3	.51	.44-0.58	< .001	9.9	.89	.72-1.10	.273	16.2	1.10	.93-1.32	.268
Type of Marijuana User												
Non-user	60.4	1.00			10.1	1.00			15.9	1.00		
User	76.7	1.61	1.39-1.86	< .001	37.7	2.84	2.43-3.32	< .001	43.0	2.27	1.96-2.63	< .001
Religion												
Protestant, Catholic, Jewish	61.6	1.0			11.7	1.0			17.4			
Other	56.8	.83	.70-.98	.026	10.7	.88	.65-1.19	.410	15.5	.87	.67-1.13	.281
None	66.8	1.08	.96-1.22	.176	21.4	1.44	1.21-1.71	< .001	28.8	1.46	1.26-1.69	< .001
Educational Attainment												
Elementary School or less	52.3	1.00			9.3	1.00			13.2			
Junior High	57.6	1.31	1.21-1.41	< .001	11.0	1.02	.88-1.19	.772	15.8	1.06	.94-1.20	.327
High School	68.9	1.97	1.79-2.17	< .001	14.3	1.12	.95-1.32	.185	21.4	1.34	1.16-1.54	< .001
College or more	76.4	2.56	2.21-2.97	< .001	18.6	1.49	1.23-1.81	< .001	28.2	1.91	1.62-2.23	< .001
Family Income												
< 2x minimum wage	58.9	1.00			11.2	1.00			16.7			
3-6x minimum wage	65.2	1.07	.99-1.15	.094	14.6	1.13	1.01-1.27	.031	21.0	1.09	.99-1.19	.086
> 6x minimum wage	74.2	1.26	1.01-1.57	.040	21.0	1.33	.92-1.91	.133	27.5	1.15	.91-1.45	.240
Children												
Yes	62.1	1.00			10.6	1.0			15.9			
No	61.4	1.13	1.03-1.24	.014	15.3	1.33	1.14-1.56	< .001	21.8	1.27	1.13-1.42	< .001
Friend Offered Marijuana?												
No	59.1	1.00			9.6	1.0			15.0			
Yes	71.0	1.33	1.22-1.46	< .001	22.1	1.32	1.18-1.49	< .001	29.0	1.30	1.16-1.45	< .001
Perception of Risk of Marijuana Use												
Dangerous	54.1	1.00			7.2	1.0			11.5			
Not dangerous	66.5	1.46	1.36-1.56	< .001	15.7	1.75	1.56-1.96	< .001	22.4	1.78	1.62-1.95	< .001
Excessive Alcohol Use												
No	59.9	1.00			9.8	1.0			15.3			
Yes	69.5	1.10	1.00-1.22	.056	23.4	1.68	1.49-1.90	< .001	30.3	1.56	1.40-1.73	< .001

Note: [1] Percentage in favor of each category of predictors; *n* = sample size of specific group; OR = Odds ratio; CI = Confidence Interval; *p* = probability.

ing to pay for it, having a low-risk perception of marijuana use, and having consumed alcohol excessively at least once during the thirty days prior to the survey were also significant predictors of supporting recreational marijuana use (Table 2).

The legalization of marijuana elicited greater approval among men, people between the ages of 30 and 49, people who used marijuana, those without religious affiliation, those who had completed high school or more, and those who were childless. It also enjoyed greater approval among respondents who had been offered marijuana without having to pay for it, had a low-risk perception of its use, or reported having drunk alcohol excessively (Table 2).

Opinions on Use and Legalization by Users and Non-Users

Variables were also analyzed separately for marijuana users and non-users. For non-users, the variables associated with the approval of medical use were being male, being 50 or older, and having completed junior high school or more, with the strongest association being found in those with a bachelor's degree or higher. Having received offers of marijuana without having to pay for it, a low- risk perception of its use, and having engaged in excessive alcohol consumption were also associated with this opinion (Table 3).

Table 3
Multiple Logistic Regression for Medicinal Use by Type of Marijuana User

	Nonusers (n = 49 643)				*Users (n = 4 818)*			
Variable	*%*[1]	*OR*	*CI 95%*	*p*	*%*[1]	*OR*	*CI*	*p*
Sex								
Female	57.9	1.0			72.9	1.0		
Male	63.4	1.11	1.03-1.19	.005	77.8	1.43	1.06-1.92	.019
Age (years)								
50-65	62.7	1.0			74.8	1.0		
40-49	64.4	.99	.89-1.10	.791	73.8	1.20	.72-2.00	.478
30-39	62.0	.79	.71-.88	< .001	75.2	.82	.52-1.29	.384
18-29	62.2	.64	.58-.72	< .001	80.0	.77	.51-1.18	.236
12-17	49.2	.51	.44-.59	< .001	70.0	.58	.34-1.00	.051
Religion								
Protestant, Catholic, Jewish	60.4	1.0			75.2	1.0		
Other	54.6	.81	.69-.95	.010	77.0	1.27	.52-3.14	.601
None	63.2	1.04	.92-1.19	.496	83.3	1.38	1.01-1.88	.042
Educational Attainment								
Elementary School or less	51.4	1.0			65.9	1.0		
Junior High	56.5	1.31	1.21-1.42	< .001	69.6	1.32	.94-1.86	.114
High School	67.3	1.94	1.75-2.14	< .001	83.0	2.69	1.80-4.01	< .001
College or more	74.7	2.46	2.13-2.84	< .001	89.5	4.92	2.94-8.23	< .001
Family Income								
< 2x minimum wage	57.5	1.0			75.0	1.0		
3-6x minimum wage	63.7	1.08	1.00-1.16	.055	78.2	.86	.66-1.12	.271
> 6x minimum wage	71.0	1.21	.96-1.54	.113	92.1	1.76	.83-3.74	.142
Children								
Yes	64.4	1.0			71.4	1.0		
No	58.9	1.10	.99-1.22	.084	82.3	1.43	1.02-2.00	.040
Friend Offered Marijuana?								
Yes	58.7	1.0			73.6	1.0		
No	68.2	1.34	1.22-1.48	< .001	77.6	1.30	.97-1.75	.083
Perception of Risk of Marijuana Use								
Dangerous	53.9	1.0			59.2	1.0		
Not dangerous	64.6	1.42	1.33-1.53	< .001	80.3	2.22	1.62-3.04	< .001
Excessive Alcohol Use								
Yes	59.1	1.0			75.0	1.0		
No	66.9	1.10	1.00-1.22	.053	78.5	1.05	.81-1.36	.735

Note: [1] Percentage in favor of medicinal use for each category of predictors; *n* = sample size of specific group; OR = Odds ratio; CI = Confidence Interval; *p* = probability.

Table 4
Multiple Logistic Regression for Recreational Use by Type of Marijuana User

	Non-users (n = 50 666)				*Users (n = 4 790)*			
Variable	*%*[1]	*OR*	*CI 95%*	*p*	*%*[1]	*OR*	*CI 95%*	*p*
Sex								
Female	7.6	1.00			34.3	1.00		
Male	13.0	1.42	1.26-1.59	< .001	38.7	1.34	1.03-1.75	.032
Age (years)								
50-65	8.6	1.00			26.2	1.00		
40-49	9.8	1.11	.90-1.35	.326	27.8	1.30	.75-2.24	.353
30-39	10.1	1.12	.93-1.35	.216	36.3	1.30	.82-2.05	.265
18-29	12.4	1.15	.95-1.39	.153	44.0	1.34	.87-2.06	.185
12-17	8.4	.85	.66-1.08	.188	35.6	1.16	.69-1.96	.582
Religion								
Protestant, Catholic, Jewish	9.6	1.00			36.5	1.00		
Other	9.1	.94	.68-1.31	.722	26.2	.69	.40-1.18	.171
None	16.1	1.53	1.25-1.86	< .001	45.9	1.21	.89-1.64	.213
Educational Attainment								
Elementary School or less	8.1	1.00			26.7	1.00		
Junior High	9.0	1.03	.88-1.19	.746	31.8	1.08	.72-1.61	.706
High School	11.0	1.07	.90-1.27	.469	43.3	1.41	.94-2.11	.097
College or more	14.6	1.42	1.14-1.76	.002	51.1	1.89	1.21-2.96	.005
Family Income								
< 2x minimum wage	9.4	1.00			32.9	1.00		
3-6x minimum wage	11.3	1.11	.97-1.26	.128	43.8	1.21	.94-1.56	.142
> 6x minimum wage	15.4	1.33	.85-2.07	.217	52.8	1.24	.72-2.13	.446
Children								
Yes	9.1	1.00			29.0			
No	11.6	1.27	1.04-1.53	.016	47.0	1.53	1.18-1.99	.002
Friend offered Marijuana?								
Yes	9.0	1.00			34.4	1.00		
No	15.2	1.40	1.22-1.60	< .001	38.6	1.08	.80-1.47	.613
Perception of Risk in Marijuana Use								
Dangerous	6.9	1.00			14.3	1.00		
Not dangerous	12.2	1.60	1.43-1.79	< .001	42.5	3.32	2.38-4.62	< .001
Excessive Alcohol Use								
Yes	8.8	1.00			27.6	1.00		
No	16.4	1.56	1.35-1.80	< .001	46.5	2.05	1.64-2.56	< .001

Note: [1] Percent in favor of recreational use for each category of predictors; *n* = number of participants in the specific group; OR = Odds ratio; CI = Confidence Interval; *p* = probability.

Among users, being male, having higher educational achievement, no religious affiliation, and being childless were significantly related to approval of medical use. A low-risk perception of its use and engaging in excessive alcohol consumption were also significantly associated. Having a bachelor's degree or more was the variable with the highest association, indicating that the higher a person's educational attainment, the more likely they were to have a positive opinion in this respect (Table 3).

Among non-users, approval of recreational use was associated with being male, having a bachelor's degree or higher, having no religious affiliation, and being childless. It was also significantly associated with having received offers of marijuana without having to pay for it, a low-risk perception of its use, and excessive alcohol consumption in the previous thirty days (Table 4).

Among users, approval of recreational use was higher among men, those who held a bachelor's degree or higher, or who were childless. Once again, this approval was significantly associated with low-risk perception and high alcohol consumption (Table 4).

Among non-users, support for legalization was most strongly associated with being male, aged 40-49, having completed high school or more, having no religious affiliation, and being childless. Having received offers of marijuana without having to pay for it, having a low-risk perception of its use, and excessive alcohol consumption were also associated with this opinion (Table 5).

Table 5
Multiple Logistic Regression for Legalization by Type of Marijuana User

	Non-users (n = 50 341)				*Users (n = 4 742)*			
Variable	*%*[1]	*OR*	*CI 95%*	*p*	*%*[1]	*OR*	*CI 95%*	*p*
Sex								
Female	13.7	1.00			42.4	1.00		
Male	18.6	1.13	1.02-1.24	.015	43.1	1.10	.83-1.44	.515
Age (years)								
50-65	12.7	1.00			31.9	1.00		
40-49	15.6	1.19	1.02-1.39	.028	31.0	1.18	.72-1.92	.511
30-39	16.7	1.18	1.01-1.37	.037	41.5	1.23	.81-1.87	.328
18-29	18.7	1.12	.95-1.32	.166	49.3	1.12	.74-1.69	.586
12-17	14.8	1.14	.93-1.39	.200	42.7	1.01	.60-1.72	.961
Religion								
Protestant, Catholic, Jewish	15.3	1.00			42.2	1.00		
Other	13.9	.87	.66-1.16	.355	30.0	.87	.53-1.45	.603
None	24.3	1.54	1.30-1.83	< .001	49.5	1.17	.88-1.56	.277
Educational Attainment								
Elementary School or less	12.1	1.00			30.4	1.00		
Junior High	14.0	1.08	.96-1.22	.215	35.1	1.00	.70-1.42	.985
High School	18.1	1.30	1.13-1.50	< .001	50.9	1.55	1.08-2.24	.018
College or more	24.6	1.91	1.63-2.23	< .001	57.4	1.85	1.21-2.81	.004
Family Income								
< 2x minimum wage	14.9	1.00			38.1	1.00		
3-6x minimum wage	18.1	1.08	.97-1.19	.148	47.2	1.06	.83-1.35	.640
> 6x minimum wage	22.0	1.12	.87-1.44	.372	57.8	1.17	.66-2.06	.588
Children								
Yes	14.5	1.00			33.4	1.00		
No	18.1	1.17	1.02-1.34	.022	53.3	1.81	1.38-2.37	< .001
Friend Offered Marijuana?								
Yes	14.4	1.00			41.5	1.00		
No	23.0	1.37	1.21-1.55	< .001	43.4	.96	.72-1.28	.759
Perception of Risk in Marijuana Use								
Dangerous	11.2	1.00			18.3	1.00		
Not dangerous	19.1	1.67	1.52-1.84	< .001	48.1	3.32	2.42-4.53	< .001
Excessive Alcohol Use								
Yes	14.3	1.00			33.7	1.00		
No	24.1	1.49	1.32-1.68	< .001	51.2	1.81	1.44-2.27	< .001

Note: [1] Percent in favor of marijuana legalization for each category of predictors; *n* = sample size of the specific group; OR = Odds ratio; CI = Confidence Interval; *p* = probability.

Among users, there was a significant association with having completed more than high school, being childless, having a low-risk perception, and having engaged in excessive alcohol consumption (Table 5).

DISCUSSION AND CONCLUSION

Being male and having a low-risk perception of the use of marijuana are variables associated with approval of its medical use, recreational use, and legalization, irrespective of whether respondents to the 2016 ENCODAT survey used it. The association between being male and supporting legalization coincides with the results of Maričić et al. (2013), Schepis et al. (2011) and Felson et al. (2019). In keeping with these authors, the adverse opinion of women towards legalization may be related to having children, a tendency to engage in lower consumption and higher risk perception (Felson et al., 2019).

One variable associated with a positive opinion of use and legalization is education, with people with higher educational attainment, such as a bachelor's degree, tending to support recreational use. This coincides with what has been reported in other studies (Felson et al., 2019; Maričić et al., 2013; Schepis et al., 2011; Sznitman, & Bretteville-Jensen, 2015). Two other variables that are significant for almost all analyses are parenthood and excessive alcohol consumption. Parenthood is not significantly associated with support for medical use among non-users. We think it would be advisable to further explore this variable in future studies, given that, as Musgrave and Wilcox (Musgrave & Wilcox, 2014) note, parents tend to be more opposed to both legalization and any form of use than people without children. The only cases where excessive alcohol consumption was not associated with a favorable opinion was for medical use among the general population and non-users. This association between alcohol consumption, recreational use, and marijuana use is similar to that reported by Chiu et al. (2021).

Having no religious affiliation is associated with favorable opinions of recreational use and legalization among the general population. An analysis of users versus non-users also finds that this variable is significantly related to approval of medical use in both groups and of recreational use and legalization among non-users. Various authors (Felson et al., 2019; Hai, 2018; Krystosek, 2016; Maričić et al., 2013; Musgrave & Wilcox, 2014; Schepis et al., 2011) have observed this association between lack of religious affiliation and approval of marijuana use. Musgrave and Wilcox (2014) believe this association is due, among other things, to religious believers considering marijuana use a moral issue, and therefore that recreational use is "wrong."

The greater support for legalization among users than non-users is consistent with the literature (Salas et al., 2020; Palali & van Ours, 2017; Schnabel & Sevell, 2017; Trevino & Richard, 2002). The variables that differed between the two groups were age, religion, and having been offered marijuana without having to pay for it. The latter variable did not prove significant for either group of users.

The profile of an average non-user who would support legalization is a man aged 40-49, with at least a high school education, no religious affiliation, no children, with a low perception of the risk of marijuana use, who has engaged in excessive alcohol consumption, and who has been offered marijuana without having to pay for it. In this same group, the variable not associated with supporting recreational use is religious affiliation. Educational attainment is significant if the person holds a bachelor's degree but is not associated with age. We assume that if a person has at least a bachelor's degree, they are over 18, the age of majority in Mexico.

The answer to the central question of this study is that there are differences in the variables related to the approval of medical and recreational use, and legalization of marijuana. The variables associated with support or lack of support for all three issues are age, educational attainment, and income.

In Mexico, policies criminalizing marijuana have failed: there has been no reduction in use and corruption levels are high. The challenge is to find a model that does not increase use or criminalize users, and considers the results presented in research on participants, which considers the profile of users or the age of onset of marijuana use. Understanding popular opinion on these issues is a key part of the search for a new model, and the results presented in this study contribute to this understanding.

The proposals against prohibition and for the legalization of marijuana in Mexico are the result of popular initiatives rather than government policy. In 2013, SMART, the Mexican Society for Responsible and Tolerant Personal Use (Sociedad Mexicana de Autoconsumo Responsable y Tolerante) went to court to demand the right to grow and use small amounts of marijuana, and in 2018, the Supreme Court ordered Congress to enact legislation legalizing recreational use. However, it was not until July 2021 that the prohibition of marijuana for personal recreational use was repealed. A regulatory mechanism for the purchase of seeds and the possession and use of marijuana for recreational purposes is still pending. Popular opinion has not been considered in designing this regulatory process, but we believe it must be considered if these measures and policies are to achieve positive results.

We believe that the disparagement with which marijuana users are treated is based on a moralistic, usually groundless judgment, and that legislators and policy makers should reconsider their opinions. This would enable legislative and regulatory decisions to be inclusive, by respecting and validating the range of positions on marijuana use.

Chiu et al. (2021) attribute low-risk perception, which Andreas et al. (2021) and Salas et al. (2020) found among students who supported legalization, to media influence. We believe that the media play an important role in changing people's opinion on the regulation of marijuana. We agree with Felson et al. (2019), who address the shaping of public opinion in their discussion of legalization. As noted in studies of Mexico (Mitofsky, 2021; Parametria, 2018), public opinion has undergone significant changes in recent years, tending toward greater approval. We believe that the interaction of media messages regarding the benefits of cannabis and public opinion has steered governments in the region toward relaxing legislation (Schleimer et al., 2019) and contributed to the normalization of marijuana use (Carliner et al., 2017; Pennay & Measham, 2016). However, since our study did not include questions related to media influence on opinions regarding the use and legalization of marijuana, this interpretation remains a hypothesis to be tested in future research.

In future research, it would be useful to use representative samples such as the one in this study to examine the hypothesis of Roy Campos, director of the Mitofsky Group, who believes that growing support for the decriminalization of marijuana in Mexico is due to the perception that prohibition does not make it more difficult to obtain marijuana, and that continuing the approach of criminalization will not solve the problem of violence. In other words, citizens have already disentangled the issue of violence in Mexico from the issue of marijuana use.

Limitations

One limitation in this study is that the 2016 ENCODAT survey did not explore respondents' reasons for approving medical and recreational use. Neither did it evaluate people's exposure to information or the influence of news media and social media on their opinions on medical and recreational use, or legalization of marijuana, even though this exposure has consistently been associated with public opinion. Moreover, since the opinions expressed by those who participated in the study correspond to the end of 2016, they are likely to have changed since then.

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Conflicts of interest

The authors declare they have no conflicts of interests.

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Quality of Life and Medication Therapy Adherence in Primary Healthcare: focus on common mental disorders

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ABSTRACT

Introduction. Medication therapy adherence is a challenge in the clinical practice of health providers. **Objective.** To identify predictors of nonadherence to medication therapy and quality of life (QoL) in medication users. **Method.** A cross-sectional analytical study was conducted at five primary health care (PHC) units in Brazil. Standardized tools included the Self-Reporting Questionnaire, Measurement of Treatment Adherence, and World Health Organization Quality-of-Life-Bref, in addition to a sociodemographic and treatment-related questionnaire. **Results.** Participants with common mental disorders (CMDs) who used psychotropic medication were more likely to be nonadherent to medication treatment. Sociodemographic variables, presence of a CMD, and psychotropic medication use were key predictors of lower QoL in patients treated at PHC. **Discussion and conclusion.** The findings of this study could inform interventions designed to improve medication therapy adherence and train public health care professionals to enhance health care.

