Research paper

Factors associated with depressive symptomatology during the COVID-19 pandemic in Mexico: A 2021 national survey

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ABSTRACT

Background: Previous studies have identified a set of variables associated with depression during the COVID-19 pandemic. However, the existing antecedents in Mexico, in addition to being limited to the beginning of the health emergency, made use of small and unrepresentative samples. Therefore, the aim of the present study was to identify the prevalence and factors associated with clinically significant depressive symptomatology (CSDS) in a representative Mexican sample of 2021.
Methods: A secondary cross-sectional analysis of the Encuesta Nacional de Bienestar Autorreportado (ENBIARE) was conducted. For the present study, the effective sample was 30,901. Univariate and bivariate anaylses were followed by a multiple Poisson regression, which served to obtain adjusted prevalence ratios of each variable under study.
Results: The prevalence of CSDS in the year 2021 was 15.3 %. In the multivariable analysis, the factors associated with CSDS were the number of recent stressful events, having a major functional limitation, not having social support from family or friends, being female, having suffered recent discrimination, alcohol or other drug use (by oneself or someone at home), not being married or cohabiting, living in a rural area, having had a diagnosis of COVID-19, having lost a job, living with a chronic patient, not doing physical exercise, and having a low educational level.
Limitations: The main limitations were the cross-sectional nature of the data, the use of self-report measures, as well as the fact that this was a secondary analysis that did not allow consideration of additional variables.
Conclusions: A set of personal and contextual variables were identified that can help focus prevention and intervention efforts on the phenomenon of depression.

1. Introduction

The COVID-19 pandemic has been an international public health emergency, the rapid spread of which had to be contained by extraordinary measures, such as quarantining entire cities and countries. These measures were associated with significant negative effects on the mental health of populations (Röhr et al., 2020). In this context, depressive symptomatology has reached a worrying notoriety, as according to the World Health Organization (2022) the prevalence of depression during the COVID-19 pandemic increased by 25 %. In fact, several studies have reported the increased incidence of depressive symptoms among the general population associated with COVID-19 exposure (Lakhan et al., 2020; Lei et al., 2020; Li et al., 2020; Liang et al., 2020; Tang et al., 2020). In the case of Mexico, 13.6 % of the population presented clinically significant depressive symptoms before the pandemic according to the latest national estimate made in 2018 (Cerecero-García et al., 2020). In April 2020, this value increased to 27.3 %, although it tended to decrease slightly in the following months, reaching 19.7 % in October of

the same year (Teruel-Belismelis et al., 2021).

Due to the importance of depression as a public health problem, several studies have sought to identify possible factors associated with it. Variables such as being female, being older, being single, widowed or divorced, not having children, having a low economic and educational level, being unemployed, having poor family support, living alone, having little physical activity, as well as the number of stressors experienced were related to a greater presence of depressive symptoms in previous research (Hajek et al., 2022; Hernández-Vásquez et al., 2020; Köhler et al., 2018; Villarroel and Terlizzi, 2020; Yu et al., 2020). In the specific context of the pandemic, having suffered from COVID-19, having family members or living with people with this diagnosis, having a history of chronic illness or any disability, as well as experiencing prolonged quarantine times and being overexposed to negative news related to the pandemic were variables associated with greater presence of depressive symptoms (Alzahrani et al., 2022; Cortés-Álvarez et al., 2020; Hajek et al., 2022; Pengpid and Peltzer, 2022; Shah et al., 2021; Tareke et al., 2022; Wang et al., 2020; Xiong et al., 2020).

In the case of Mexico, one study administered the Depression, Anxiety and Stress Scales (DASS-21) to 1105 adults and found that 15.7 % of the participants presented symptoms of moderate to severe depression (Cortés-Álvarez et al., 2020). Another study used the Patient Health Questionnaire (PHQ-9) through an online survey among 1508 Mexicans and found that the prevalence of severe depressive symptoms was 27.5 % (Galindo-Vázquez et al., 2020). Likewise, a longitudinal study in 466 Mexican pregnant women found that higher stress during the pandemic was associated with increased depressive symptoms, whereas social support had a protective effect and was associated with lower odds of depression (Rivera Rivera et al., 2021). Finally, in a nationally representative study, it was observed that the prevalence of depression was much higher at the beginning of the pandemic (April 2020) and tended to decrease over the months (Teruel-Belismelis et al., 2021).