Keywords: Medication adherence, mental disorders, primary health care, quality of life.

RESUMEN

Introducción. La adherencia al tratamiento farmacológico es un desafío en la práctica clínica de los profesionales de la salud. **Objetivo.** Identificar los predictores de la no adherencia a la farma-coterapia y los predictores de la calidad de vida en los usuarios de medicamentos. **Método.** Estu-dio analítico transversal realizado en cinco unidades de atención primaria de salud (APS) en Bra-sil. Las herramientas estandarizadas incluyeron el Cuestionario de autoinforme, la Prueba de me-dición de la adherencia al tratamiento y el Resumen de WHOQOL, además de un cuestionario sociodemográfico relacionado con el tratamiento. **Resultados.** Los participantes con trastornos mentales comunes (TMC) y que usan psicofármacos fueron más vulnerables a la falta de adheren-cia al tratamiento con medicamentos. Las variables sociodemográficas, la presencia de TMC y el uso de psicofármacos fueron predictores importantes de una peor calidad de vida en los pacientes atendidos en la APS. **Discusión y conclusión.** Los hallazgos de este estudio pueden respaldar intervenciones dirigidas a la adherencia al tratamiento farmacológico y capacitar a los profesiona-les de la salud pública para mejorar la atención médica.

Palabras clave: Adherencia a la medicación, desórdenes mentales, primeros auxilios, calidad de vida.

INTRODUCTION

The main purpose of primary health care (PHC) is to achieve the highest attainable level of health (World Health Organization [WHO], 2021). PHC includes comprehensive, integrated healthcare services focusing on primary care, public health policies; and the social participation of communities, families, and individuals in self-reliance and self-care for health (WHO, 2021).

In health care contexts, medication therapy adherence is a challenge in the clinical practice of health providers, including nursing professionals. WHO (2021) defines therapy adherence as the degree to which a person's behavior, comprising medication intake, dietary follow-up, and lifestyle changes, corresponds to the recommendations of a health provider.

The literature shows how adherence can be associated with patient behavior regarding medicine intake by dosage, frequency, and medication regimen (Gast & Mathes, 2019). Medication nonadherence is associated with medication regimen complexity, lack of care continuity between the health provider and patient, fear of dependence or adverse effects (Ismail et al., 2017), psychological factors, educational attainment, and socioeconomic level (Gast & Mathes, 2019; Prakash et al., 2019).

The literature shows that there is a high percentage of patients who interrupt therapy without informing a health provider, and that approximately 50% of patients fail to take medication as prescribed (Kim et al., 2018). This scenario may reduce treatment efficacy, increasing the risk of recurrence of the pathology being treated (El Abdellati et al., 2020; Gupta et al., 2017) and encouraging the use of otherwise unnecessary and/or dangerously intensified therapies (Lam & Fresco, 2015), which can seriously harm patient health and possibly their quality of life (QoL).

The psychological barriers to adherence can be divided into two categories: intentional and unintentional (Martin et al., 2018). When intentional, the patient decides to modify or discontinue their treatment. When unintentional, the patient believes that the treatment is in fact being properly followed, or unintentionally fails to do so (such as forgetting to take the medicine at the correct time; Martin et al., 2018).

Psychotropic medications are a therapeutic class of medication that warrant highlighting when discussing medication adherence, given the complications resulting from inadequate use (El Abdellati et al., 2020). Patients with mental disorders have difficultly adhering to prescribed psychotropic medication, resulting in a high nonadherence rate among this population (Semahegn et al., 2020).

There is evidence that inadequate pharmacological treatment among people with mental disorders is more pronounced at PHCs than in specialized services, which is of particular interest to the present study. In addition, certain psychotropic medications are often prescribed for prolonged periods, contributing to treatment ineffectiveness and the likelihood of harm to the patient (Magin et al., 2018; Wand, 2019).

The literature notes that patients with common mental disorders (CMDs) are more likely to use psychotropic medication (Pereira Júnior et al., 2021). CMDs are a group of distress states manifesting as somatic symptoms, anxiety, and depression (Malhotra & Shah, 2015). A study of PHC patients observed that, compared with other patients, those with a CMD had lower QoL (Pereira Júnior et al., 2021). Furthermore, CMD patients using psychotropic medication have poor QoL (Miasso et al., 2017).

Other variables, such as clinical diseases, also significantly affect the QoL of the population served at PHC units (González-Blanch et al., 2018). It should be emphasized that QoL is a key indicator in relation to healthcare and global health needs and can be used as a basis for formulating public policies/recommendations.

Our study was designed based on the importance of PHC as a gateway to the health system, the high prevalence of CMDs, the importance and impact of medication therapy nonadherence, including psychotropic medications that have potentially serious consequences for patients, and the need to investigate the multiple factors potentially involved in medication therapy adherence and QoL.

In this study, we therefore sought to identify the predictors of nonadherence to psychotropic medication therapy and medication therapy in general, as well as quality-of-life predictors in medication users attending PHC units of the Unified Health System (UHS) in Brazil.

METHOD

Study design

This was a quantitative, observational, cross-sectional analytical study conducted of the UHS in Brazil at five PHC units in Ribeirão Preto, a municipality in the state of São Paulo, Brazil. We selected the PHC units with the largest catchment area in each health sector in the city under study.

Participants

A sampling plan was used to conduct stratified sampling with proportional allocation by strata. Each stratum comprised one of the five PHCs. The tolerable sampling error was 5%, and the level of significance 5%. A nonresponse rate of 15% was added, yielding a sample of 430 participants.

To collect the data, we approached participants waiting for medical appointments at the health units. Data were collected through individual interviews at the units under study. The inclusion criteria for the study were a) being aged 18 years or over and b) having a medical appointment scheduled in the units under study. The exclusion criterion was communication difficulties (such as impaired speech or hearing).

Measurements

Dependent variables

Dependent variables included adherence to psychotropic medication therapy, adherence to medication treatment in general, and QoL.

Independent variables and covariables

Independent variables were those associated with the sociodemographic profile (educational attainment, marital status, religion, occupation, number of family members), economic profile (monthly income, monthly family income), pharmacotherapeutic profile (medication use, psychotropic medication use, number of medications, number of pills taken daily, confidence in the doctor responsible for follow-up), and medical history (clinical diseases [self-reported] and common mental disorders). The covariables of sex and age were controlled for.

Procedure

Data for the independent variables and covariables were collected through a structured questionnaire created for the study, with questions on the respondent's medical history and sociodemographic, economic, and pharmacotherapeutic profile.

We assessed medication adherence through the Measure Treatment Adherence-MTA (Delgado & Lima, 2001), a validated instrument comprising seven items for respondents to rate on an ordinal, six-point scale ranging from *always* (1) *to never* (6). The total MTA score was divided by the total number of questions, and the value was converted into a dichotomous scale. Values from one to four were considered to represent nonadherence while values from five to six were considered to represent therapy adherence. These procedures align with the recommendations available in the study validating the MTA (Delgado & Lima, 2001).

Table 1

Logistic Regression Model for the Prediction of Medication Non-adherence in General in Patients Treated at five PHCs

Model based on the p value of the square, p < .20								
Probability modeled on ADHERENCE = No (n = 282)								
Variable	*Gross OR*	*CI 95%*		*p value*	*Adjusted OR*	*CI 95%*		*p value*
Age								
18 to 40 years	1	.	.	.	.	.	.	.
41 to 59 years	1.8	.9	3.7	.08	1.1	.5	2.4	.91
> 60 years	2.1	1.0	4.4	.04	1.2	.5	3.0	.74
Schooling								
Medium to High	1	.	.	.	.	.	.	.
Low	1.8	1.0	3.0	.04	1.5	.8	2.8	.19
Marital Status								
Partnered	1	.	.	.	.	.	.	.
Unpartnered	1.5	.9	2.5	.14	1.5	.8	2.6	.19
Clinical diseases								
No	1	.	.	.	.	.	.	.
Yes	2.1	1.0	4.6	.05	1.6	.6	4.2	.37
Number of medications								
Up to two	1	.	.	.	.	.	.	.
Three or more	1.8	1.1	3.1	.02	.5	.2	1.4	.20
Number of Pills								
None	1	.	.	.	.	.	.	.
Up to two	2.9	.6	13.2	.17	1.5	.3	7.8	.66
Three or more	5.9	1.3	25.9	.02	3.8	.6	23.7	.16
Use of Non-psychotropic Medication								
No	1	.	.	.	.	.	.	.
Yes	2.3	.7	7.1	.15	2.1	.5	7.9	.29
Use of Psychotropic Medication								
Yes	1	.	.	.	.	.	.	.
No	3.2	1.9	5.5	< .001	2.0	1.1	4.0	.04
CMD								
No	1	.	.	.	.	.	.	.
Yes	2.5	1.5	4.2	< .001	1.9	1.0	3.4	.04

Note: OR = odds ratio; categories with a value of "1" for OR represent the reference categories.

The validated Brazilian version of the Self-Reporting Questionnaire (SRQ–20), comprising 20 items (Mari & Williams, 1986) was used to track CMDs. Since cutoff points suggested by the validation study were used in this study, results were regarded as positive when female respondents answered "yes" to eight or more questions and male respondents answered "yes" to six or more questions.

We used the World Health Organization Quality-of-Life Assessment–BREF (WHOQOL–BREF; Fleck et al., 2000) to evaluate participants' QoL. The Brazilian version of the WHOQOL–BREF was analyzed for the following psychometric characteristics: internal consistency, discriminant validity, concurrent validity, content validity, and test–retest reliability (Fleck et al., 2000). The WHOQOL–BREF comprises 26 questions encompassing four domains: (a) physical, (b) psychological, (c) social relations, and (d) environmental (The WHOQOL Group, 1998).

Statistical analyses

We analyzed the data using SAS (Version 9.2). Chi-square ($\chi 2$) tests were used to check the association between the dependent and independent variables. A logistic regression model was employed to measure the association between the variables of interest and nonadherence using odds ratio (ORs). We selected the variables for the adjusted model using the χ^2 test result and chose the variables with a p value $\leq .20$. This level of significance was adopted to identify the factors most closely related to nonadherence, not merely those with statistical significance, allowing for the inclusion of a greater number of variables in the logistic regression model. We only included variables without multicollinearity problems in the logistic regression model.

To compare the adherence groups and control for the effect of covariates on the WHOQOL–BREF scores, we conducted an analysis of covariance (ANCOVA).

Table 2

Linear regression model for the quality-of-life prediction in the physical domain of the Quality-of-Life Assessment Scale (WHOQOL-BREF), in patients on medication treated at five PHCs

Variable	*Coefficient*	*SE*	*p value*	*CI 95%*	
Intercept	75.17	4.07	< .001	67.15	83.18
CMD					
Yes	-17.16	2.05	< .001	-21.19	-13.13
No	0	.	.	.	.
Clinical Diseases					
Yes	-3.53	2.71	.19	-8.86	1.81
No	0	.	.	.	.
Use of psychotropic medication					
Yes	-6.26	2.14	< .001	-10.47	-2.05
No	0	.	.	.	.
Sex					
Female	.72	2.65	.79	-4.51	5.94
Male	0	.	.	.	.
Age					
18 to 40 years	1.46	3.00	.63	-4.45	7.36
41 to 59 years	-3.96	2.37	.10	-8.62	.70
> 60 years	0	.	.	.	.
Monthly Family Income					
> 3 minimum wages	3.10	1.99	.12	-.82	7.01
< 3 minimum wages	0	.	.	.	.
Occupation					
Employed	6.00	2.16	< .001	1.75	10.24
Unemployed	0	.	.	.	.
Marital Status					
Partnered	-2.87	1.94	.14	-6.70	.96
Unpartnered	0	.	.	.	.
Adherence					
No	-1.99	2.17	.36	-6.26	2.28
Yes	0	.	.	.	.

Note: CI = confidence interval; OR: = odds ratio; CMD = common mental disorders; SE = Standard error.

We verified the reliability of the MTA using Cronbach's α. For the adherence to medication in general variables, the coefficient found was .81 and a value of .91 was obtained for the adherence to psychotropic medication variable.

Because it is a dichotomous instrument, we measured the reliability of the SRQ–20 using the Kuder–Richarson coefficient (KR–20), which was equivalent to .85, showing good internal consistency.

In regard to the WHOQOL–BREF, we used Cronbach's α. In this case, the coefficient was calculated for each domain, because each one consists of a subscale. The Cronbach's αs for each domain were as follows: physical = .80, psychological = .75, social relations = .69, environmental = .74.

Ethical considerations

This study was approved by the Research Ethics Committee (Protocol No. 1474/2011) and followed the guidelines of the Brazilian National Research Council.

RESULTS

A total of 430 users from five PHC units in Ribeirão Preto, São Paulo, Brazil participated in the study. The sample consisted of people aged 18 to 83 (*M* = 45; range = 18–83, *SD* = 16.3). In the sample studied, the prevalence of CMD was 41.4%. In regard to pharmacotherapy, 65.6% of the participants used medication, while 25.8% of the total sample had been prescribed at least one psychotropic medication.

We developed a logistic regression model to evaluate predictors of nonadherence to medication in general. In the adjusted OR analysis, the CMD variables and the use of psychotropic medications were predictive of nonadherence to medication in general. Use of psychotropic medications was the strongest predictor of nonadherence, OR = 2.0 (*p* = .04, confidence interval [CI] [1.1, 4.0]), followed by CMD, OR = 1.9 (*p* = .04, CI [1.0, 3.4]). Participants using psychotropic medications were twice as likely not to adhere to prescription medications as those who did not use psy-

Table 3
Linear regression model for quality-of-life prediction in the psychological domain of the Quality-of-Life Assessment Scale (WHOQOL-BREF) in patients on medication treated at five PHCs

Variable	*Coefficient*	*SE*	*p value*	*CI 95%*	
Intercept	79.57	3.66	< .001	72.35	86.78
CMD					
Yes	-17.58	1.85	< .001	-21.21	-13.95
No	0	.	.	.	.
Clinical Diseases					
Yes	1.71	2.44	.48	-3.09	6.52
No	0	.	.	.	.
Use of psychotropic medication					
Yes	-4.15	1.92	.03	-7.94	-.36
No	0	.	.	.	.
Sex					
Female	-3.70	2.39	.12	-8.40	1.00
Male	0	.	.	.	.
Age					
18 to 40 years	-3.28	2.70	.22	-8.60	2.03
41 to 59 years	-7.59	2.13	< .001	-11.78	-3.39
> 60 years	0	.	.	.	.
Monthly Family Income					
> 3 minimum wages	4.74	1.79	< .001	1.21	8.26
< 3 minimum wages	0	.	.	.	.
Occupation					
Employed	1.29	1.94	.51	-2.53	5.11
Unemployed	0	.	.	.	.
Marital Status					
Partnered	-2.39	1.75	.17	-5.83	1.06
Unpartnered	0	.	.	.	.
Adherence					
No	-3.58	1.95	.07	-7.43	.26
Yes	0	.	.	.	.

Note: CI = confidence interval; OR: = odds ratio; CMD = common mental disorders; SE = Standard error.

chotropic medication, while participants with a CMD were twice as likely not to adhere to prescribed medications as those without a CMD.

Commonly, the most prescribed class of psychotropic medications was antidepressants (73%), followed by benzodiazepine anxiolytics (46.8%). Most prescriptions for psychotropic medications were written by general practitioners in the PHC network (56%), with only 17% being written by psychiatrists.

It worth noting that 42.3% of the participants were considered nonadherent to psychotropic medications.

We developed a logistic regression model to evaluate predictors of nonadherence to psychotropic medications. The gender and monthly income variables, and the question on confidence in the doctor responsible for the follow-up of the interviewees were part of the model. We observed that none of the variables significantly contributed to the model (Table 1).

Regarding QoL, we found that people who adhered to medications in general had higher QoL scores in all WHOQOL–BREF domains.

We created ANCOVA models to predict QoL scores in each domain. Given the objectives of the study and the literature on QoL, we included the following variables: CMDs, clinical diseases, use of psychotropic medication, sex, age, educational attainment, income, occupation, marital status, and medication adherence.

In the linear regression model for the physical domain, the predictors making a significant contribution to the model were CMD ($p < .001$), psychotropic medication use ($p < .001$), and occupation ($p < .001$). People with a CMD, and those who used psychotropic medications tended to obtain worse QoL evaluations, while those who were employed tended to have better QoL evaluations (Table 2).

In the psychological domain, the predictors for worse QoL were as follows: having a CMD ($p < .001$), using psychotropic medications ($p = .03$), and being aged between 41 and 59 years ($p < .001$). Having an income of more than three minimum wages was predictor of better QoL ($p < .001$; Table 3).

Table 4

Linear regression model for quality-of-life prediction in the social relations domain of the Quality-of-Life Scale (WHOQOL-BREF) in patients on medication treated at five PHCs

Variable	*Coefficient*	*SE*	*p value*	*CI 95%*	
Intercept	70.55	4.72	< .001	61.26	79.84
CMD					
Yes	-9.94	2.38	< .001	-14.62	-5.26
No	0	.	.	.	.
Clinical Diseases					
Yes	1.13	3.14	.72	-5.05	7.32
No	0	.	.	.	.
Use of psychotropic medication					
Yes	-3.15	2.48	.21	-8.02	1.73
No	0	.	.	.	.
Sex					
Female	-3.67	3.08	.23	-9.72	2.38
Male	0	.	.	.	.
Age					
18 to 40 years	.41	3.48	.91	-6.43	7.26
41 to 59 years	-4.59	2.74	.10	-9.99	.81
> 60 years	0	.	.	.	.
Monthly Family Income					
> 3 minimum wages	3.93	2.31	.09	-.61	8.47
< 3 minimum wages	0	.	.	.	.
Occupation					
Employed	2.30	2.50	.36	-2.63	7.22
Unemployed	0	.	.	.	.
Marital Status					
Partnered	-1.61	2.25	.47	-6.05	2.82
Unpartnered	0	.	.	.	.
Adherence					
No	-1.47	2.52	.56	-6.42	3.48
Yes	0	.	.	.	.

Note: CI = confidence interval; OR: = odds ratio; CMD = common mental disorders; SE = Standard error.

In the social relations domain, the CMD variable alone contributed significantly to the model ($p < .001$; Table 4).

Regarding the environmental domain, the presence of a CMD was also one of the predictors of worse QoL ($p < .001$). Sociodemographic factors exerted a greater influence. In this case, the predictors found were sex ($p < .001$), income ($p < .001$), and age ($p < .001$). The age variable was significant in the following two categories: a) from 18 to 40 years and b) from 41 to 59 years. We found that belonging to the 18 to 40 and 41 to59 age groups, being female, and earning less than three minimum wages increased the chances of having worse QoL in the environment domain (Table 5).

DISCUSSION AND CONCLUSION

We found that 28% of the participants were considered nonadherent to medications in general. Although this percentage of nonadherence is not among the highest levels found, it impacts both patients and their families because it is associated with poor health outcomes. It also affects the healthcare system, because it results in higher costs (Jin et al., 2016; Miasso et al., 2016).

In the logistic regression model, in the adjusted analysis, CMD variables and the use of psychotropic medications were predictive of nonadherence to medications in general, while the use of psychotropic medications was the strongest predictor of nonadherence. There was a higher frequency of nonadherence among participants with a CMD. The literature confirms the negative influence of CMD on medication therapy adherence (Semahegn et al., 2020). In keeping with the existing literature, our findings raise the issue of the urgent need for actions targeting patients with symptoms of mental health conditions, because nonadherence can interfere with or impair treatment outcomes.