It is worth mentioning that most published research on depression in Mexico during the COVID-19 pandemic has been limited to relatively small and nationally unrepresentative samples. In the case of the study by Teruel-Belismelis et al. (2021), a probabilistic sampling of the entire country was conducted; however, the data are restricted to the year 2020 and a set of possible associated variables was not examined in detail. Furthermore, the application of online surveys may not adequately represent mental health status, and may not be accessible to non-users of social networks.

Given the above, it is necessary to conduct a nationally representative study on the variables associated with depression in the context of COVID-19 beyond the first year of the pandemic. Therefore, the present investigation aims to estimate the prevalence and associated factors of clinically significant depressive symptomatology (CSDS) in the Mexican population during the year 2021.

2. Method

2.1. Study design and data sources

A secondary cross-sectional analysis was conducted on the Encuesta Nacional de Bienestar Autorreportado (ENBIARE) 2021. The survey was developed by the Instituto Nacional de Estadística y Geografía (INEGI) and the data are freely available at the following link: https://www.inegi.org.mx/programas/enbiare/2021/.

For the present study, we used data from the Household Questionnaire, which collects information from the household population residing in the selected dwellings that make up a representative sample, as well as from the Self-Reported Well-Being Questionnaire, which collects information from the adult population chosen from among the members of the households and residing in the selected dwellings.

2.2. Sample size

A stratified, multi-stage cluster sampling was conducted to achieve nationally representativeness. The units of analysis were the residents, aged 18 years and older, of urban and rural households. Trained personnel directly interviewed the selected persons. The ENBIARE database comprises 31,166 individuals. For the present study, those with missing values (e.g., "don't know" or unspecified responses) in any of the study variables were excluded. Specifically, missing values were found for age ($n = 7$), marital status ($n = 5$), educational level ($n = 60$), indigenous mother tongue ($n = 28$), concern about alcohol or drug use in someone with whom they live ($n = 110$), and interpersonal problems with alcohol or drug use in the person being assessed ($n = 55$). After this filter, the effective sample for the present study was 30,901.

2.3. Study variables

2.3.1. Outcome variable

Our dependent variable was the presence of depressive symptomatology during the last week before the application of the survey. For this purpose, the Center for Epidemiologic Studies Depression Scale, brief version (CESD-7) was used (Herrero and Gracia, 2007). This scale was validated for the Mexican population, and the cut-off point which indicates clinically significant symptomatology was defined as a value equal to or >9 points, as it was the one that showed the best characteristics in terms of sensitivity, specificity, ROC curve and predictive values (Salinas-Rodríguez et al., 2013).

2.3.2. Covariates

Sociodemographic variables included biological sex as a binary variable for male and female. Age was defined as a categorical variable with five groups: 18–29, 30–39, 40–49, 50–59, and over 60 years. Marital status was defined as a categorical variable with four mutually exclusive categories: married or cohabiting, separated or divorced, widowed and single. The variable living alone was dichotomous indicating the presence or absence of this characteristic. Educational level was defined as a categorical variable with four groups: elementary school or less, middle school, high school and university. Socioeconomic level was defined as a categorical variable with 3 groups: high, medium and low; to construct this variable, a wealth index was created with a principal component analysis applied to a set of housing characteristics, which served to form tertiles at the household level. Area of residence was defined as a dichotomous variable with urban and rural categories. Recent job loss was defined as a categorical variable with 3 groups (no/yes/yes, but got it back).

We also included data on life and health experiences, such as having a major functional limitation (no/yes), having experienced discrimination in the past 12 months (no/yes), speaking an indigenous language (no/yes); living with a person who has a chronic condition (diabetes, high blood pressure, cancer, disability, etc.) (no/yes), number of recent negative events (none/one/two/three or more), concern about someone in the household's alcohol consumption or drug use (no/yes), interpersonal problems due to own alcohol or drug use (no/yes), physical exercise during the previous week (no/yes), having pets (no/yes), frequent or very frequent use of social networks (no/yes), and having a religion (no/yes). In addition, pandemic-related data such as having been diagnosed with COVID-19 in the past 12 months (no/yes) and whether in the past 12 months a close person was diagnosed with COVID-19 (no/yes) were considered.

2.4. Data analysis

All analyses were performed in the R program (version 4.0.3). The prevalence estimates, as well as the inferential analyses, were conducted considering the complex sample design of the ENBIARE. For this purpose, the *svydesign* function of the *survey* package (version 4.0) was used,

Table 1

Characteristics of the study population.