Furthermore, we identified worse QoL in individuals with a prescription for psychotropic medications. In fact, psychotropic medications for CMDs have been described as controversial in the literature. Their lower efficacy, and

Table 5
Linear regression model for quality-of-life prediction in the environmental domain of the Quality-of-Life Scale (WHOQOL-BREF) in patients on medication treated at five PHCs

Variable	*Coefficient*	*SE*	*p value*	*CI 95%*	
Intercept	70.76	3.31	< .001	64.23	77.29
CMD					
Yes	-10.78	1.67	< .001	-14.07	-7.50
No	0	.	.	.	.
Clinical Diseases					
Yes	-.68	2.21	.76	-5.03	3.67
No	0	.	.	.	.
Use of psychotropic medication					
Yes	-.94	1.74	.59	-4.37	2.48
No	0	.	.	.	.
Sex					
Female	-5.92	2.16	< .001	-10.17	-1.67
Male	0	.	.	.	.
Age					
18 to 40 years	-6.82	2.44	< .001	-11.63	-2.01
41 to 59 years	-7.88	1.93	< .001	-11.67	-4.08
> 60 years	0	.	.	.	.
Monthly Family Income					
> 3 minimum wages	4.04	1.62	.01	.85	7.23
< 3 minimum wages	0	.	.	.	.
Occupation					
Employed	2.49	1.76	.16	-.96	5.95
Unemployed	0	.	.	.	.
Marital Status					
Partnered	-2.99	1.58	.06	-6.11	.13
Unpartnered	0	.	.	.	.
Adherence					
No	.48	1.77	.78	-2.99	3.96
Yes	0	.	.	.	.

Note: CI = confidence interval; OR: = odds ratio; CMD = common mental disorders; SE = Standard error.

patients' doubts about therapy efficacy can contribute to nonadherence to psychotropic medication (Semahegn et al., 2020). Psychosocial interventions focusing on pharmacological treatment could therefore be a promising strategy.

In our study, the psychotropic medications most often prescribed to patients at PHC units were antidepressants and benzodiazepines. Prescriptions for antidepressants have seen a steady increase in several countries (Brody & Gu, 2020; Estrela et al., 2020). Factors that can influence the increase of antidepressant prescriptions include a higher prevalence of CMDs, growing access to antidepressants and low investment in nonpharmacological therapies (Estrela et al., 2020).

Benzodiazepines are commonly prescribed to treat anxiety disorders (Tanguay Bernard et al., 2018). Some countries, such as Portugal (Estrela et al., 2020) and Canada (Tanguay Bernard et al., 2018), are concerned about chronic use of benzodiazepines. This concern is associated with long-term prescriptions, resulting in the risk of developing tolerance and dependence (Ogawa, 2019). Another important factor is when mental disorders are masked by somatic complaints (Zheng et al., 2019), making it difficult for clinicians unfamiliar with the cases to make an accurate diagnosis, resulting in the potentially indiscriminate prescription of psychotropic medications.

In our study, the rate of nonadherence to psychotropic medications was 42.3%, while the literature presents wide variations from approximately 20% to 81% (El Abdellati et al., 2020). The consequences of nonadherence to psychotropic medications can be serious, sometimes exacerbating the condition and possibly leading to rehospitalization (Semahegn et al., 2018). In addition to compromising the individual's QoL and affecting cognitive, work, and social aspects, these consequences place a heavy burden on the family and entail high costs for the healthcare system (Semahegn et al., 2018).

Regarding medication adherence, there is evidence that behavioral and multifaceted interventions are more effective in promoting adherence to antidepressants than single component interventions (Pino-Sedeño et al., 2019). It should be emphasized that although, as a member of the health care team, the nurse is responsible for assisting the individual with their medication therapy, in our research, nearly all the information obtained by the participants on psychotropic medications was provided exclusively by physicians (98.4%).

We observed that health education is an important nursing intervention that was not in evidence in the health services under study. Among other aspects, this finding may reflect the lack of therapeutic listening, which allows people's difficulties concerning medication treatment to be identified to select and guide individualized interventions.

In relation to QoL, adherent respondents obtained higher QoL scores in all domains of the WHOQOL–BREF. However, medication therapy adherence was not a predictor of better QoL in the multivariate analysis. About sociodemographic variables, the influences on QoL were statistically significant in the physical and environmental domains. We found that being unemployed was associated with worse QoL in the physical domain. This finding is supported by the literature (Tavakoli-Fard et al., 2016).

The environmental domain had the highest number of sociodemographic variables associated with QoL: age, sex, and income. We found that being aged 18 to 40 or 41 to 59, being female, and having an income of less than three minimum wages increased the chances of a worse QoL in the Environmental domain.

In relation to age, the literature has indicated worse QoL among older people because of the presence of chronic diseases (Ferretti et al., 2018; González-Blanch et al., 2018) and the presence of cognitive decline, affecting their performance of daily activities. This may also be associated with emotional changes and pain (Soósová, 2016), among other factors.

Regarding gender, other studies corroborate our findings in stating that men tend to rate their QoL higher than women do (Lee et al., 2020). The factors influencing adult men's QoL can vary between studies and countries, the main factors being income, the environment, and physical and cognitive function (Bielderman et al., 2015; Lee et al., 2020).

The income variable is related to the environmental domain, because one of the issues comprising this aspect of QoL is financial resources. The literature corroborates the results of our research, noting that income is a key determinant of QoL in men and women (Lee et al., 2020). A good financial situation is therefore associated with better QoL. Another important point is that the stress created by a person's current financial situation may have a greater impact on current mental health than previous life events (Barros et al., 2018).

In our study, having a CMD was the strongest predictor of worse QoL across all domains and the only factor associated with worse QoL in the social relations domain. Other studies have reported that CMD was a predictor of worse QoL (Ausín et al., 2020; Caron et al., 2019). Studies on the subject have shown that although CMDs can be spontaneously resolved, patients with a CMD continue to have a low QoL, corroborating the suggestion that CMDs cause functional impairment in patients and overburden health care systems (Kroenke et al., 2013).

Another relevant finding of our study is the identification of psychotropic medication use as a predictor of worse QoL in the physical and psychological domains. This result confirms the previously discussed hypothesis that, in this sample, psychotropic medications appear to have been used inefficiently. It is worth noting that one study has corroborated the findings of our study by observing that psychotropic medication users have worse QoL, report more somatic diseases, and have a greater need for medical care, together with a higher body mass index (Kopp et al., 2011).

Although psychotropic medications have many benefits, and are essential provided they are properly used, a possible explanation for their negative influence on QoL could be the wide range of their side effects (Semahegn et al., 2020). It is therefore important to advance the development of treatment guidelines to include multidimensional strategies to be implemented in PHC units to promote well-being and improve people's QoL.

The results of our study should be interpreted considering its limitations. The first concerns its cross-sectional nature, which prevents the prediction of causality of the issues addressed. Another limitation is the use of a self-report instrument to assess medication therapy adherence, which may have prompted an overestimation of adherence.

The present findings indicate that strategies to promote medication therapy adherence in PHC services are necessary, especially among psychotropic medication users and people with a CMD.

People with a CMD are one of the largest groups attending PHC units. This is relevant, since this study found that they suffer from psychological distress, use more psychotropic medication than people who do not have a CMD and are therefore more susceptible to the side effects of these medications, and medication therapy nonadherence, all of which negatively affect their QoL.

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Conflict of interest

The authors declare they have no conflicts of interest.

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"Pues que pase lo que Dios quiera": Strategies for Dealing with Emotional Discomfort in Undocumented Mexican Immigrants Living in the United States

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ABSTRACT

Introduction. Undocumented migrants live in a state of social, legal, and political invisibility, which affects their mental health while hindering their access to health services. It is therefore essential to understand which situations are linked to their emotional discomfort and how they cope with it. **Objective.** To explore the sources of emotional discomfort and the strategies used to deal with it in undocumented Mexican migrants residing in an area with a recent migratory tradition. **Method.** Study conducted using qualitative methodology and ethnographic strategies involving four open interviews with key informants and seven semi-structured interviews with undocumented Mexican immigrants. A thematic analysis was conducted of each of them, and the main categories constructed. **Results.** Immigration status was the main source of emotional discomfort, creating sadness, anger, and frustration associated with direct acts of racism and discrimination. Religiosity or spirituality, relaxation, avoidance, self-control ("gritting your teeth and bearing it"), and seeking supportive social networks were the most commonly used strategies for coping with this discomfort. **Discussion and conclusions.** It would be advisable to implement strategies that increased the possibilities of access to professional care, when necessary, without immigrants perceiving a threat due to their immigration status and to promote more robust social networks in the community, as well as virtual networks that could provide an alternative source of care and accompaniment from their place of origin.

Keywords: Mexican immigrants, undocumented migrants, emotional discomfort, coping strategies, structural racism.

RESUMEN

Introducción. Los migrantes indocumentados viven en constante invisibilidad social, legal y política, esto influye negativamente en su salud mental a la vez que dificulta su acceso a servicios de salud. Por ello se plantea como relevante comprender qué situaciones se vinculan con su malestar emocional y qué hacen ante éste. **Objetivo.** Profundizar en las fuentes de malestar emocional y las estrategias utilizadas para afrontarlo en migrantes mexicanos indocumentados residentes en una zona con una tradición migratoria reciente. **Método.** Estudio realizado con metodología cualitativa y estrategias etnográficas, en el que se realizaron cuatro entrevistas abiertas con informantes clave y siete entrevistas semiestructuradas con inmigrantes mexicanos indocumentados. Se llevó a cabo un análisis temático de cada una de ellas y se construyeron las categorías más relevantes. **Resultados.** El propio estatus migratorio fue el principal generador de malestar emocional, destacando la tristeza, pero también el enojo y la frustración asociados con actos directos de racismo y discriminación. Para hacer frente a este malestar, se utilizan principalmente estrategias tales como la religiosidad o espiritualidad, la relajación, la evitación, el auto-control ("aguantarse") y la búsqueda de redes sociales de apoyo. **Discusión y conclusiones.** Es recomendable implementar estrategias que amplíen las posibilidades de acceso a la atención profesional cuando sea necesario, sin percibir una amenaza por su estatus migratorio. Asimismo, promover redes sociales más robustas en la comunidad, al igual que redes virtuales que desde su lugar de origen podrían resultar una alternativa de atención y acompañamiento.

Palabras clave: Inmigrantes mexicanos, migrantes indocumentados, malestar emocional, estrategias de afrontamiento, racismo estructural.

INTRODUCTION

Residing outside one's country of origin without legal documentation places people in a state of acute vulnerability (Critelli & Yalim, 2023; Reyes Miranda et al., 2015). Nearly 50% of the 12 million Mexican immigrants registered in the U.S. are undocumented (CONAPO, 2018), crucially affecting their well-being because they are often stigmatized and marginalized (Reyes Miranda et al., 2015), unable to apply for social benefits, and at a high risk of being hyper-exploited at work (Critelli & Yalim, 2023). This situation constitutes systemic racism, also called institutional or structural racism (Venegas León et al., 2023). Mexican and other Latin American groups experience interpersonal and structural racism, defined as "the totality of ways in which societies foster [race-based] discrimination via mutually reinforcing systems (as in housing, education, employment, earnings, benefits, credit, media, health care and criminal justice)" (Cerda et al., 2023, p. S72). For Young and Crookes (2023), immigration policy is a mechanism of structural racism based on racial inequality. "The U.S. system of racial hierarchy is created by the power of a White-dominant society" (p. S17).

Although this structural racism existed in pre-Trump administrations, under Trump, the rhetoric "normalized" interpersonal racism. "Recent studies show that the increase in anti-immigrant policies in the United States and their focus on the segment of Mexican origin are exacerbating discrimination against the Latino population in general and the Mexican population in particular" (Pérez-Soria, 2022, p. 192).

The threat of deportation and migration-related losses, such as family separation, are associated with emotional discomfort, which can manifest in psychological and somatic symptoms and adverse effects on identity and self-esteem (García, 2018; Garcini, 2016; Phipps et al., 2022). In her theoretical framework, Mabel Burin (1995) reflects on the gender condition of women and their oppression, using the concept of *discomfort* as a category of analysis to address the mental health of men and women, defining it as a subjective sensation of psychic suffering that does not fit within the classic criteria of health or disease. From this perspective, it can be understood as a form of resistance to unequal structural conditions associated with gender. "Most scholars who analyze this problem insist on highlighting how female gender roles affect women's ways of getting sick. Among the most widely studied gender roles are the maternal role, the conjugal role, the role of housewife, and the dual social role of the domestic and extra-domestic worker (creating double shifts) (Burin, 2010, section 3)." In the case of undocumented Mexican immigrants (UMIs), the structural conditions of inequality they face because of their immigration status, together with their ethnicity and place of origin, interact with the individual's need to survive and adapt to a particular cultural/societal milieu and can influence the level of stress they experience as a result (Asnaani et al., 2021). Inter-personal discrimination due to undocumented status has been reported to be the main predictor of clinically significant psychological distress, even greater than a history of trauma (Garcini et al., 2019).

Despite the above, these populations generally fail to seek care in formal health services (Payan, 2022; Tenorio Corro & Arredondo, 2018), either due to the conditions of the U.S. health system or to perceived barriers such as the fear of being detained in these services due to their immigration status, misinformation, the language barrier or high costs of services, time available, distance and lack of transportation (Rastogi et al., 2012; Held et al., 2020).

What do migrants do to cope with emotional discomfort if they do not seek formal support? Stress refers to the problems or strains people encounter throughout life, while coping refers to the behavioral or cognitive responses used to manage stress (Lazarus & Folkman, 1986). Coping is a process used to deal with stressful or problematic experiences. In the case of Latin American immigrants, self-medication is common practice (Wolcott-MacCausland et al., 2020). However, this strategy is designed to reduce physical rather than emotional discomfort. For the latter, strategies such as transnational social networks have been identified (Rios Casas et al., 2020), together with "viewing bad things in a positive light," "obtaining comfort from someone in the community" (Cobb et al., 2016), cognitively resignifying undocumented status using spirituality and optimism, and expressing pride in one's cultural identity (Garcini et al., 2022). Undocumented Latino immigrants are more likely to use religion as a resource in times of need (Sanchez et al., 2015). Indeed, religious coping appears to be related to emotional well-being in undocumented Mexican immigrants since praying is regarded as an active request for help (Abraído-Lanza et al., 2004).

Since these studies have mainly been conducted in areas with a long migratory tradition, the objective of this article is to explore the sources of emotional discomfort and the coping strategies used by undocumented Mexican migrants living in two states on the East Coast that have hardly been researched due to their relatively recent migration history.

METHOD

Study Design

The present paper is the result of a qualitative study comprising two phases, in each of which different methodological strategies were used. The first involved exploring and describing the contexts in which UMIs lead their everyday lives and contacting key informants, while the second consisted of semi-structured interviews with undocumented Mexican immigrants. The principal investigator (MM) was already familiar with the area since she had previously traveled to Washington DC to participate in other mental health projects and to visit relatives living in Maryland. She is a psychologist by training and a researcher in medical sciences with a master's degree in public health and a doctoral student in public mental health, and introduced herself as such to the study participants. In addition, she has trained as an interviewer in other projects as an interviewer and is qualified to give emotional containment. She conducted the fieldwork from April to August 2019, contacting key informants for the first time during the first two months.

The Context

The study site consisted of two counties located in two states on the East Coast: Maryland and Virginia, which form part of the corridor from Florida to New York that is still in the stage of development as a region of Mexican immigration (CONAPO, 2018). Most undocumented immigrants living in Maryland and Virginia are Salvadoran (30% and 27%) or Mexican (9% and 13%). Maryland County, where the study was conducted, reported 6,000 UMIs (MPI, 2019a) with Virginia reporting 19,000 (MPI, 2019b).

In both counties, the undocumented population is engaged in similar activities, with women working in house cleaning and men in gardening and construction. Both sexes are also often employed in the food sector (restaurants). The places where immigrants meet are small shopping malls serving the Latino population, where Spanish is spoken. There is usually a beauty salon, a laundromat, a place for sending remittances, a Mexican or Salvadoran restaurant, and a grocery store selling meat, vegetables, fruit, bread, and typical products from Mexico and Central America.

Participants

In phase one, four Latina women, two from each county, who were managers or owners of commercial establishments serving the Latino population, served as key informants. They asked potential participants whether the first author (MM) could contact them individually, and whether they preferred her to go to the informant's home or call them by phone (the number of which had been provided by the key informants) to make an appointment and explain the objectives of the study in more detail.

In the second phase, three undocumented Mexican immigrants were contacted and interviewed. After that, they referred four other participants, yielding a final sample of three men and four women. No participant referred by the key informants had an employment relationship with any of them.

The inclusion criteria were (a) being an undocumented Mexican immigrant, (b) being over 18 years old, and (c) providing their informed consent to participate. Table 1 shows their main characteristics.

Data Collection Procedure and Techniques

The first phase included ethnographic techniques, such as participant observation, field notes, and open interviews. MM toured the two study areas on foot. The observations, based on a guide, were designed to record the main places and activities performed by the UMIs at their usual shopping malls and supermarkets, restaurants and bakeries, convenience stores, schools, recreational centers and parks, churches, and community or other types of centers offering health services. At the same time, informal conversations were held with the attendees and managers of these places, and when possible, meetings were attended. This procedure made it possible to establish contact with key informants who had daily contact with and knowledge of the population of interest. After earning their trust, MM paid each of them

Table 1
Characteristics of the participants

Pseudonym	*Nationality*	*Age when arrived in the U.S.*	*Age*	*Years in the U.S.*	*Occupation*
Informant					
Anna	Mexican	18	53	35	Owner of aesthetics
Patricia	Mexican	24	55	30	Bakery owner
Paola	Bolivian	7	45	38	The link between Latino community and a "free" clinic
Isabel	Honduran	17	42	25	Work in a nonprofit organization
Participant					
Adela	Mexican	17	35	15	Housewife
Elena	Mexican	24	44	20	House cleaning (self-employed, has two employees)
Geo	Mexican	22	35	14	Restaurant (part-time)
Rita	Mexican	24	41	17	House cleaning (self-employed)
Víctor	Mexican	25	45	18	Gardening (self-employed, has two employees)
Néstor	Mexican	21	35	14	Installation of floors
Alonso	Mexican	24	35	10	Gardening

two formal visits. In the first one, she briefly explained the study and what their participation would involve, and if they showed interest in the study, a second visit was arranged. During the latter, the letter of consent to which they had verbally agreed was read out. MM explained her interest in exploring the mental health of UMIs living in their county and, in particular, in securing their collaboration for contacting potential Mexican migrants to participate in the interviews.

The second phase involved a semi-structured interview with UMIs using a thematic guide based on the problem statement, research objectives, literature review, and pilot interviews. The axes of exploration of the interviews were emotional discomfort, the primary sources of concern in everyday life as an immigrant, and the strategies used to cope with them.

The place and date of the semi-structured interviews were agreed on with each participant separately. All of them were interviewed in their homes without the presence of other people, in a session lasting 60 to 120 minutes. An informed consent form was read out to them requesting their authorization to participate and for the interviews to be audiotaped. Because of their immigration status and to ensure anonymity, they gave their authorization with a pseudonym. They were assured that report documents or publications would not contain information that could reveal their identity.

At the end of the interview, the interviewees were thanked for their participation and offered a free online session with a Mexican psychologist experienced in working with migrants. Although the participants appreciated the interest and attention given to their stories, the proposed session was optional. Participants did not feel emotionally harmed by the interview and instead were grateful for having been heard.

Analysis

The open-ended interviews with key informants were not transcribed or analyzed. The information collected during this phase was recorded in field diaries and used to triangulate information between discreet observations of everyday life and direct, planned interviews (Denzin & Lincoln, 2000).

MM and another independent transcriber transcribed the recordings. The two of them reviewed the audiotape of each interview, comparing each pair of transcripts to check the consistency of the text obtained and ensure that it could be read as a conversation. Data were analyzed using thematic analysis. This is a method for systematically identifying and organizing information on patterns of meaning and analyzing the subjective meanings of participants (Braun & Clarke, 2012; Flick, 2015) so that it can be used with various theoretical frameworks (Flick, 2015).

For this study, both an inductive and a deductive approach were used. In other words, the topics and codes were first constructed based on the contents of the transcripts of the seven interviewees. These issues were subsequently reviewed, considering emotional discomfort and coping strategies regarding the source of discomfort (regardless of whether they were associated with their undocumented status) (Chaves, 2005). We used the six-phase approach (Braun & Clarke, 2012) recommended to identify the emotional discomfort experienced by these immigrants, the situations to which it was linked, and the strategies employed to cope with it. Three authors of this manuscript (MM, MTS, LRL) individually reviewed each interview and participated in the first and second approaches for the themes identified and to construct categories and subcategories. They subsequently met to discuss them and arrive at a consensus through researcher triangulation (Benavides & Gómez-Restrepo, 2005).

Subcategories that emerged from emotional discomfort and ways of coping with it were considered in regard to the aforementioned subcategories of the source of discomfort, regardless of whether the latter was associated with undocumented status.

Ethical Considerations

This project was evaluated and approved by the Research Ethics Committee of the Ramón de la Fuente National Institute of Psychiatry (CONBIOÉTICA-09-CEI-010-20170316) and subsequently validated by the University of Maryland in Baltimore.

RESULTS

Concerns Affecting Mental Health

From the perspective of the key informants, the concerns of undocumented Mexican migrants affecting their mental health can be divided into two main areas: being separated from their families and the fear and difficulties they experience because of their undocumented status in the United States, particularly the emotional discomfort caused by driving without a license due to the fear of being detained and deported.

As for the migrants themselves, the main emotions related to these stressors and the strategies used to cope with them are described in Table 2.

The Emotional Discomforts of Everyday Life

Relaxing and listening to songs of praise: The sadness and loneliness of the role of caregiver and housewife

The most significant source of discomfort was the burden of child-raising mentioned only by the women, who expressed a series of emotions and sensations associated with sadness, loneliness, and feeling misunderstood. One of them, with four children, described the lack of support she felt from her husband, who works in a nearby city, meaning that they only see each other on weekends, mentioning a degree of hopelessness that has even led her to contemplate suicide:

> *"... When I feel sad, I feel like my husband doesn't even care about me... It just affects me that my husband is not with us... (as he) works far in a different city. So it is as if I was gripped by despair that everything had to be done by me... I know he has to go to work but (I wish that) it was not so far away! From Monday to Friday, he leaves me completely on my own... And then despair gripped me, and I said, 'Ah, what if I killed myself because then all my problems would end'..."* (Adela).

In regard to strategies for dealing with this discomfort, listening to songs of praise (using CDs or cell phone apps) and relaxation activities were reported, such as being alone or looking for spaces without children, which the women mentioned as a means of coping with the burden of parenting and household activities. Since it is difficult for them to achieve this type of space due to the lack of close support networks, this discomfort can often become chronic. All the interviewees mentioned that they would like to have their mother or sisters nearby to help them look after their children.

Praying and crying: feeling unable to cope with financial difficulties

In regard to everyday financial problems, such as insufficient income, another participant remarked that her salary is insufficient to support two children since her ex-husband does not pay alimony:

> *"... (Here in the U.S.) you can't get ahead, you can't save, so that's where your frustration comes from, I mean... that I'm working and working on the same thing and I don't make any progress... So, I sometimes ask myself, why God? Why do I work so much and see no results for my efforts?... With so many expenses! Because what this country gives with one hand it takes away with the other."* (Rita).

In response to this type of stressor, the most common strategy, in addition to crying, is religious strategies such as praying for a divine power to help people advance.

The Emotional Discomfort Associated with Undocumented Status

Praying and crying: The fear of going out and being deported

Fear is the main form of discomfort; all participants feel it when they leave for work or go out, mainly because of the risk of being detained and deported if they commit a traffic offence despite having a driver's license. Immigration and Customs Enforcement (ICE) and the police, in general, are the main sources of their fear. One participant describes this as follows:

> *"... you go out, and honestly you look all around you and, well, are thinking that they are following you or that (...), I do not know, (hoping) that you do not have an accident because they will immediately call ICE or who knows what ... But yes, it affects you because you get up and from the moment you get up ..., you think this, hopefully I'll be alright, and nothing will happen to me and they won't get me out there because I would have to go back.'..."* (Nestor).

Spiritual or religious strategies are often used to cope with the fear of driving and being detained or deported because of their immigration status: entrusting oneself to God and thinking that "if it is going to happen, so be it," "they are going to send me to my country, to a place I know." However, participants with young children did not mention this strategy. The religious activities mentioned by the four participants included praying and attending church.

Table 2
Topics and categories derived from interviews with undocumented immigrants

	Sources of emotional discomfort		
Emotional discomfort	*Daily life*	*Strategies used*	
Sadness, loneliness, hopelessness	Overload with parenting and caring for children	Relaxation Religiosity	Relaxation activities, finding spaces to be alone and listening to praise
Impotence	Economic problems	Religiosity	Asking God for help and crying
	Immigration Status		
Constant fear and fear of being detained or deported, worry, insomnia	Going out to work or going out	Religiosity	Entrusting oneself to God, praying, attending church and crying
Fear and worry	See news about raids	Avoidance	Avoid watching the news, and not going out
To be mad, anger, rage, helplessness	Being a witness or victim of racism and discrimination	Self-control "Aguantarse"	Hold on, stay quiet, crying
Sadness and loneliness	Being away from family	Avoidance	Sleeping and letting the discomfort pass
		Social support	Visiting family, friends, or neighbors

As one participant noted:

> *"... I start to think, not everything God wants to happen happens, does it? Already, if God says that, that's fine. Well, since I used to go to church, now I don't but before I did, I remember a little bit of that, of God, and I pray, or I prefer not to talk to anyone ... Of course, no, I don't want to talk to anyone, I shut myself away, if I have time I shut myself away, I rarely have time to be alone, but if I have time I shut myself away and pray ... like God gives you encouragement... and I calm down, I try to calm down..."* (Adela).

These fears increased when they learned that raids had taken place in their area and were accompanied by insomnia and constant worry. As a result, they focused on social avoidance strategies, such as not watching the news and not leaving home.

Gritting one's teeth and bearing it: Feeling anger and resisting the urge to react to racism and discrimination

The racism and discrimination experienced because of being of Mexican origin or because of their skin color were cited as being both common and taking place on a daily basis, when they went shopping, or were at their children's schools or work. The associated discomfort reported was a mixture of anger and helplessness.

> *"... Racism can cause emotional discomfort... a lot of Americans look at you as if you were a weirdo, you know? That's what can cause you discomfort, you know..."* (Victor).

> *"... We were working, mowing the lawn outside a bank, and at the end, I produced some dust, and (an American) tried to attack me, shouting nasty things at me, telling me that he was going to call the police because we had dirtied his car. He almost hit me, he yelled at me, he came very close, stood next to me and shouted at me (jabbing his finger at me), to leave his country ..."* (Alonso).

Faced with these episodes, participants mainly used self-control strategies, such as gritting their teeth and keeping quiet ("aguantarse"), to avoid problems with the police or at work when they were reported if they defended themselves. However, they added that their immigration status and the fact that they are not proficient in English also leads to a sense of helplessness and anger, as they are unable to cope with these specific situations of discrimination. It is important to note that UMIs cannot change these situations, so the best thing they can do is control themselves and avoid reacting. To ask for respect or, even worse, to shout or do something against the people who engage in these acts of discrimination can lead to jail or deportation.

Avoiding but also looking for social support: The sadness and loneliness due to being away from their families

Another form of discomfort associated with immigration status was the sadness in women due to their loneliness because of being away from their families of origin or in men because of not having a wife and children in the United States. Some participants said that they could count on their neighbors but did not discuss their problems with them. All the women interviewed said that they would like to have their mother or sisters nearby to help them raise their children.

One participant emphasized the feeling of not having someone to help them cope with their loneliness:

> *"... I miss being around family. When I feel lonely (in Mexico), I go to my mom's house, my aunt's house, or I think of somewhere to go, but I go to someone in my family's house. Where am I supposed to go? There is no-one here..."* (Adela).

The use of avoidance strategies such as sleeping and waiting for the feelings of sadness or discomfort to disappear were strategies specifically reported by men for this discomfort. They seek social networks, although not necessarily to talk about their discomfort, but mainly to distract themselves. Women said that they did not trust their neighbors enough to share their personal problems with them. The women reported that they phoned their mothers or relatives in Mexico to tell them about their problems.

Strategies such as self-medication and home remedies were only reported for dealing with physical discomfort. Tylenol, aspirin, and vitamins, the most common types of medication used, are obtained at Latino stores or sent from Mexico with "raiteros" (informal couriers). Four interviewees were from Oaxaca, from the same community of origin, located in the Papaloapan Basin region, and now residing in Maryland. They use the services of the "raitero," who is a transnational resource since he delivers goods between this Oaxacan community and the United States. It would be worth investigating this resource as a possible migration circuit.

As observed, none of the participants mentioned using formal mental health services to deal with emotional discomfort, despite the existence of mobile health services (such as "Mission of Mercy") and low-cost services (such as "Loudoun Free Clinic") observed during the initial phase. In the interviews with UMIs, they argued that they were not accessible due to various barriers, such as their high cost and the need to miss work, which would affect their income. In addition, none of them had health insurance, unlike their US-born children. Men said that mental health care was not something they would consider.

DISCUSSION AND CONCLUSION

The emotional discomfort of Mexican immigrants was mainly associated with being undocumented and comprised distrust and fear of having their legal status discovered and being detained or deported as a result (Garcini et al., 2021; Payan, 2022). It is striking that both subtle acts of discrimination experienced on a daily basis –which can be considered "racial microaggressions" (Sue et al., 2007)– and overtly racist actions were mentioned. The latter targeted their skin color or ethnicity, in other words being/looking Mexican or "Latino."

Following what Garcini et al. (2021) reported, this study found that undocumented immigrants experience many types of discomfort due to constant stressors such as socioeconomic disadvantage, harsh living conditions, demanding work schedules, double shifts, stigma, and discrimination, coupled with anti-immigrant rhetoric, policies and actions that increase distress, fear, and mistrust among undocumented communities (Garcini et al., 2021). Participants not only mentioned specific events but also the constant feeling of insecurity and hypervigilance, due to the permanent threat of raids or being questioned by ICE. This was compounded by the feeling of being overwhelmed and powerless in some cases due to the mistreatment of Mexicans shown on television and social networks (Pinedo et al., 2021).

As noted, the fieldwork was conducted shortly after Donald Trump took office and ended days after a massacre with racist overtones in Texas.[1] In this political context, operations to locate and deport the undocumented increased (Carrasco, 2017; Armendares, 2018; Armendares & Moreno-Brid, 2019), with cases of racial profiling by immigration agencies that resulted in many Latinos being detained and questioned about their citizenship or legal immigration status (Pinedo et al., 2021). All this was accompanied by anti-immigrant, anti-Mexican rhetoric (Garcini et al., 2021; Payan, 2022).

Racist incidents had already been experienced by some participants before the Trump administration, showing that their ethnicity and irregular migrant status put them in vulnerable situations regardless of the government in power. These migrants can therefore be said to experience structural vulnerability since a crucial part of adverse mental health outcomes, in this case, daily emotional discomfort, are not the result of individual or cultural failure but rather of social, political, and economic structures (Cadenas et al., 2021; Garcini et al., 2019), largely due to the aggressive immigration policy and harsh enforcement of laws (Payan, 2022). It is therefore important to note that the strategies of self-control (such as gritting their teeth and bearing it) used by participants to cope with emotional discomfort help them deal with their situation as undocumented migrants, but not to resolve it, since this depends more on a complex socio-political structural system than on their efforts. These coping strategies should not therefore necessarily be considered "passive" or a sign that immigrants assume the role of victims (Abraído-Lanza et al., 2004).

Women reported the stress and discomfort associated with the burden of raising children, in which they perceived a lack of support from their partners and missed having the support of their families of origin. They mentioned relaxation activities to cope with this burden, while "sleeping" and "letting sadness pass" were the strategies reported by men. In his literature review, Payan (2022) reports that distraction (such as engaging in activities to avoid thinking about the problem) is an effective strategy for coping with mental health problems.

Another strategy mentioned by most participants, especially to cope with the fear of driving and being detained or deported because of their immigration status, was to entrust themselves to God and think that "If it is going to happen, so be it." Religious coping refers to specific cognitive acts resulting from the religious beliefs of people who deal with stressors (Tix & Frazier, 1998). As mentioned earlier, these are mechanisms reported to be important to the mental health of undocumented immigrants, particularly Latinos (Campbell et al., 2009; Garcini et al., 2021; Payan, 2022). Given that many aspects of these immigrants' lives are perceived as uncontrollable, it is hardly surprising that they use emotional coping strategies, such as religiosity, if they lack close social support. This may also be related to the more frequent and significant reports of religious coping in women. However, it has been found that Latina and Mexican women tend to use this coping more than non-Latina women (Abraído-Lanza et al., 2004) and Mexican men (Ramos-Lira et al., 2020), respectively.

The lack of social support networks has been identified as the main risk factor for mental health in these populations (Garcini et al., 2021). In addition, limited family support due to being separated from the family of origin has been identified as a factor associated with problems with child-raising, increasing stress (Garcini et al., 2021). In this regard, in general, recent immigrant Mexican women experience more negative consequences on their mental health when they are separated from their families (Arenas et al., 2021).

Since undocumented Mexican migrants in this area do not have a long-standing migratory tradition as they do in other states, there are no migrant groups or community organizations, particularly in the county in Maryland. At the time of the study, collective agency was not observed, unlike in other states where communities of Mexican origin have existed for decades, as in California. However, there is a capacity for individual agency that will probably be transformed and eventually lead to the establishment of an organization.

As expected, striking differences were found between the men and women participating in this study, due to the traditional gender roles adopted by the participants, which seem to determine the way they cope with difficult situations and become sick. Key aspects include the importance of caring for others in women and economic and job stability as an expression of manhood in men (Burin, 1995; Ojeda García et al., 2009).

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[1] A mass shooting occurred at a Walmart in El Paso, Texas, United States, on August 3, 2019, resulting in 23 people being killed and a similar number being injured. The attack was motivated by hatred toward the Latino community and immigrants; most of the dead were Latinos.

What undocumented migrants do to cope with the oppression caused by the enormous power structures legitimized by the United States is to look for the cracks or small spaces where they can move, establish networks with each other, and survive on a day to day basis without necessarily considering obtaining legal residence. The strategies reported work as a band-aid, in other words, a temporary remedy (Sangaramoorthy, 2018), since they fail to address broader long-term needs (Redfield, 2017) requiring public policies.

One limitation of the study is that since it focused on a group of undocumented Mexicans in a specific region of the United States it does not represent this population in general. However, this approach gives an idea of what people with similar immigration status experience daily. Accessing participants was done carefully, prioritizing their safety. Moreover, it was an advantage that the principal investigator was Mexican with Spanish as her first language. The use of ethnographic strategies during fieldwork helped participants feel confident during the interviews. However, some did not delve into their stories, and men especially were unwilling to address issues related to painful emotions.

In short, the best thing would be for migrants living in the United States to access services that meet their needs. Giacco et al. (2014) propose collaboration and information sharing between mental health services and non-medical services, integrating mental health care with physical care and psycho-educational family programs to increase help-seeking and engagement with services in immigrant populations. They also note that technology-based interventions can help support information translation, reach underserved populations, and deliver culturally adapted programs. In this regard, telemedicine could be an option for meeting these mental health needs, including training health personnel in the specific care of the undocumented migrant population. At the same time, it is essential to promote online and in-person social networks in the face of the enormous loneliness these migrants with few mobility options can experience daily both within the United States and on their return to Mexico.

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Conflict of interest

The authors declare they have no conflicts of interest.

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Pilot Feasibility Study of an Individualized Cognitive Rehabilitation Program in Mexican Adults with Mild Dementia

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ABSTRACT

Introduction. Dementia is a global public health problem, for which there is currently no cure. The increasing number of non-pharmacological interventions for the management of dementia challenges us to provide evidence-based care. **Objective.** To evaluate the feasibility of an individualized, cognitive rehabilitation program based on the French ETNA3 trial in Mexican subjects over fifty-five with mild Alzheimer's dementia and their caregivers who live in the community. **Method.** Non-randomized feasibility study. The intervention consisted of a twelve-month cognitive rehabilitation program, divided into eighteen ninety-minute sessions, administered by trained psychologists, and standardized according to the French ETNA3 program. To assess its feasibility, we determined the percentage of eligibility, acceptability, retention, and compliance and evaluated the adverse effects and degree of satisfaction in patients and their caregivers. **Results.** Thirty-two people with dementia and their caregivers agreed to participate. The mean age of the participants was 80 ± 8 years, the majority (72%) were women, and 78% had had five or more years of schooling. At twelve months, twenty-eight subjects (87%) completed the program with 100% compliance with the scheduled sessions. **Discussion.** This study shows the feasibility of an individualized cognitive rehabilitation program based on ETNA3 for Mexican subjects with mild dementia and their caregivers. **Conclusion.** More studies are required to evaluate the importance of trained therapists and caregiver support in achieving significant cognitive and functional changes in patients.

Keywords: Cognitive rehabilitation, mild dementia, reminiscence therapy, elderly adults.

RESUMEN

Introducción. La demencia es un problema mundial de salud pública, actualmente no existe una cura. El creciente número de intervenciones no farmacológicas para el manejo de la demencia nos desafía a brindar atención basada en evidencia. **Objetivo.** Evaluar la factibilidad de llevar a cabo un programa individualizado de rehabilitación cognitiva derivado del ensayo francés ETNA3 en sujetos mexicanos mayores de 55 años con demencia leve tipo Alzheimer y sus cuidadores que viven en la comunidad. **Método.** Estudio de factibilidad no aleatorizado, la intervención consistió en un programa de rehabilitación cognitiva de 12 meses, distribuido en 18 sesiones de 90 minutos, fue administrado por psicólogos capacitados y estandarizados en base al programa francés ETNA3. Para evaluar la factibilidad se determinó el porcentaje de elegibilidad, aceptabilidad, retención y cumplimiento, se evaluaron los efectos adversos y el grado de satisfacción en los pacientes y sus cuidadores. **Resultados.** Aceptaron participar 32 personas con demencia y sus cuidadores, la edad media de los participantes fue 80 ± 8 años, la mayoría (72%) eran mujeres y el 78% tenían 5 o más años de escolaridad. A los 12 meses, 28 sujetos (87%) completaron el programa con 100% de cumplimiento a las sesiones programadas. **Discusión.** Este estudio muestra la factibilidad de un programa de rehabilitación cognitiva individualizado basado en ETNA3 en sujetos mexicanos con demencia leve y sus cuidadores. **Conclusiones.** Se necesitan más estudios que evalúen la importancia de terapeutas capacitados y del apoyo de cuidadores para lograr cambios cognitivos y funcionales significativos en los pacientes.

Palabras clave: Rehabilitación cognitiva, demencia leve, terapia de reminiscencia, adultos mayores.