Variable	n	Weighted % (95 % CI)
Depressive symptomatology		
No	25,845	84.7 (84.1–85.3)
Yes	5056	15.3 (14.7–15.9)
Sex		
Male	14,130	47.1 (46.3–47.9)
Female	16,771	52.9 (52.1–53.7)
Age ($M = 41.68$, $SD = 16.31$)		
18–29	7672	28.6 (27.8–29.5)
30–39	6934	20.6 (19.9–21.3)
40–49	5984	19.2 (18.6–19.9)
50–59	4735	15.7 (15.1–16.3)
≥60	5576	15.8 (15.2–16.5)
Marital status		
Married or in a free union	18,156	60.5 (59.7–61.3)
Separated or divorced	3587	8.6 (8.1–9.0)
Widowed	2096	5.1 (4.7–5.4)
Single	7062	25.8 (25.0–26.6)
Lives alone		
No	27,493	95.4 (95.1–95.6)
Yes	3408	4.6 (4.4–4.9)
Educational level		
Elementary school or less	7601	22.5 (21.7–23.3)
Middle school	9479	30.1 (29.3–30.9)
High school	7048	24.5 (23.7–25.3)
University	6773	22.9 (22.1–23.8)
Socioeconomic status		
High	8473	33.2 (32.2–34.1)
Middle	12,102	37.8 (36.9–38.7)
Low	10,326	29.0 (28.1–30.0)
Area		
Urban	23,597	77.5 (76.8–78.2)
Rural	7304	22.5 (21.8–23.2)
Recent job loss		
No	24,532	78.2 (77.4–78.9)
Yes, but got it back	2107	7.0 (6.5–7.5)
Yes	4262	14.8 (14.2–15.5)
Significant functional limitation		
No	25,777	84.8 (84.2–85.4)
Yes	5124	15.2 (14.6–15.8)
Discrimination in last 12 months		
No	25,296	82.3 (81.7–82.9)
Yes	5605	17.7 (17.1–18.3)
Speaks an indigenous language		
No	29,205	95.6 (94.9–96.2)
Yes	1696	4.4 (3.8–5.1)
Lives with a chronic patient		
No	19,944	58.1 (57.2–59.0)
Yes	10,957	41.9 (41.0–42.8)
Recent negative events		
None	12,884	42.2 (41.3–43.2)
One	10,670	35.4 (34.6–36.3)
Two	4682	14.5 (13.9–15.0)
Three or more	2665	7.9 (7.4–8.3)
Concern about alcohol or drug use of someone at home		
No	24,613	78.0 (77.3–78.7)
Yes	6288	22.0 (21.3–22.7)
Interpersonal problems due to alcohol or drug use		
No	28,641	93.3 (92.9–93.7)
Yes	2260	6.7 (6.3–7.1)
Support from family or friends		
Both family and friends	21,472	69.2 (68.4–70.1)
Family only	7486	25.5 (24.7–26.4)
Friends only	1131	3.0 (2.8–3.3)
None	812	2.2 (2.0–2.5)
Physical exercise		
No	20,066	64.0 (63.1–64.9)
Yes	10,835	36.0 (35.1–36.9)
Has pets		
No	9317	26.6 (25.8–27.3)
Yes	21,584	73.4 (72.7–74.2)
Frequent or very frequent use of social networking		
No	12,370	37.8 (36.9–38.8)
Yes	18,531	62.2 (61.2–63.1)
Has a religion		

Table 1 (*continued*)

Variable	n	Weighted % (95 % CI)
No	5518	18.1 (17.4–18.8)
Yes	25,383	81.9 (81.2–82.6)
COVID-19 diagnosis in last 12 months		
No	26,972	86.8 (86.2–87.4)
Yes	3929	13.2 (12.6–13.8)
COVID-19 diagnosis to a close person		
No	19,592	61.7 (60.8–62.7)
Yes	11,309	38.3 (37.3–39.2)

where the survey design variables (primary sampling unit, stratum and sample weight) were specified. First, we estimated the weighted percentages and their 95 % confidence intervals (CI). Then, the bivariate association between each factor and CSDS was examined using the chi-square test with the Rao-Scott correction. Those variables that had a significant association ($p < .05$) with the outcome were simultaneously entered into a multiple Poisson regression model. In this way, it was possible to estimate adjusted prevalence ratios (*aPR*), as well as their 95 % CIs. This approach is recommended over the traditional calculation of odds ratios, especially when dealing with outcomes with high prevalence such as CSDS (Martinez et al., 2017). In order to assess the possible presence of multicollinearity, the variance inflation factor (VIF) was calculated for this adjusted model. A VIF >5 was considered an alarm signal, while a VIF >10 would indicate a clear problem.