INTRODUCTION

Dementia is a global public health problem affecting approximately fifty-five million people. Due to the aging population, this figure is expected to rise to 152 million by 2050 (Nichols et al., 2022). Alzheimer's disease (AD), a neurodegenerative disorder characterized by progressive memory deficits and disability, is the leading dementia sub-type (DeTure & Dickson, 2019), for which there is currently no cure. In addition to vascular prevention, the current pharmacological approach involves FDA-approved symptomatic therapy that provides limited long-term benefits (Alzheimer's Association, 2016). Approximately 80% of those with cognitive impairment will experience the behavioral and psychological symptoms of dementia at some stage of the disease (Lyketsos et al., 2002). Both dementia patients and their caregivers can benefit from adequate symptom management.

Several non-pharmacological interventions have been proposed to manage neuropsychiatric symptoms and even improve cognitive function to improve the quality of life of patients and caregivers (Livingston et al., 2014). Three types of non-pharmacological cognitive interventions have been developed to improve cognitive functioning in people with dementia. Cognitive stimulation involves non-specific exercises, tasks, and activities such as word games and brain teasers focused on cognitive and social functioning reinforcement (Berg-Weger & Stewart, 2017). Reminiscence therapy in people with dementia, using photographs and everyday items such as music and movies, encourages participants to talk about past experiences and memories, promoting skill retention and mood improvement (Huang et al., 2015). Cognitive training seeks to maintain or improve a particular aspect of cognitive functioning (such as memory or attention) through structured, guided practice provided individually or in a group (Bahar-Fuchs et al., 2013). Cognitive rehabilitation is an individualized intervention focused on a person's needs and includes models that help slow down cognitive decline. Minimizing mental decline also involves using strategies to find, learn, and practice compensation techniques (Choi & Twamley, 2013). Individuals with cognitive impairment and therapists usually work together to achieve key goals (Wilson, 2002). However, a systematic review has confirmed that a single intervention implemented in a group setting does not suffice to meet all a patient's needs. Each person with dementia must be individually assessed and treated accordingly (Meyer & O'Keefe, 2018). Ideally, clinical interventions, often achieved through collaboration between the patient and a close family member, must be tailored to the individual's priorities, needs, and preferences. Individualized intervention is characterized by being delivered by the same trained therapist who knows the diagnosis, stage, and individual characteristics of the person receiving the intervention.

Non-pharmacological interventional studies are characterized by distinct levels of evidence and heterogeneous methodologies. The authors of a literature review stated that these programs were at best comparable to traditional care (Petriwskyj et al., 2016). To our knowledge, there is only one randomized controlled trial (RCT) of individualized cognitive rehabilitation, involving both a person-centered approach and high-quality evidence targets. The Efficacy Assessment of Three Non-Pharmacological Therapies in Alzheimer's Disease (ETNA3) Trial compared the impact of cognitive training, reminiscence therapy in group sessions, and an individualized cognitive rehabilitation program with individualized sessions on the rate of progression of dementia. A two-year follow-up analysis of the 653 AD outpatients who received the latter intervention reported no impact on primary efficacy measures (moderately severe to severe dementia-free survival rates). Moreover, none of the secondary outcomes (such as impairment, functional disability, behavioral disturbance, quality of life, depression, caregiver burden, and resource use) involving group session interventions differed from those of usual care. However, with an individualized cognitive rehabilitation program, reduced functional disability, and a six-month institutionalization delay at two-year follow-up were observed (Amieva et al., 2016).

Given this evidence, it is essential to determine whether these practices are applicable in settings outside clinical research and in other sociocultural contexts. Countries in Latin America have different resources, cultural and historical features, ethnicities, socioeconomic disparities, and health and economic systems (Aravena et al., 2022). The main objective of this study was therefore to evaluate the feasibility, acceptability, retention, adherence, and satisfaction rates of an individualized cognitive rehabilitation program based on the French ETNA3 study, administered to mild dementia outpatients at a memory clinic in Mexico City.

METHOD

Participants and setting

We conducted a single-arm clinical trial at the memory clinic of a tertiary-level hospital in Mexico City with non-institutionalized subjects over fifty-five years of age with a diagnosis of mild Alzheimer's disease (AD). The same evaluator (a certified geriatrician or neurologist) performed a clinical and cognitive evaluation using the NINCDS ADRDA (McKhann et al., 2011) and the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria to determine possible or probable AD (Sachdev et al., 2014), whether the person had a caregiver (someone who has contact with the subjects for at least ten hours a week), and the absence of uncontrolled and/or concomitant depression or vascular dementia.

Exclusion criteria included subjects who were unable to read or write, had major depression on the Geriatric Depression Scale, (GDS) > or equal to 6 points, a Hachinski 7 single-item scale score > 2 (2 or more indicates a vascular component of cognitive impairment) (Hachinski et al., 2012), with poor chronic disease control (such as heart disease, hypertension, lung disease, liver disease, cancer, and diabetes) or altered vitamin B12 or vitamin D levels.

Since this was an exploratory feasibility study, no sample size calculation was performed, with researchers simply recruiting patients who met the inclusion criteria and agreed to participate in the period from December 2018 to February 2019.

Recruitment

To determine eligibility, researchers reviewed subjects' records at the memory clinic. Subjects who met the inclusion and exclusion criteria were subsequently contacted via telephone to receive an explanation of the study's characteristics and an invitation to participate. If a person was interested, we scheduled an appointment to confirm their eligibility

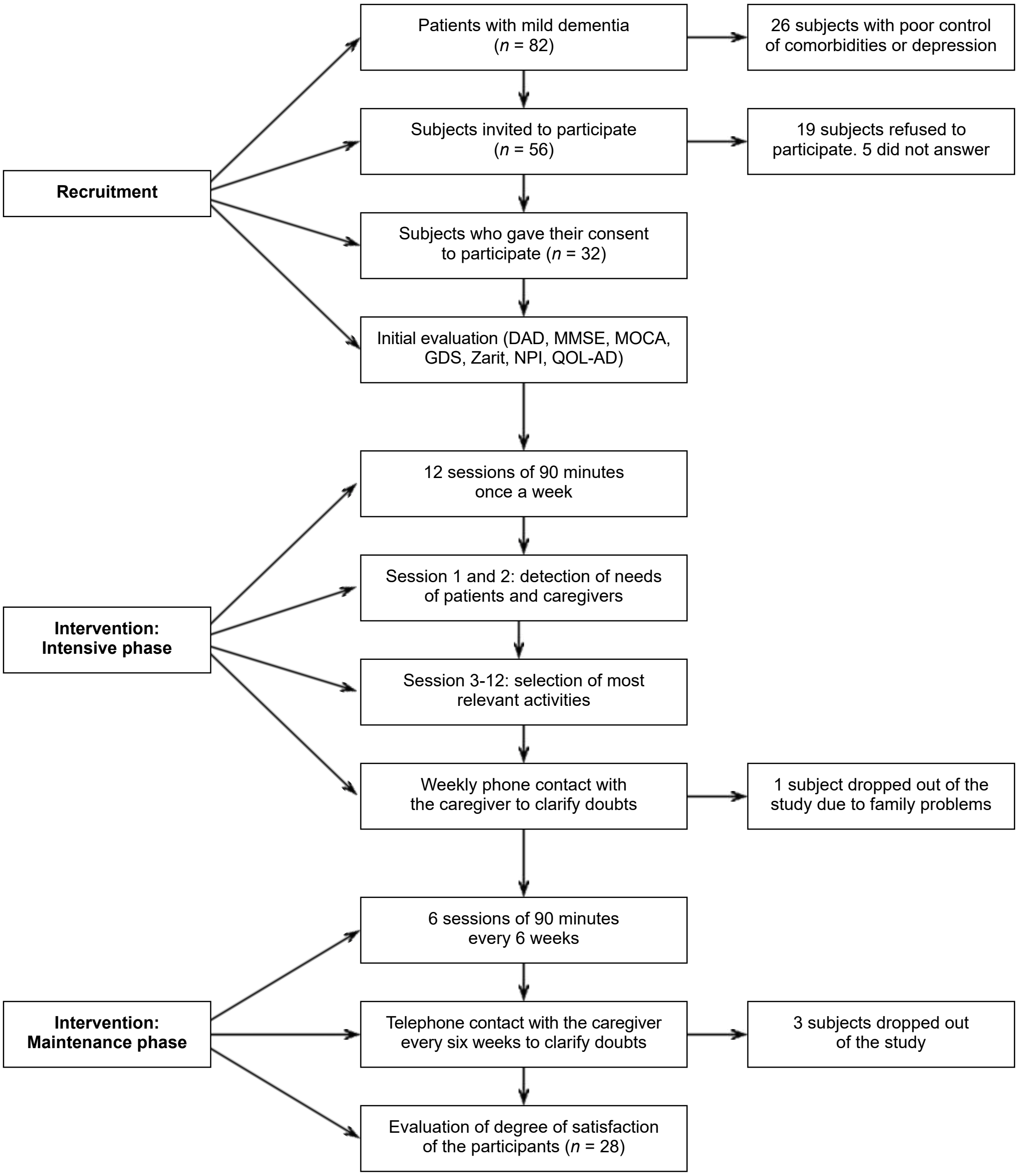

Figure 1. Overview of the study protocol.

and ask further questions. Both the subject and caregiver gave their informed consent in writing. The local Ethics Committee approved this protocol.

Figure 1 provides a summary of the protocol followed for recruitment. Eighty-two subjects with mild dementia were initially identified. After a review performed by researchers at the memory clinic for eligibility criteria, only fifty-six were invited to participate. Finally, thirty-two subjects and their caregivers gave their written consent.

Intervention

The intervention process followed a standardized procedure to guarantee homogeneity. Three psychologists with experience in the field of dementia were recruited. They received a three-day training program taught by ETNA3 study staff (Amieva et al., 2016). A detailed explanation of the rehabilitation plan and a manual specifying the intervention guidelines were provided. Monthly supervision sessions were also conducted during the study.

The cognitive rehabilitation program consisted of ninety-minute sessions. As shown in Figure 1, during the first three months, these sessions were scheduled weekly (intensive phase), while maintenance sessions were held every six weeks for the following nine months. All evaluations were performed in a doctor's office by the same psychologist originally assigned to each patient.

The cognitive rehabilitation therapy consisted of a program conducted through individual sessions (with the subject and caregiver). The psychologist(s) asked the patient to choose the therapy for each day, after considering their clinical characteristics, including sociodemographic factors, severity of the disease and cognitive and behavioral alterations. In the first two sessions, the following were explored with the patient and their caregiver: the activities (hobbies or crafts) the patient used to enjoy and had stopped doing; the patient's interest in recovering and talking about their life story, from their oldest memories (childhood) to their current ones (reminiscence therapy). It was agreed that the material required to perform each activity would be provided by the patient and their caregiver (such as photographs, sewing materials, and books). The first two sessions were dedicated to selecting tasks related to leisure or daily activities according to the personal objectives and cognitive abilities of each subject. In both therapies, we emphasized the engaging in everyday activities to find strengths that would compensate for deterioration, such as tasks that involve learning information. (such as lists of words, stories, and figures) and the discussion of past activities, events, and experiences enhanced by items such as photographs, familiar items, songs, and personal recordings (Amieva et al., NCT00646269). In the following sessions involving individualized therapy, the patient decided what to do in each session: cognitive therapy or reminiscence.

Case examples

Case 1: A seventy-nine-year-old housewife, who compulsively washed clothes even though they were clean, all day every day. She had previously enjoyed embroidery, “but I don´t know how to do it anymore.” She chose cognitive therapy and brought in her unfinished embroidery material. We began to work by trial and error, emphasizing successes and downplaying mistakes. At the same time, we remembered the names of stitches, threads, and lace. The woman stopped washing clothes and began to spend her time embroidering. *Case 2*. An eighty-five-year-old man, previously engaged in public activity with a large support network for agenda management. Although his main interest had been social activities, he now lived in a state of anhedonia and apathy. Since he had no interest in cognitive activities, he chose reminiscence therapy. We began by talking about his career using positive material obtained from the web. The caregiver provided photographs from his childhood, youth, and adulthood, facilitating the intervention. We also used music and artwork from the Web. His family started to become involved and he began to participate more.

During the first three months, the psychologists contacted the caregivers weekly, urging them to ask questions about the intervention and encouraging them to mention any particular difficulties. They were subsequently called every six weeks during the maintenance phase of the program.

Subjects' demographics (age, sex, education level, occupation, perceived financial status, subjective health status, relationship with caregiver, and living situation) and comorbidities were recorded at baseline. Their cognitive status was evaluated using the Mini-Mental State Examination (MMSE) (Folstein et al., 1975) and the Montreal Cognitive Assessment (MoCA-S) (Aguilar-Navarro et al., 2018). Behavioral symptoms were evaluated using the Neuropsychiatric Inventory (NPI) (Cummings et al., 1994), depressive symptoms using the Geriatric Depression Scale (GDS), (Yesavage et al., 1982), functional capacity with the Disability Assessment for Dementia (DAD), (Gélinas et al., 1999), and quality of life through Quality of Life in Alzheimer´s Disease (QoL-AD) (Logsdon & Teri, 2018), while the caregiver burden was assessed with The Zarit Burden Interview (Zarit et al., 1986).

Feasibility and Acceptability Evaluation

Feasibility was determined by evaluating the eligibility, acceptability, retention, adherence, and tracking rates of the method. We also evaluated the number of adverse effects and degree of satisfaction. These parameters are described below:

- Eligibility rate: Calculated by dividing the number of people diagnosed with mild Alzheimer's dementia at the memory clinic by the number of subjects meeting the inclusion criteria.

- Acceptability rate: Calculated by dividing the number of people who gave their written consent to participate in the study by the number of subjects diagnosed with AD who met the inclusion criteria and were invited to participate.
- Retention rate: Defined as the number of people who remained in the study, in other words, the number of participants who did not drop out of the study divided by the total number of participants recruited.
- Adherence rate: Measured by adding the total number of intervention sessions received by participants divided by the total number of sessions scheduled for the participants included (eighteen sessions for each subject).
- Adverse events: Researchers recorded any adverse events perceived by participants during the intervention, such as emotional distress, acts of aggression during sessions, or changes in emotional functioning.
- Satisfaction: Assessed in subjects and their caregivers through a six-item questionnaire on their participation in the study, the information provided, the availability of the researchers, activities conducted in the sessions, frequency of sessions, and logistical organization rated on a Likert-type scale ranging from one (not at all satisfied) to seven (Totally satisfied). The minimum score was six points, and the maximum score forty-two.

The study was feasible if the rates had a value of over 50%, as in those reported in previous studies (Orsmond & Cohn, 2015).

Program effectiveness

Evaluations were conducted at two moments: at baseline and twelve months (at the end of the maintenance phase).

Cognitive status was assessed using the Mini-Mental State Examination (MMSE) and the Montreal Cognitive Assessment (MOCA) (Folstein et al., 1975; Freitas et al, 2013). Behavioral symptoms were evaluated using the Neuropsychiatric Inventory (NPI) (Cummings et al., 1994), depressive symptoms using the Geriatric Depression Scale (GDS) (Yesavage et al., 1982), functional capacity using the Disability Assessment for Dementia (DAD) (Gélinas et al., 1999), quality of life using the Quality of Life in Alzheimer's Disease (QoL-AD) (Logsdon & Teri, 2018), and caregiver burden using The Zarit Burden Interview (Zarit et al., 1986) at these two points in time.

Data analysis

Categorical variables were described as numbers and proportions, and continuous variables as means, standard deviations (SD), and ranges. We determined the rates of eligibility, acceptability, retention, and adherence, as well as the adverse effects and the subject's degree of satisfaction. We performed a correlation analysis to establish an association between the demographic and clinical variables and the feasibility values (number of sessions and assessments completed) with Spearman's rho test.

Using the Shapiro-Wilk test, we found that the variables did not have a normal distribution. For comparisons before and after the cognitive rehabilitation program (at baseline and twelve months), we used raw scores for all analyses and the Wilcoxon nonparametric test (Dexter, 2013). The effect of the intervention was also based on case studies. Individual scores were plotted for each participant's comparison between baseline and twelve months to visually compare the distribution of results among participants who completed the program, allowing for person-based assessment. Global scores were calculated for each questionnaire and subscale (DAD, MoCA, MMSE). Field notes were collected at the end of each visit and after telephone conversations to record participants' experience with the protocol and any feedback. The efficacy of the intervention and feasibility of the protocol and intervention were evaluated based on the case studies (Blampied, 1999; Thomas, 2011).

The statistical analyses were performed using SPSS *vs.* 25.

Ethical considerations

This study protocol was reviewed and approved by the local Ethics Committee of the Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán, (INCMNSZ), approval number [NER-2465]. For this study, both the subjects (or their parent/legal guardian/next of kin) and their caregivers gave their informed consent in writing.

RESULTS

A total of thirty-two persons living with a major neurocognitive disorder and their caregivers agreed to participate. Table 1 shows the baseline characteristics of the participants. The mean age was 80.03 ± 7.8 years, 72% were women, 78% had completed five or more years of education, and 22% were still working. Twelve subjects were widowed (37.5%), and ten married (31.2%). Most of the caregivers were either offspring (50%) or spouses (25%). Twenty-one participants lived with their caregivers (65.6%). Most of the participants reported good to excellent health (93.7%). The most frequent comorbidity was corrected visual deficit (87.5%), followed by hypertension (62.5%) (Table 1).

At baseline, the mean score for the scales of MMSE was 21.3. ± 4.3 points, MoCA 14.38 ± 5.3 points, DAD 28.9 ± 5.4 points, Zarit 22.6 ± 13.2 points, NPI 17.94 ± 12,9 points, Qol-AD 36.5 ± 5.07 points, and GDS scale 2.28 ±

Table 1
Participants' baseline characteristics

Variables	*N = 32*
Age, median (min – max)	79.0; (56 – 93)
Female, *n* (%)	23 (71.9)
Years of education, *n* (%)	
No education	1 (3.1)
1 - 4	6 (18.8)
5 - 9	11 (34.4)
10 +	14 (43.8)
Occupation, *n* (%)	
Housewife/man	25 (78.1)
Employed	3 (9.4)
Farmer	1 (3.1)
Other	3 (9.4)
Caregiver, *n* (%)	
Spouse	8 (25)
Child	16 (50)
Grandchild	1 (3.1)
Friend	0 (0)
Other	7 (21.9)
Lives with his/her caregiver, *n* (%)	21 (65.6)
Perceived economic situation, *n* (%)	
Excellent	4 (12.5)
Very good	4 (12.5)
Good	23 (71.9)
Bad	1 (3.1)
Very bad	0 (0)
Living situation, *n* (%)	
Married	10 (31.2)
Divorced or separated	7 (21.9)
Alone	3 (9.4)
Widowed	12 (37.5)
Common-law union	0 (0)
Subjective health, *n* (%)	
Excellent	5 (15.6)
Very good	6 (18.8)
Good	19 (59.4)
Bad	2(6.2)
Very bad	0 (0)
Comorbidities, *n* (%)	
Diabetes	10 (31.2)
Hypertension	20 (62.5)
Hypercholesterolemia	10 (31.2)
Hypothyroidism	6 (18.8)
Depression	7 (21.9)
Visual impairment	28 (87.5)
Hearing impairment	12 (37.5)
Other	21 (65.6)
Initial Evaluation	
MMSE score $\bar{X}$ (SD); (min-max)	21.31 (4.32); (16-28)
Functional abilities (DAD score) $\bar{X}$ (SD); (min-max)	28.91 (5.47); (17-38)
Caregiver´s burden (Zarit score) $\bar{X}$ (SD); (min-max)	22.62 (13.29); (0-45)
Behavioral symptoms (NPI total score) SD); $\bar{X}$ (min-max)	17.94 (12.99); 0-43)
Quality of life (QoL-AD) $\bar{X}$ (SD); (min-max)	36.50 (5.07); 25-47
Depressive symptoms (GDS score) $\bar{X}$ (SD); (min-max)	2.28 (1.78); (0-6)

Note: MMSE: Mini-Mental State Examination, MoCA: Montreal Cognitive Assessment, NPI: Neuropsychiatric Inventory, GDS: Geriatric Depression Scale, DAD: Disability Assessment for Dementia, QoL-AD: Quality of life in Alzheimer´s Disease, Zarit: The Zarit Burden Interview. SD: Standard deviation.

1.7 points respectively. Of the 28 participants who completed the study, 15 (53%) of the total number of participants showed overall cognitive improvement, (MMSE and MoCA), with seven (25%) participants improving their independence in basic and instrumental activities on the daily activities scales (DAD). However, this did not achieve statistically significant levels (Figure 2).

Of the eighty-two cases with AD discussed at the memory clinic, fifty-six met the inclusion criteria and were contacted. The calculated eligibility rate was 68%.

The acceptability rate was 57%. Of the fifty-six subjects contacted, thirty-two agreed to participate (57%), nineteen declined (34%), and five did not respond (9%).

The retention rate was 87.5%, with 32 subjects entering the study. Four subjects withdrew from the study for various reasons (health issues, the caregiver could not take the subject to the sessions, family problems, and loss of follow-up). In the correlation analysis, a lower initial score on the GDS was associated with a higher retention level. The adherence rate of the twenty-eight subjects who remained in the study was 100%. We planned eighteen sessions for each subject included, providing five hundred and four sessions, some of which were rescheduled due to logistical difficulties or health issues. The caregivers remained highly engaged throughout the program and responded to scheduled follow-up calls. A low negative correlation was observed between baseline behavioral symptom scores and level of adherence, although this was not statistically significant (Table 2).

Subjects or caregivers reported no adverse effects during the intervention.

The mean score on the satisfaction questionnaire for the 28 subjects with dementia who completed the study was 39.7 ± 8 points (representing 94.7% satisfaction) and 40.7 ± 2.2 points for the caregivers (representing 97.1% satisfaction).

Table 3 presents the mean for each outcome measure before and after treatment. Wilcoxon tests revealed no significant differences in measures of cognition (p = .414), quality of life (p = .189), depression symptoms (p = .28), or neuropsychiatric symptoms (p = .421). A lower caregiver burden score was observed, however, which was significant (p = .049).

DISCUSSION

Feasibility studies can help researchers predict whether a future trial is likely to be productive. This study determined the feasibility of an individualized cognitive rehabilitation program derived from the French ETNA3 study at baseline and 12 months. A previous review of studies conducted in Latin America has reported similar barriers to this study: the cultural assumption that the families of people with dementia should care for them, meaning that their needs are overlooked (Aravena, 2022). Resources vary widely, since in Mexico, there are limited funds and human resources to

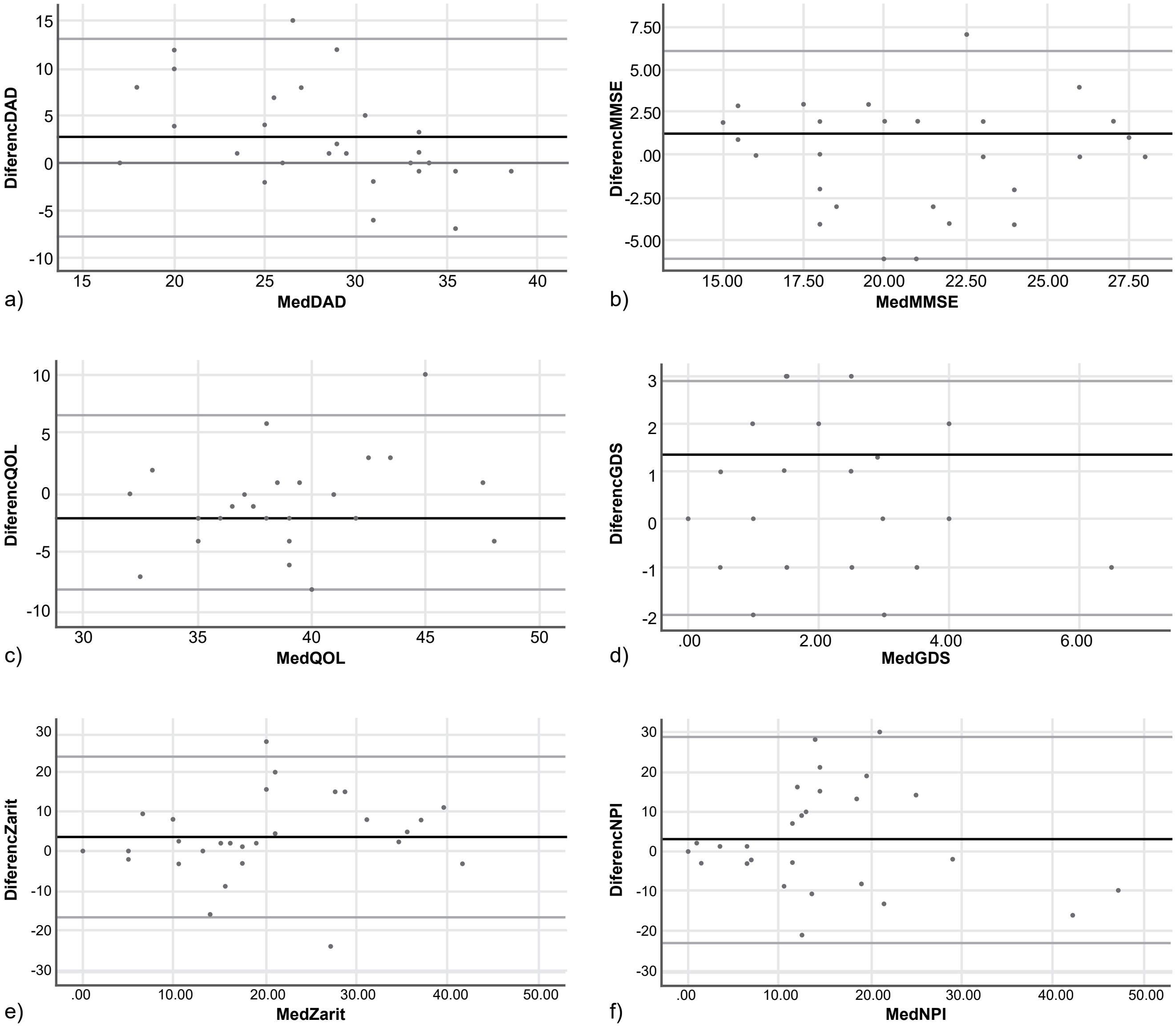

Figure 2. Bland-Altman plots comparing DAD (a), MMSE (b), QOL-AD (c), GDS (d), Zarit (e), and NPI (f) scale scores between at baseline and at 12 months evaluation. DAD: The Disability Assessment for Dementia. MMSE: Mini-Mental State Examination. QOL-AD: Quality of life in Alzheimer´s Disease. GDS: Geriatric Depression Scale. NPI: Neuropsychiatric Inventory.

Table 2

Correlation between baseline characteristics of the subjects and caregivers with the level of retention and the level of adherence

	Level of Retention		*Level of Adherence*	
	Spearman´s Rho value	*p value*	*Spearman´s Rho value*	*p value*
Age at inclusion	.158	.388	.092	.616
Years of education	-.112	.542	.006	.975
Perceived economic situation	-.108	.558	.058	.751
MMSE score	-.068	.712	-.053	.774
GDS score	-.455	.009	-.153	.402
Time spent on care	-.335	.061	-.138	.452
Zarit score	-.221	.225	-.210	.249
NPI score	-.284	.116	-.307	.087

Table 3
Differences in scores before and after the intervention

	Pre-Intervention evaluation Mean (SD)	*Post-Intervention evaluation Mean (SD)*	*p value*
MMSE score	21.31 (4.32)	21.14 (4.18)	.844
DAD score	28.91 (5.46)	26.71 (7.35)	.082
Quality of life (QOL-AD)	37.88 (5.17)	34.64 (5.81)	.189
GDS score	2.28 (1.78)	1.68 (1.67)	.280
Zarit score	22.63 (13.29)	18.18 (11.46)	.049
NPI score	17.94 (12.99)	13.54 (13.33)	.421

be able to replicate studies. There is a low rate of diagnosis of dementia in its early stages compared to developed countries as it is considered a normal aging process due to the low level of information on AD, even among the relatives and caregivers of patients with dementia, with treatment focusing on pharmacological measures. In Latin America, the diagnosis is usually made by specialists and only occasionally by a general practitioner (GP), in contrast to European countries, where most patients are diagnosed by a GP (Nitrini, 2020).

In this study, the eligibility rate was 68%, and causes of exclusion were poor control of chronic diseases, concomitant vascular dementia, and depression, reflecting the high degree of comorbidity in the Mexican population, which could play a confounding role in the lack of response to non-pharmacological treatment of dementia.

The study acceptance rate was 57.1%. Understanding the reasons for non-participation in interventional studies is essential because information obtained through these assessments can improve consent rates in future studies. Similar recruitment rates of 49.2% have been reported in previous behavioral trials involving patients and a support person (Trivedi et al., 2013). The most common reasons for not giving consent for physical activity programs are pre-existing medical conditions and lack of interest (Hubbard et al., 2016). Recruiting dyads poses a challenge because both subjects (patient and caregiver) must meet the eligibility criteria and be willing to participate in the sessions planned throughout the trial. A major challenge is encouraging eligible subjects to participate in the study and maintaining engagement in the activities due to the presence and severity of pre-existing diseases, the lack of awareness concerning non-pharmacological interventions, and the existence of misconceptions regarding the value of treatment programs with low expectations of success (Clare et al., 2004; Wigfield & Eccles, 2000).

Participants' level of adherence is an essential component of successful interventional programs, which not only involve training subjects and educational sessions but also the involvement of caregivers and family support systems. Moreover, for cognitive rehabilitation to be attractive and practical, participants' feelings of self-competence and self-efficacy must be enhanced. These patients could benefit from cognitive behavioral therapy targeting feelings of hopelessness and low expectations of success. In this study, the adherence rate was 100%, which is higher than the average reported in previous studies (Trivedi et al., 2013). This suggests that subjects remained highly involved throughout the study, due to the close support of their caregivers, who provided a basic level of stimulation. In our research, in addition to educating caregivers about neurocognitive disorders, it was also essential to encourage them to answer questions or share experiences with their patients or each other. This was done at the end of each of the sessions individually. Subjects who dropped out of the study had more behavioral symptoms, which could have contributed to differences between participants and caregivers and prevented them from continuing with the study. It has previously been reported that, together with the self-perception of worsening health and longer care time, dropout rates are associated with the physical and psychological problems of caregivers, which could prevent them from taking the person with dementia to the center for rehabilitation sessions (Custodio et al., 2014). More depression symptoms were observed among subjects who failed to complete the planned sessions, as has been reported in studies of predictors of treatment adherence (Gebrie & Ford., 2019).

In this study, although no statistically significant differences were achieved in the overall cognitive evaluation due to the statistical power of the sample, some individual changes of improvement are observed in the case-by-case study, with stability in the mean scores at twelve months. The neural mechanisms underlying the positive influence of non-pharmacological treatment remain unclear. Enhanced brain plasticity, the brain's ability to restructure itself in response to stressors, may be an essential component of the mechanism responsible for the cognitive improvements associated with rehabilitation interventions. In one study, serum brain-derived neurotrophic factor (BDNF) levels increased in the intervention group compared to basal conditions, which was also related to cognitive improvements (Jeong et al., 2016). The latter results suggest that functional deficits could be offset by improving the efficiency of the neural network (Shigihara et al., 2020).

In this study, a significant decrease in caregiver burden was observed, suggesting that caregivers feel less tired helping their patients, together with a decrease in behavioral symptoms that was not statistically significant (Kurth et al., 2021).

Despite potential side effects, drug treatments dominate the dementia treatment landscape. In particular, antipsychotics are associated with an increased risk of stroke and death (Ralph & Espinet, 2018). The efficacy of non-pharmacological therapy in improving cognition or slowing down the progression of cognitive decline has been confirmed, which is why non-pharmacological therapy constitutes a potentially effective complementary treatment for dementia (Wang et al., 2020).

Since the evolution of neurocognitive disorders is heterogeneous, treatment approaches must be individually tailored. Interventions should ideally be designed for both patients and their family environment. The individualized intervention derived from the ETNA3 study used in this research paper allowed the tasks to be constantly updated by the trainers, who always focused on patients' needs. This work encourages health professionals to consider their patients' needs and preferences for building person-centered care based on best practices. However, this interventional rehabilitation program requires the presence of expert specialists to direct and personalize the treatment sessions. The small number of specialists assigned to meet the steadily increasing demand on the part of patients has forced them to opt for group interventions, reducing treatment effectiveness.

Our study has certain limitations: 1) The study was conducted at a single center, meaning that the characteristics of the population may not be representative of the entire Mexican population with AD. 2) This program requires trained personnel to conduct the sessions and needs committed caregivers to accompany and stimulate the patient during the various stages of the disease. 3) The post-treatment evaluations of the outcomes of the program did not observe statistically significant differences, due to the sample size and the fact that the program had to be interrupted due to the health emergency caused by Covid-19.

The strengths of our study include follow-up for an extended period (twelve months) focusing on each patient's specific needs and those of their caregivers. This study was an evidence-based intervention.

CONCLUSION

This study describes the feasibility and acceptability of a personalized intervention program based on the ETNA 3 study in Mexican subjects with mild dementia and their caregivers. Although the sample size did not yield positive results concerning the effectiveness of the intervention, several subjects reported improved cognition and function. Additional trials that consider the need for trained therapists and caregiver support to achieve tangible cognitive and functional changes are warranted.

Funding

None.

Conflict of interest

The authors have no conflicts of interest to declare.

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Author contributions

S.G.A.N and M.G.I.P.H participated in drafting the manuscript, and the analysis, and interpretation of the data and literature review for content. C.O. participated in the conception and design of the study, and the acquisition, analysis, and interpretation of the data. G.G.L.A. participated in the conception and design of the study, and the data acquisition, analysis, and interpretation. M.A.A.J participated in the critical review of the content and the final approval of the version to be published.
All the authors have read and accepted the published version of the manuscript.

Data availability

Technical appendix, statistical code, and dataset are available at the Dryad repository.

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Factors Associated with Interpersonal Violence and Depression Symptoms in Adolescent Students from Jalisco during the COVID-19 Pandemic

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ABSTRACT

Introduction. Violence is a major public health problem, which increased during the Covid-19 pandemic, affecting the physical and mental development of adolescents. **Objective.** To analyze factors associated with interpersonal violence and depressive symptoms in adolescent students in the south of Jalisco. **Methods.** Data were drawn from an online survey of 3,046 adolescents (ages 12-19) conducted between September and December 2021. The Beck Depression Inventory was used to assess depression symptoms. Self-reports of neglect, physical, psychological, sexual, and digital violence in the previous 12 months were analyzed. Bivariate and multivariate logistic regression models explored factors associated with depression and violence. **Results.** A total of 28.8% of the sample reported depression symptoms, 46.9% physical violence, 42.7% psychological violence, 34.9% neglect, 12.3% digital violence, and 5.2% sexual violence. The odds of depression were higher for those who had experienced physical violence (adjusted odds ratio [aOR] = 1.3 CI 95% [1.1-1.6]), psychological violence (aOR = 4.1 CI 95% [3.4-5.1]), digital violence (aOR = 2.0 CI 95% [1.5-2.5]); and neglect (aOR = 1.6 CI 95% [1.3-1.9]). Girls and adolescents aged 15-19 had higher odds of experiencing sexual, digital, and psychological violence. Poor school performance was associated with lower odds of reporting neglect (aOR = .6 CI 95% [.5-.8]) and sexual violence (aOR = .5 CI 95% [.3-.8]), while being employed was associated with reporting higher odds of physical violence (aOR = 1.5 CI 95% [1.3-1.8]) and neglect (aOR = 1.3 CI 95% [1.1-1.5]). Greater use of social media and videogames was associated with higher odds of physical, psychological, and digital violence. **Conclusion.** It is necessary to implement comprehensive public programs and policies to address violence and implement intersectoral social intervention strategies in mental health.

Keywords: Adolescent, depression, violence, COVID-19.

RESUMEN

Introducción. La violencia es un problema de salud pública de gran magnitud, que aumentó durante la pandemia de Covid-19 y tiene consecuencias en el desarrollo físico y mental de los adolescentes. **Objetivo.** Analizar factores asociados de violencia interpersonal y síntomas depresivos en estudiantes adolescentes del Sur de Jalisco. **Métodos.** Datos provienen de una encuesta en línea entre 3,046 adolescentes (de 12 a 19 años) realizada entre septiembre y diciembre de 2021. Se utilizó el Inventario de Beck para evaluar los síntomas depresivos. Se midieron autorreporte de negligencia, violencia física, psicológica, sexual y digital en los últimos 12 meses. Los modelos de regresión logística bivariados y multivariados exploraron factores asociados con depresión y violencia. **Resultados.** El 28.8% de la muestra refirió síntomas depresivos, 46.9% violencia física, 42.7% violencia psicológica, 34.9% negligencia; 12.3% violencia digital y 5.2% violencia sexual. Las probabilidades de depresión fueron mayores para aquellos que experimentaron violencia física (Razón de Momios ajustado [RMa] = 1.3 IC 95% [1.1-1.6]), psicológica y (RMa = 4.1 IC 95% [3.4-5.1]), violencia digital (RMa = 2.0 IC 95% [1.5-2.5]); y negligencia (RMa = 1.6 IC 95% [1.3-1.9]). Ser mujer y adolescentes de 15 a 19 años tuvieron mayores probabilidades de sufrir violencia sexual, digital y psicológica. El bajo rendimiento escolar se asoció con menores probabilidades de informar negligencia (RMa = .6 IC 95% [.5-.8]) y violencia sexual (RMa = .5 IC 95% [.3-.8]), mientras que estar empleado se asoció con mayores probabilidades de violencia física (RMa = 1.5 IC 95% [1.3-1.8]) y negligencia (RMa = 1.3 IC 95% [1.1-1.5]). Un mayor uso de redes sociales y videojuegos se asoció con mayores probabilidades de violencia física, psicológica y digital. **Conclusión.** Es necesario implementar programas y políticas públicas integrales que aborden la violencia e implementar estrategias intersectoriales de intervención social en salud mental.

Palabras claves: Adolescente, depresión, violencia, COVID-19.

INTRODUCTION

Violence is a global public health problem with consequences for the physical and mental development of those exposed to it. Adolescents exposed to contextual violence tend to experience challenges in their individual development such as interpersonal and social relationships, due to its physical and mental implications (Martín del Campo-Ríos & Cruz-Torres, 2020; Organización Mundial de la Salud, 2006). In addition, interpersonal violence at the family level can manifest through physical, sexual, and psychological violence, and neglect, (Organización Mundial de la Salud, 2006), also affecting the development of adolescents. Adolescents exposed to any of these types of violence tend to drop out of school, exhibit problematic behaviors, engage in substance use, and are at a higher risk of developing a wide array of mental disorders (Noriega Ruiz & Noriega Saravia, 2021). Recently, violence exerted through digital social media has been associated with depression, suicide and other mental health conditions among adolescents (Álvarez Gutiérrez & Castillo Koschnick, 2019).