2.5. Ethical considerations

This study is a secondary analysis of publicly available information. The ENBIARE data do not provide information that allows the identification of the participants, so the confidentiality of personal information was assured. For this reason, this study did not require approval by an ethics or institutional committee, since the individuals were not directly involved. On the other hand, it should be noted that the primary data collection of the ENBIARE was carried out in accordance with current national regulations, as considered in the INEGI Code of Ethics and the Law of the National System of Statistical and Geographic Information.

3. Results

3.1. Characteristics of the population

The data analysis included 30,901 individuals (out of a total of 31,166). A total of 265 individuals were excluded because complete data were not available. The mean age was 41.68 years (*SD* = 16.31), and there was a slightly higher proportion of women (52.9 %). The prevalence of depressive symptomatology was 15.3 %. Further details on the characteristics of the population are presented in Table 1.

3.2. Bivariate associations

The results of the associations between sociodemographic characteristics and the presence of depressive symptoms are shown in Table 2. Gender, marital status, living alone, having a lower educational level, having a lower socioeconomic status, living in a rural area, recent job loss, having a significant functional limitation, having suffered discrimination in the past 12 months, living with a person who has a chronic condition, the number of recent negative events, concern about alcohol consumption or drug use by someone in the household, having had interpersonal problems due to alcohol or drug use, lack of frequent or very frequent use of social networks, and having been diagnosed with COVID-19 in the past 12 months were associated with the presence of depressive symptoms. On the other hand, variables such as doing physical exercise and having support from family or friends had a statistically significant association with the absence of depressive symptomatology.

3.3. Multivariable analysis

In the multiple regression analysis, it was observed that the following characteristics were associated with a higher prevalence of CSDS: being female, not being married or cohabiting, living in a rural area, having lost employment and not having recovered it, having a significant functional limitation, having suffered discrimination in the last year, living with a chronic patient, having experienced a greater number of recent negative events, having concerns about someone's substance use at home, having had problems due to one's own substance use, not having social support (especially from family), and having had a diagnosis of COVID-19 in the last year. On the other hand, having a higher educational level and doing physical exercise were related to a lower prevalence of CSDS. Table 3 presents the detailed results of the regression analysis. It should be noted that there were no multicollinearity problems, since in all cases the VIF was <2.

4. Discussion

In the present study, a prevalence of CSDS of 15.3 % was found in the Mexican adult population. This implies an increase with respect to the last national pre-pandemic measurement, conducted in 2018, which indicated a prevalence of 13.6 % (Cerecero-García et al., 2020). However, data obtained during 2020 suggest that at the beginning of the pandemic there was an even more dramatic increase in CSDS, but it tended to decrease over the months (Teruel-Belismelis et al., 2021). Integrating this information, it can be concluded that the onset of the pandemic marked an increase in depressive symptomatology in the Mexican population (27.3 %); by 2021, this had decreased to 15.3 %, which, however, is still above the 13.6 % reported in 2018.

Many of the variables associated with CSDS in the present study are consistent with those found in previous research, both before and during the pandemic. For example, the higher prevalence of depression in women is a finding widely replicated in the literature (Cortés-Álvarez et al., 2020; Ettman et al., 2020; Hajek et al., 2022; Hernández-Vásquez et al., 2020; Yu et al., 2020). Similarly, married or cohabiting individuals have also previously been found to have a lower prevalence of CSDS than separated, divorced or never married individuals (Alzahrani et al., 2022; Cortés-Álvarez et al., 2020; Ettman et al., 2020; Khubchandani et al., 2021; Lee et al., 2022; Xiong et al., 2020; Yu et al., 2020). Also, in our data, it was observed that problems with alcohol or drugs (experienced by oneself or by a close person) were associated with higher CSDS; this is fully in line with what is known in the literature (Pengpid and Peltzer, 2022; Tareke et al., 2022). Lower educational level was also found to be associated with depressive symptoms in this and previous studies (Alzahrani et al., 2022; Kovess-Masfety et al., 2021; Lee et al., 2022; Wang et al., 2020; Xiong et al., 2020; Yu et al., 2020). This finding is of particular relevance for Mexico, which is considered one of the countries with the highest proportion of non-enrollment in the education system (OECD, 2021). Another result, also observed in previous research, is that the prevalence of CSDS is notably higher in people with disabilities or functional limitations (Hernández-Vásquez et al., 2020; Wang et al., 2020). This is of concern, as there are data suggesting that during the COVID-19 pandemic in Latin America, the social and health access gaps suffered by people with disabilities have increased

Table 2
Bivariate associations between exposure variables and outcome.