As a result of COVID-19, an increase in intrafamily violence was reported, especially towards women, children and adolescents (Marques et al., 2020). Among the main risk factors found for this increase were the use of substances by the perpetrators, and work overload in women, which decreases the ability to avoid conflict (Alt et al., 2021; Holmes et al., 2020; Marques et al., 2020). In some Latin American countries, adolescents reported an increase in arguments at home (21%) (UNICEF, 2021), stress (52%), and episodes of anxiety (47%) (Naciones Unidas, 2021). In addition, there were increased reports of depression, anxiety, and post-traumatic stress, (Caffo et al., 2021; Rauschenberg et al., 2021; Zhou et al., 2020a) due to the mitigation measures for COVID-19 (SEGOB, 2020). Among adolescents, the most common disorder reported during lockdown was depression (González Rodríguez & Martínez Rubio, 2022). Studies before the pandemic associated exposure to violence with an increase in the probability of developing depression (Orozco Henao et al., 2020; Ughasoro et al., 2022) an increased risk of suicide, (Rossi et al., 2020) dropping out of school, victimization, substance abuse, (Benjet et al., 2013) and perpetration of violence (Kim et al., 2021). The latter was exacerbated as a result of the change in the personal, familial and social dynamics caused by COVID-19 (Gómez Macfarland & Sánchez Ramírez, 2020).

In Mexico, the prevalence of depression in the adolescent population increased from 13.6% in 2018 to 19.7% in 2020 (Shamah-Levy, 2021; Shamah-Levy, 2020). During the pandemic, 36.5% of adolescents between the ages of 15 and 17 reported having experienced some type of violence at home (Larrea-schiavon et al., 2021). These results showed that the prevalence for all types of violence was higher in girls than boys; 20.2% of girls and 19.9% of boys reported physical violence; 30.4% of boys and 38.9% of girls reported psychological violence; 1.1% and 3.6% of boys and girls reported sexual violence; while 43.5% of girls reported some type of online harassment compared to 24.3% of boys (Larrea-schiavon et al., 2021). Previous studies have found that some of the factors associated with being victims of violence among adolescents are being female, directly witnessing violence, and low socioeconomic status (Martín del Campo-Ríos & Cruz-Torres, 2020; Noriega Ruiz & Noriega Saravia, 2021).

Jalisco is a Mexican state where adolescents (ages 15-19) account for 28.2% of the total population, making it one of the states with the highest proportion of adolescents (UNFPA et al., 2021). Before the pandemic, 60.6% of girls and women between the ages of 15 and 29 reported having suffered some type of violence (UNFPA et al., 2021; Suarez & Menkes, 2006). In 2022, it was among the top ten states with the most femicides and reports of family violence (Secretariado Ejecutivo del Sistema Nacional de Seguridad Pública, 2022). In a study conducted of adolescents from Ciudad Guzmán, Jalisco, 5.0% reported family violence and 12.1% severe depression (Díaz-Andrade et al., 2022) revealing the extent of this problem. The present manuscript hypothesizes that violence experienced and depressive symptoms in adolescents may be associated with sociodemographic factors (such as sex, age and job), family, use of video games and social media. This study seeks to analyze the factors associated with the types of interpersonal violence experienced and depression symptoms in adolescents attending school in the south of Jalisco, in the context of COVID-19.

METHOD

Design and study population

Data are drawn from the Mental Health, Addictions and Violence Survey-Jalisco (Spanish acronym ESMAV), administered to middle (n = 51 schools) and high school (n = 19 schools) students from 16 municipalities in southern Jalisco. ESMAV is a cross-sectional study conducted from September to December 2021. The questionnaire was administered online at the schools, with students answering it on their own computers or cell phones. A total of n = 3,215 students were invited to participate, of whom 126 and 43 failed to meet the age criteria (< 12 or > 19 years). The final analytical sample consisted of n = 3,046 adolescents ages 12 to 19.

Measurements

Violence. We collected information on five types of violence experienced in the past 12 months: *1. Physical violence*: a) have you had any type of object such as shoes, kitchen utensils, or furniture thrown at you, whether or not it hit you? b) have you been slapped anywhere on your body? c) have you been burned with an iron, the stove, a match or cigarette or any liquid or another hot object on your body? *2. Psychological violence*: a) has anyone referred to you with rude or aggressive words that have made you feel bad? b) have you had been made fun of due to your physical characteristics, or your knowledge, or your way of thinking, acting and feeling? c) have you been humiliated?; *3. Sexual violence*: a) have you been sexually harassed or forced to let yourself be touched or caressed against your will? b) have you been forced to have sexual intercourse against your will, without or with the use of physical force?; *4. Neglect*: a) have you been tied you up to prevent you from going out or doing what you want to do? b) have you have been prevented from going to the doctor or had your state or health condition neglected when you needed care? c) have your diet, clothing, recreation or education been restricted at home? d) have you been properly taken care of? *5. Digital violence*: a) have you received any type of violence or harassment through the internet/digital social media? Answering "yes" to any of the questions, except for "have you been properly taken care of ?" was regarded as having experienced violence.

Depression. We assessed depression symptoms using The Beck Depression Inventory (BDI-IA), validated (α = .92) in Mexican adolescents (Beltrán et al., 2012). BDI-IA includes 21 items on depression symptoms in the two weeks prior to the survey, with four response options. The score ranges from 0 to 63, with higher scores meaning greater severity. The cut-off point used to discriminate between those who presented with depressive symptoms and those who did not, adjusted for gender, is 14 points in boys and 18 in girls.

Covariates: We obtained sociodemographic information on sex, age (categorized as 12-14 years and 15-19 years); grade point average (< 8.0, 8-9, 9-10) being employed (Yes/No); frequency of social media use (Facebook, Twitter, Instagram, TikTok, WhatsApp, Twitch) in the past month (never/rarely /occasional/frequent/very frequent); and hours of daily use of videogames (I don't play/ < 1 hour 1 to ≥ 5 hours per day) (Barrientos-Gutierrez et al., 2019). Parents' educational attainment was included (complete secondary school or less/complete or incomplete high school/college degree or more/Doesn't know/Doesn't have a father/mother). Wealth was measured with the Family Affluence Scale (FAS) (Pérez et al., 2021), an index comprising four items: a) how many cars or vans does your family own? (0/1/2 or more), b) do you have a room to yourself? (0/1), c) during the past 12 months, how many times did you go on vacation with your family? (0/1/2/3 or more), and d) how many computers does your family have? (0/1/2/3 or more), with scores ranging from 0 to 9. Higher scores indicate greater family wealth, with scores being classified into three categories: low (0–2 points), medium (3–5 points), and high (6–9 points).

Table 1
Sociodemographic characteristics of the sample. ESMAV-Jalisco 2021 (n = 3 046)

Variables	*n*	*%*
Sex		
Male	1 299	42.7
Female	1 747	57.4
Age in Years		
12 to 14	2 377	78.0
15 to 19	669	22.0
Grade Point Average		
< 8.0	782	25.7
8.0 to 8.9	1 093	35.9
9.0 to 10	1 171	38.4
Employed		
Yes	897	29.5
Social Media Use		
Never	320	10.5
Rarely/occasionally	650	21.3
Frequently/very frequently	2 076	68.2
Videogame use time		
I don't play	1 246	40.9
< 1 hour per day	597	19.6
1 hour per day	386	12.7
2 hours per day	365	12.0
3 hours per day	201	6.6
4 hours per day	112	3.7
≥ 5 hours per day	139	4.6
Father's education		
Complete secondary school or less	1 850	60.7
Complete or incomplete high school	567	18.6
College degree or more	253	8.3
Doesn't know	235	7.7
Doesn't have a father	141	4.6
Mother's education		
Complete secondary school or less	1 836	60.3
Complete or incomplete high school	740	24.3
College degree or more	304	10.0
Doesn't know	158	5.2
Doesn't have a mother	8	.3
Family Affluence Scale*		
Low	1 054	34.6
Medium	1 366	44.9
High	626	20.6
Depression**		
Yes	878	28.8
Violence experienced		
Physical	1 429	46.9
Psychological	1 299	42.7
Sexual	159	5.2
Neglect	1 064	34.9
Digital	375	12.3

Note: SD = Standard deviation.
* Family Affluence Scale (FAS): low = 0-2 points; medium = 3-5 points; high = 6-9 points.
** Depression: ≥ 14 for boys and ≥ 18 for girls, according to The Beck Depression Inventory.

Table 2

Crude and Adjusted Odds Ratio of Sociodemographic Variables and Their Association with Experiencing Physical, Psychological, Sexual, and Digital Violence and Neglect in Adolescence. ESMAV-Jalisco 2021 (n = 3 046)

	Physical			*Psychological*			*Sexual*			*Neglect*			*Digital*		
Variables	%	*OR crude[1] 95% CI*	*OR adjusted[2] 95% CI*	%	*OR crude[1] 95% CI*	*OR adjusted[2] 95% CI*	%	*OR crude[1] 95% CI*	*OR adjusted[2] 95% CI*	%	*OR crude[1] 95% CI*	*OR adjusted[2] 95% CI*	%	*OR crude[1] 95% CI*	*OR adjusted[2] 95% CI*
Sex															
Male	47.3	ref.	ref.	35.2	ref.	ref.	1.8	ref.	ref.	32.3	ref.	ref.	7.6	ref.	ref.
Female	46.7	1.0 (.8-1.1)	.8 (.6-.9)*	48.2	1.7 (1.5-2.0)[a]	1.9 (1.5-2.3)[a]	7.8	4.7 (3.0-7.3)[a]	3.6 (2.2-6.0)[a]	36.9	1.2 (1.1-1.4)*	1.0 (.8-1.2)	15.8	2.3 (1.8-2.9)[a]	1.7 (1.3-2.3)[a]
Age in years															
12 to 14	46.7	ref.	ref.	40.5	ref.	ref.	4.1	ref.	ref.	34.1	ref.	ref.	9.9	ref.	ref.
15 to 19	47.5	1.0 (.9-1.2)	.7 (.6-.9)[a]	50.4	1.5 (1.3-1.8)[a]	1.3 (1.0-1.6)*	9.3	2.4 (1.7-3.3)[a]	1.7 (1.2-2.5)[a]	37.8	1.2 (1.0-1.4)	.9 (.8-1.1)	20.9	2.4 (1.9-3.0)[a]	2.0 (1.6-2.7)[a]
Grade Point Average															
< 8.0	50.8	ref.	ref.	48.7	ref.	ref.	8.7	ref.	ref.	41.9	ref.	ref.	16	ref.	ref.
8.0 to 8.9	50.1	1.0 (.8-1.2)	1.2 (1.0-1.4)	43	.8 (.7-1.0)*	.9 (.7-1.1)	4.5	.5 (.3-.7)[a]	.6 (.4-.8)[a]	37.8	.8 (.7-1.0)	.9 (.8-1.1)	11.9	.7 (.5-.9)*	.8 (.6-1.1)
9.0 to 10	41.4	.7 (.6-.8)[a]	.9 (.7-1.1)	38.3	.7 (.5-.8)[a]	.8 (.7-1.0)	3.6	.4 (.3-.6)[a]	.5 (.3-.8)[a]	27.6	.5 (.4-.6)[a]	.6 (.5-.8)[a]	10.3	.6 (.5-.8)[a]	.8 (.6-1.1)
Employed															
No	42.8	ref.	ref.	39.6	ref.	ref.	4.4	ref.	ref.	32.4	ref.	ref.	11	ref.	ref.
Yes	56.9	1.8 (1.5-2.1)[a]	1.5 (1.3-1.8)[a]	49.9	1.5 (1.3-1.8)[a]	1.2 (1.0-1.5)	7.1	1.7 (1.2-2.3)[a]	1.2 (.8-1.7)	41	1.5 (1.2 -1.7)[a]	1.3 (1.1-1.5)[a]	15.5	1.5 (1.2-1.9)[a]	1.1 (.9-1.4)
Social Media Use															
Never	33.8	ref.	ref.	28.1	ref.	ref.	3.1	ref.	ref.	30.9	ref.	ref.	6.3	ref.	ref.
Rarely/occasionally	37.4	1.2 (.9-1.6)	1.1 (.8-1.5)	34	1.3 (1.0-1.8)	1.2 (.8-1.6)	2.9	.9 (.4-2.0)	.6 (.3-1.4)	32.2	1.1 (.8-1.4)	.9 (.7-1.2)	7.7	1.3 (.7-2.1)	1.0 (.6-1.8)
Frequent/very frequent	51.9	2.1 (1.7-2.7)[a]	1.7 (1.3-2.2)[a]	47.6	2.3 (1.8-3.0)[a]	1.4 (1.0-1.9)*	6.3	2.1 (1.1-4.0)*	.8 (.4-1.6)	36.4	1.3 (1.0-1.7)	1.0 (.7-1.3)	14.7	2.6 (1.6-4.1)[a]	1.3 (.8-2.2)
Video game use time															
I don't play	42.9	ref.	ref.	42.2			6.5	ref.	ref.	37.3	ref.	ref.	13.6	ref.	ref.
< 1 hour per day	44.2	1.1 (.9-1.3)	1.1 (.8-1.3)	38.4	.9 (.7-1.0)	1.1 (.8-1.4)	3.5	.5 (.3-.9)*	.7 (.4-1.3)	34.7	.9 (.7-1.1)	.9 (.7-1.1)	9.6	.7 (.5-.9)*	.9 (.6-1.3)
1 hour per day	50	1.3 (1.1-1.7)*	1.3 (1.0-1.7)	41.7	1.0 (.8-1.2)	1.2 (.9-1.6)	4.2	.6 (.4-1.1)	.9 (.5-1.6)	33.7	.9 (.7-1.1)	.8 (.7-1.1)	12.2	.9 (.6-1.3)	1.2 (.8-1.8)
2 hours per day	51	1.4 (1.1-1.7)[a]	1.2 (.9-1.6)	42.7	1.0 (.8-1.3)	1.3 (1.0-1.8)	3.8	.6 (.3-1.0)	1.0 (.5-1.8)	30.1	.7 (.6-.9)*	.7 (.5-.9)*	9.6	.7 (.5-1.0)*	.9 (.6-1.4)
3 hours per day	54.2	1.6 (1.2-2.1)[a]	1.3 (.9-1.9)	44.3	1.1 (.8-1.5)	1.3 (.9-1.9)	5.5	.8 (.4-1.6)	1.5 (.7-3.1)	30.4	.7 (.5-1.0)	.7 (.5-1.0)	11.4	.8 (.5-1.3)	1.1 (.6-1.9)
4 hours per day	50.9	1.4 (.9-2.0)	1.0 (.7-1.6)	52.7	1.5 (1.0-2.3)*	2.1 (1.3-3.4)[a]	6.3	1.0 (.4-2.1)	1.4 (.6-2.2)	28.6	.7 (.4-1.0)	.6 (.4-.9)*	10.7	.8 (.4-1.4)	.9 (.4-1.7)
≥ 5 hours per day	61.2	2.1 (1.5-3.0)[a]	1.4 (.9-2.1)	56.8	1.8 (1.3-2.6)[a]	1.6 (1.0-2.5)*	6.5	1.0 (.5-2.0)	1.0 (.4-2.2)	42.5	1.2 (.9-1.8)	1.0 (.7-1.5)	23	1.9 (1.2-2.9)[a]	2.1 (1.3-3.5)[a]
Father's education															
Complete secondary school or less (ref.)	47.4	ref.	ref.	41.1	ref.	ref.	4.9	ref.	ref.	35.1	ref.	ref.	11.5	ref.	ref.
Complete or incomplete high school	47.6	1.0 (.8-1.2)	.9 (.7-1.1)	43.6	1.1 (.9-1.3)	1.1 (.9-1.5)	6	1.2 (.8-1.9)	1.4 (.9-2.2)	31.2	.8 (.7-1.0)	.9 (.7-1.2)	11.3	1.0 (.7-1.3)	.8 (.6-1.1)
College degree or more	41.9	.8 (.6-1.0)	.7 (.5-.9)*	44.3	1.1 (.9-1.5)	1.2 (.9-1.7)	3.6	.7 (.4-1.4)	.7 (.3-1.6)	26.9	.7 (.5-.9)*	.9 (.6-1.3)	13.4	1.2 (.8-1.8)	1.0 (.6-1.6)
Doesn´t know	46.8	1.0 (.7-1.3)	.9 (.6-1.3)	46.4	1.2 (.9-1.6)	1.1 (.8-1.7)	6	1.2 (.7-2.2)	1.0 (.5-2.1)	46	1.6 (1.2-2.1)[a]	1.6 (1.1-2.2)*	15.3	1.4 (1.0-2.0)	1.2 (.7-2.0)
Doesn't have a father	46.8	1.0 (.7-1.4)	.8 (.5-1.2)	49.7	1.4 (1.0-2.0)*	1.2 (.8-1.8)	7.8	1.6 (.9-3.1)	1.1 (.5-2.2)	43.3	1.4 (1.0-2.0)	1.4 (.9-1.9)	19.9	1.9 (1.2-3.0)[a]	1.4 (.8-2.3)
Mother's education															
Complete secondary school or less (ref.)	46.6	ref.	ref.	41.3	ref.	ref.	5.4	ref.	ref.	37.4	ref.	ref.	11.2	ref.	ref.
Complete or incomplete high school	47.4	1.0 (.9-1.2)	1.0 (.8-1.3)	43.2	1.1 (.9-1.3)	1.0 (.8-1.3)	4.6	.8 (.6-1.3)	.8 (.5-1.3)	31.4	.8 (.6-.9)*	.8 (.6-.9)[a]	13.5	1.2 (1.0-1.6)	1.3 (1.0-1.8)
College degree or more	49	1.1 (.9-1.4)	1.1 (.8-1.5)	48.4	1.3 (1.0-1.7)*	1.4 (1.0-1.9)	5.9	1.1 (.7-1.9)	1.1 (.6-2.1)	24.7	.6 (.4-.7)[a]	.5 (.4-.7)[a]	15.1	1.4 (1.0-2.0)	1.5 (.9-2.3)
Don't know	43	.9 (.6-1.2)	.7 (.5-1.2)	44.9	1.2 (.8-1.6)	1.1 (.7-1.8)	5.1	.9 (.5-2.0)	.8 (.3-2.1)	43.7	1.3 (.9-1.8)	.9 (.6-1.4)	13.9	1.3 (.8-2.1)	1.1 (.6-2.1)
Don't have a mother	62.5	1.9 (.5-8.0)	3.1 (.7-14.6)	25	.5 (.1-2.4)	.4 (.1-2.2)	0	NEO	NEO	12.5	.2 (.0-2.0)	.2 (.0-1.7)	12.5	1.1 (.1-9.2)	2.1 (.3-18.6)
Family Affluence Scale[1]															
Low	42.3	ref.	ref.	38.5	ref.	ref.	4.8	ref.	ref.	32.2	ref.	ref.	9.8		
Medium	48.9	1.3 (1.1-1.5)*	1.2 (1.0-1.4)	44.6	1.3 (1.1-1.5)[a]	1.1 (.9-1.3)	5.6	1.2 (.8-1.7)	1.03 (.7-1.6)	34.9	1.1 (1.0-1.3)	1.2 (1.0-1.4)	13.7	1.46 (1.1-1.9)[a]	1.3 (1.0-1.7)
High	50.3	1.4 (1.1-1.7)*	1.2 (.9-1.5)	45.4	1.3 (1.1-1.6)[a]	.9 (.7-1.2)	5	1.0 (.7-1.6)	.9 (.5-1.5)	39.6	1.4 (1.1-1.7)[a]	1.7 (1.4-2.2)[a]	13.6	1.45 (1.1-2.0)*	1.2 (.8-1.7)
Experienced violence															
Physical															
No		--	--	22.6	ref.	ref.	2.2	ref.	ref.	31	ref.	ref.	7.4	ref.	ref.
Yes		--	--	65.4	6.5 (5.5-7.6)[a]	6.0 (5.0-7.1)[a]	8.6	4.1 (2.8- 6.0)[a]	1.8 (1.2-2.8)[a]	39.4	1.5 (1.3-1.7)[a]	1.0 (.8-1.2)	17.9	2.8 (2.2-3.5)[a]	1.3 (1.0-1.8)*
Psychological															
No	28.3	ref.	ref.		--	--	1	ref.	ref.	27.5	ref.	ref.	4.5	ref.	ref.
Yes	71.9	6.5 (5.5-7.6)[a]	6.0 (5.0-7.1)[a]		--	--	10.9	12.5 (7.5-20.8)[a]	5.2 (3.0-9.1)[a]	45	2.2 (1.9-2.5)[a]	1.8 (1.5-2.2)[a]	22.8	6.2 (4.8-8.1)[a]	3.6 (2.7-4.8)[a]
Sexual															
No	45.2	ref.	ref.	40.1	ref.	ref.		--	--	33.5	ref.	ref.	10.3	ref.	ref.
Yes	77.4	4.1 (2.8-6.0)[a]	1.8 (1.2-2.7)[a]	89.3	12.5 (7.5-.8)[a]	5.0 (2.9-8.9)[a]		--	--	60.4	3.0 (2.2-4.2)[a]	1.7 (1.2- 2.5)[a]	49.7	8.6 (6.2-12.1)[a]	3.6 (2.5-5.2)[a]
Neglect															
No	43.7	ref.	ref.	36.1	ref.	ref.	3.2	ref.	ref.		--	--	8.5	ref.	ref.
Yes	52.9	1.5 (1.3-1.7)[a]	1.0 (.8-1.2)	54.9	2.2 (1.9-2.5)[a]	1.8 (1.5-2.2)[a]	9	3.0 (2.2- 4.2)[a]	1.7 (1.2-2.5)[a]		--	--	19.4	2.6 (2.1-3.2)[a]	1.8 (1.4-2.3)[a]
Digital															
No	43.9	ref.	ref.	37.6	ref.	ref.	3	ref.	ref.	32.1	ref.	ref.		--	--
Yes	68.3	2.8 (2.2-3.5)[a]	1.3 (1.0-1.8)*	78.9	6.2 (4.8-8.1)[a]	3.6 (2.7-4.8)[a]	21.1	8.6 (6.2-12.1)[a]	3.6 (2.5-5.2)[a]	54.9	2.6 (2.1-3.2)[a]	1.8 (1.4-2.3)[a]		--	--

OR: Odds Ratio; CI: Confidence interval; [1] Logistic regression model; [2] Logistic regression model adjusted for all covariates; * $p < .05$; [a] $p < .01$.

Statistical analysis

A descriptive analysis was performed to calculate the percentages for each of the categorical variables. Separate Bivariate (OR) and multivariate logistic regression models (aOR) were fitted. First, we explored whether experiencing any type of violence was associated with depression symptoms and any other of the sociodemographic variables. A second set of logistic regression models were fitted to determine the association between experiencing any of the five types of violence and depression symptoms and all the sociodemographic and family variables, including experiencing each of the five types of violence. Analyses were performed using Stata v.15 software (StataCorp LP, College Station, TX, USA). (Stata Statistical Software: Release 14; Stata Corp., 2017).

Ethical considerations

Informed consent and assent were requested prior to data collection. The protocol was approved by the Ethics Committee and Research Committee of Health Region VI of Ciudad Guzmán (103/RVI/2021).

RESULTS

In our sample, 57.4% were girls and 78.0% were ages 12-14. Results show a prevalence of 28.8% of depression, 46.9% reported physical violence, 42.7% psychological violence, 34.9% neglect, 12.3% digital violence and 5.2% sexual violence (Table 1).

The factors associated with higher odds of physical violence were being employed (aOR = 1.5 95% CI [1.3-1.8]) and frequent/very frequent use of social media (aOR = 1.7 95% CI [1.3-2.2]). Conversely, being a girl (aOR = .8 95% CI [.6-.9]), being 15-19 rather than 12-14 years old (aOR = .7 95% CI [.6-.9]) and having a father with a bachelor's degree or more (aOR = .7 95% CI [.5-.9]) were associated with lower odds of experiencing physical violence (Table 2).

Higher odds of psychological violence were associated with being a girl (aOR = 1.9 95% CI [1.5-2.3]), being 15-19 years old (aOR = 1.3 95% CI [1.0-1.6]), frequent/very frequent use of social media (aOR = 1.4 95% CI [1.0-1.9]), using video games four hours a day (aOR = 2.1 95% CI [1.3-3.4]) and ≥ 5 hours a day (aOR = 1.6 95% CI [1.0-2.5]) (Table 2).

Higher odds of sexual violence were associated with being a girl (aOR = 3.6 95% CI [2.2-6]) and being 15-19 years old (aOR = 1.7 95% CI [1.2-2.5]). Those with a higher grade point average (aOR = .5 95% CI [.3-.8]) were less likely to experience sexual violence (Table 2).

Table 3
Crude and adjusted odds ratio of depression symptoms and their association with sociodemographic variables and physical, psychological, sexual, and digital violence and neglect experienced in adolescence in southern Jalisco. ESMAV-Jalisco 2021 (n = 3 046)

	Depression symptoms		
Variable	%	*OR crude*[1] *95% CI*	*OR adjusted*[2] *95% CI*
Sex			
Male	22.0	ref.	ref.
Female	34.0	1.8 (1.5-2.1)[a]	1.7 (1.4-2.1)[a]
Age			
12 to 14	26.3	ref.	ref.
15 to 19	33.8	1.7 (1.4-2.0)[a]	1.5 (1.2-1.8)[a]
Grade Point Average			
< 8.0	38.0	ref.	ref.
8.0 to 8.9	30.0	.7 (.6-.8)[a]	.8 (.6-1.0)*
9.0 to 10	22.0	.5 (.4-.6)[a]	.6 (.5-.8)[a]
Employment			
No	27.0	ref.	ref.
Yes	34.0	1.4 (1.2-1.7)[a]	1.1 (.9-1.3)
Social Media Use			
Never	18.0	ref.	ref.
Rarely/occasionally	24.0	1.4 (1.0-2.0)*	1.2 (.8-1.7)
Frequently/very frequently	32.0	2.1 (1.5-2.8)[a]	1.2 (.8-1.6)
Videogame use time			
I don't play	29.0	ref.	ref.
< 1 hour per day	25.0	.9 (.7-1.1)	1.1 (.9-1.5)
1 hour per day	23.0	.8 (.6-1.0)*	1.0 (.7-1.3)
2 hours per day	31.0	1.1 (.9-1.5)	1.6 (1.2-2.2)[a]
3 hours per day	28.0	1.0 (.7-1.4)	1.4 (.9-2.1)
4 hours per day	41.0	1.8 (1.2-2.6)[a]	2.3 (1.4-3.6)[a]
≥ 5 hours per day	49.0	2.4 (1.7-3.4)[a]	2.7 (1.7-4.1)[a]
Father's education			
Complete secondary school or less	27.0	ref.	ref.
Complete or incomplete high school	28.0	1.0 (.8-1.3)	1.0 (.8-1.3)
College degree or more	25.0	.9 (.7-1.2)	.9 (.6-1.4)
Doesn´t know	38.0	1.6 (1.2-2.2)[a]	1.4 (.9-2.0)
Doesn't have a father	43.0	2.0 (1.4-2.8)[a]	1.5 (1.0-2.3)*
Mother's education			
Complete secondary school or less	29.0	ref.	ref.
Complete or incomplete high school	27.0	.9 (.8-1.1)	.9 (.7-1.1)
College degree or more	29.3	1.0 (.8-1.3)	1.1 (.8-1.5)
Doesn't know	39.0	1.6(1.1-2.2)[a]	1.3 (.8-2.0)
Doesn't have a mother	13.0	.4 (.0-2.9)	.5 (.1-4.3)
Family Affluence Scale[1]			
Low	29.0	ref.	ref.
Medium	29.0	1.0 (.9-1.2)	.9 (.7-1.1)
High	29.0	1.0 (.8-1.2)	.8 (.6-1.0)
Violence experienced			
Physical			
No	20.0	ref.	ref.
Yes	39.0	2.7 (2.3-3.1)[a]	1.3 (1.1-1.6)[a]
Psychological			
No	14.0	ref.	ref.
Yes	50.0	6.3 (5.3-7.5)[a]	4.1 (3.4-5.1)[a]
Sexual			
No	27.0	ref.	ref.
Yes	64.0	4.7 (3.4-6.6)[a]	1.4 (1.0-2.1)
Neglect			
No	23.0	ref.	ref.
Yes	40.0	2.3 (1.9-2.7)[a]	1.6 (1.3-1.9)[a]
Digital			
No	25.0	ref.	ref.
Yes	59.0	4.3 (3.5-5.4)[a]	2.0 (1.5-2.5)[a]

Note: OR: Odds Ratio; CI: Confidence interval; [1] Logistic regression model; [2] Logistic regression model adjusted for all covariates; * $p < .05$; [a] $p < .01$.

Violence due to neglect was higher among those who reported being employed (aOR = 1.3 95% CI [1.1-1.5]), adolescents who did not know their father's educational attainment (aOR = 1.6 95% CI [1.1-2.2]), and those who belonged to the highest tercile of the FAS (aOR = 1.7 95% CI [1.4-2.2]). However, those with a high grade point average (aOR = .6 95% CI [.5-.8]) and a mother with at least a high school education (aOR = .5 95% CI [.4-.7]) were less likely to report dropping out. Being a girl (aOR = 1.7 95% CI [1.3-2.3]), being aged between 15 and 19 (aOR = 2.0 95% CI [1.6-2.7]) and using video games ≥ 5 hours a day (aOR = 2.1 95% CI [1.3-3.5]) were associated with higher odds of digital violence (Table 2).

Being a girl (aOR = 1.7 95% CI [1.4-2.1]), being 15-19 years old (aOR = 1.5 95% CI [1.2-1.8]), not having a father (aOR = 1.54 95% CI [1.03-2.33]) and using video games ≥ 5 hours per day (aOR = 2.7 95% CI [1.7-4.1]), were associated with greater odds of depression symptoms (Table 3). Physical (aOR = 1.3 95% CI [1.1-1.6]), psychological (aOR = 4.1 95% CI [3.4-5.1]), and digital violence (aOR = 2 95% CI [1.5-2.5]) and neglect (aOR = 1.6 95% CI [1.3-1.9]) were associated with higher odds of depression symptoms (Table 3).

DISCUSSION AND CONCLUSION

The results of this study show the factors associated with violence and depression symptoms during the COVID-19 pandemic among the adolescent population of southern Jalisco. Experiencing any kind of violence of any type increases the possibility of having depressive symptoms. Likewise, the odds of having depression symptoms were associated with being female, being aged between 15 and 19 years old, poor school performance, and greater use of social media and videogames.

We found a higher prevalence of physical (47.0%), psychological (42.7%) and sexual violence (5.2%) than another study (Larrea-schiavon et al., 2021) conducted of Mexican adolescents in the same year. That study reported that 20.3% suffered physical, 35.0% psychological and 2.6% sexual violence. Online bullying was almost three times higher than what was reported in our study as digital violence (12.3% vs. 34.4%). An explanation for the differences between these studies could be the age range of the participants (12-19 vs. 15-18) or the way the question was framed (have you experienced online harassment?). Likewise, virtual education increased the time spent using the internet, which could have meant greater exposure to digital violence (Armitage, 2021). Our results showed that frequent and very frequent use of social media and videogames increased the probability of experiencing physical, psychological and digital violence, especially among girls, and adolescents aged between 15 and 19 years, as has been reported in other studies (Instituto Nacional de Estadística y Geografía [INEGI], 2021; Quispe et al., 2021).

Prior to the pandemic, various studies reported that for some women and their children, the home was the most dangerous place to be (ONU Mujeres, 2020; UNICEF México, 2020) while during the pandemic, several countries reported that violence against women increased, which was reflected in the number of calls to helplines and the demand for shelters, which were filled to capacity (Mlambo-Ngcuka, 2020). Factors such as increased stress, financial and food insecurity, unemployment, and restrictions on movement contributed to the increase in levels of domestic violence (Chandan et al., 2020; World Health Organization, 2020).

Our results show that adolescents with jobs experienced more physical violence and perceived that they were neglected. Due to the nature of this study, it is impossible to tell whether they sought employment after being subjected to physical violence, or whether being employed exposed them to this type of violence. However, child labor has been considered a risk factor for violence and a violation of the rights of children and adolescents, since it can prevent their physical and mental development, becoming a risk factor in their adult lives (Nova Melle, 2008). Various studies (Holt et al., 2008; Renner & Slack, 2006) state that experiencing physical violence at early stages of life has lasting effects on mental health, drug and alcohol misuse (especially in women), risky sexual behavior, obesity and criminal behavior, that persist into adulthood. Children and adolescents who do so are also at risk of reproducing abuse and other types of violence when they are adults. Neglect is at least as harmful as physical or sexual violence in the long term, but has received less scientific and public attention (Gilbert et al., 2009; Pérez Candás et al., 2018).

Neglect was also associated with not knowing the father's educational attainment and belonging to the highest tercile of the FAS. However, participants with a high grade point average and mothers with a high school education were less likely to report neglect. It is possible that heads of households with higher incomes spend more time away from home, which in turn causes adolescent to feel abandoned and to regard this absence as a failure to appropriately take care of their needs (Lopes da Rocha, 2002). Conversely, when the mother is the primary caregiver and has higher educational attainment, she can make better decisions about the care and mental well-being of the child (Arroyo-Borrell et al., 2017). This finding about family factors is related to care, attention and the establishment of discipline. In addition, the absence of family supervision or the weakening of parental authority combined with violence as a form of communication in the family, are contributing factors to mental health disorders in the adolescent population (Rozemberg et al., 2014). Given the mental health impact and social consequences of neglect on adolescents, more research should be conducted on this issue. A systematic review (Haslam & Taylor, 2022) shows that neglect increases the risk of involvement in gangs and relationships with risky peers, which increases the social violence experienced in Mexico.

The prevalence of depression was similar to that reported prior to the pandemic. In our sample, three out of ten adolescents reported suffering from depression at the time of the survey, with systematic reviews reporting a global prevalence of 25% (González Rodríguez & Martínez Rubio, 2022). A previous study conducted of adolescents from Ciudad Guzmán, Jalisco, prior to the pandemic, (Díaz-Andrade et al., 2022) reported 25.4% with moderate depression. Other studies (Maciel-Saldierna et al., 2022; Vásquez, 2013) of schoolchildren from Jalisco report a difference in depression by sex. As has already been studied, violence can have repercussions on the loss of motivation, joy, the ability to create, to innovate, and even the desire to live (Quirós, 2007).

Studies conducted Mexico suggest that adolescent girls are more prone to family violence (Cerecero-García et al., 2020). The adolescent girls in our study were more likely to experience psychological, sexual, and digital violence than boys, as has been reported in the statistics on violence against children and adolescent women in Mexico (Álvarez Gutiérrez & Castillo Koschnick, 2019). The state of constant alertness and vigilance in the face of imminent danger experienced by female victims of violence has direct consequences at the individual, family, and community level, hence the need to deepen the analysis in a broader context.

Depression was 1.67 times more likely among adolescent girls than boys, as in other countries (Zhou et al., 2020b). These data highlight the inequality between men and women in Jalisco (Instituto Jalisciense de las Mujeres, 2015). However, it could be that women report more because it is more socially acceptable for women to talk about their feelings than it is for men. Likewise, the fact that women tend to report more emotional or psychological disorders compared to men could be due to social and economic disadvantages as other studies have reported (Gaviria Arbelaez, 2009). Among the main factors associated with depression (Duan et al., 2020; González Rodríguez & Martínez Rubio, 2022; Panchal et al., 2023) are being between 15 and 19 years old, using social media more than five hours a day and working during the pandemic. These factors reflect the prevention measures implemented during this period. The greater use of social media as a means of communication and for school activities may have hindered face-to-face interpersonal relationships, affecting all areas of adolescents' lives, at a time when socialization with their peers is crucial (Meherali et al., 2021).

This study has certain limitations. First, our sample was drawn from schools in a region of Jalisco, meaning that results cannot be generalized to the general adolescent population. However, it provides relevant information on the factors analyzed. Violence is considered a sensitive topic, which could lead to the underreporting of data because it takes place in the family environment. However, the presence of underreporting would only lend further credence to our results. Finally, The Beck Questionnaire is a long instrument and could tire participants, causing them to answer without thinking. However, the instrument is used with and has been validated in the adolescent population (Beltrán et al., 2012).

Violence is a public health problem that should be addressed at early stages of life to guarantee the safe development of the population. The lockdown experienced during the pandemic impacted the interpersonal relationships of the adolescent population, exacerbating violence, evidencing depression problems, more frequently in girls, placing them at greater risk of experiencing depression and various types of violence. Given that the adolescent population has different risk factors, it is vital to implement specific interventions with a gender perspective to guarantee the protection of life with dignity and free of violence for adolescents.

It is also essential to adopt intersectoral social intervention strategies. We consider it necessary to address violence and depression through alliances with various social and institutional sectors (such as the education and health systems, and families) and to be able to guarantee the exercise of human rights. At the same time, the educational model for discipline or parenting within families in the south of Jalisco must guarantee the protection of life with dignity and without violence.

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Conflict of interest

The authors declare they have no conflicts of interest.

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El número de autores dependerá del tipo de manuscrito enviado. Para artículos originales y artículos de revisión el número máximo de autores será de ocho. Solo cuando se trate de estudios multicéntricos el número máximo de autores será de doce, siempre y cuando se justifique de acuerdo con el alcance del estudio.

En caso de autoría colectiva, se incluirá el nombre de los redactores o responsables del trabajo seguido de «*y el grupo...*» cuando todos los miembros del grupo se consideren coautores del trabajo. Si se desea incluir el nombre del grupo, aunque no todos sus miembros sean considerados coautores, se mencionarán a los autores responsables seguido de *«en nombre del grupo...»* o *«por el grupo...»*. En cualquier caso, los nombres e instituciones de los miembros del grupo se incluirán en un anexo al final del manuscrito.

LINEAMIENTOS EDITORIALES

Es muy importante que los autores consideren los siguientes puntos antes de enviar sus manuscritos:

1. Los manuscritos deben redactarse de forma clara y concisa, sin errores de ortografía ni de sintaxis.
2. El texto debe estar escrito en formato Word, en fuente Times New Roman de 12 puntos, a doble espacio, con márgenes de 2.5 cm. y en tamaño carta.
3. Las páginas se numeran consecutivamente, empezando por la página del título y con el número escrito en la esquina superior derecha.
4. La primera página (donde se encuentra el título) debe contener los siguientes apartados en el orden que aquí se menciona:
   - **Título del trabajo en español y en inglés.** El título debe ser descriptivo e indicar los resultados principales del estudio. *Extensión máxima: 25 palabras*
   - **Título corto en español y en inglés.** *Extensión máxima: 6 palabras*.
   - **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 http://revistasaludmental.mx/public/Carta-autorizacion-para-publicacion.pdf.
2. ***Carta de presentación.*** El autor debe exponer las fortalezas de su aportación científica, resaltando el alcan-

ce, 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* (http://www.trend-statement.org).
     - 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://academic.oup.com/intqhc/article/19/6/349/1791966/Consolidated-criteria-for-reporting-qualitative).
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 www.revistasaludmental.mx

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 (See ethical guidelines for publication. Add link)

     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 http://revistasaludmental.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