Variable	Depression (%)		p
	No	Yes	
Sex			<0.001
Male	12,489 (89.3)	1641 (10.7)	
Female	13,356 (80.6)	3415 (19.4)	
Age			0.528
18–29	6426 (84.9)	1246 (15.1)	
30–39	5898 (85.4)	1036 (14.6)	
40–49	5026 (84.8)	958 (15.2)	
50–59	3947 (83.8)	788 (16.2)	
≥60	4548 (84.2)	1028 (15.8)	
Marital status			<0.001
Married or in a free union	15,495 (86.1)	2661 (13.9)	
Separated or divorced	2844 (79.9)	743 (20.1)	
Widowed	1572 (76.3)	524 (23.7)	
Single	5934 (84.6)	1128 (15.4)	
Lives alone			0.011
No	23,036 (84.8)	4457 (15.2)	
Yes	2809 (82.6)	599 (17.4)	
Educational level			<0.001
Elementary school or less	5866 (79.0)	1735 (21.0)	
Middle school	7899 (84.5)	1580 (15.5)	
High school	6059 (86.1)	989 (13.9)	
University	6021 (89.0)	752 (11.0)	
Socioeconomic status			<0.001
High	7380 (87.5)	1093 (12.5)	
Middle	10,125 (84.4)	1977 (15.6)	
Low	8340 (81.8)	1986 (18.2)	
Area			<0.001
Urban	19,945 (85.3)	3652 (14.7)	
Rural	5900 (82.7)	1404 (17.3)	
Recent job loss			<0.001
No	20,829 (86.2)	3703 (13.8)	
Yes, but got it back	1727 (81.4)	380 (18.6)	
Yes	3289 (78.3)	973 (21.7)	
Significant functional limitation			<0.001
No	22,387 (87.7)	3390 (12.3)	
Yes	3458 (68.1)	1666 (31.9)	
Discrimination in last 12 months			<0.001
No	21,791 (87.3)	3505 (12.7)	
Yes	4054 (72.8)	1551 (27.2)	
Speaks an indigenous language			0.062
No	24,457 (84.8)	4748 (15.2)	
Yes	1388 (82.5)	308 (17.5)	
Lives with a chronic patient			<0.001
No	16,940 (86.2)	3004 (13.8)	
Yes	8905 (82.6)	2052 (17.4)	
Recent negative events			<0.001
None	11,524 (90.6)	1360 (9.4)	
One	8925 (84.2)	1745 (15.8)	
Two	3586 (77.0)	1096 (23.0)	
Three or more	1810 (69.4)	855 (30.6)	
Concern about alcohol or drug use of someone at home			<0.001
No	21,008 (86.8)	3605 (13.2)	
Yes	4837 (77.4)	1451 (22.6)	
Interpersonal problems due to alcohol or drug use			<0.001
No	24,223 (85.5)	4418 (14.5)	
Yes	1622 (73.5)	638 (26.5)	
Support from family or friends			<0.001
Both family and friends	18,383 (86.4)	3089 (13.6)	
Family only	6126 (83.1)	1360 (16.9)	
Friends only	780 (71.0)	351 (29.0)	
None	556 (68.1)	256 (31.9)	
Physical exercise			<0.001
No	16,404 (83.2)	3662 (16.8)	
Yes	9441 (87.3)	1394 (12.7)	
Has pets			0.289
No	7811 (85.2)	1506 (14.8)	
Yes	18,034 (84.5)	3550 (15.5)	
Frequent or very frequent use of social networking			<0.001
No	10,061 (82.7)	2309 (17.3)	
Yes	15,784 (85.9)	2747 (14.1)	
Has a religion			0.493
No	4608 (84.3)	910 (15.7)	
Yes	21,237 (84.8)	4146 (15.2)	
COVID-19 diagnosis in last 12 months			<0.001
No	22,660 (85.2)	4312 (14.8)	
Yes	3185 (81.4)	744 (18.6)	

Table 2 (*continued*)

Variable	Depression (%)		p
	No	Yes	
COVID-19 diagnosis of a close person			0.245
No	16,394 (85.0)	3198 (15.0)	
Yes	9451 (84.2)	1858 (15.8)	

(Meresman and Ullmann, 2020).

Other variables show less consistency between studies. Among these, age stands out, which had shown a direct relationship with depression in previous studies (Cerecero-García et al., 2020; Hernández-Vásquez et al., 2020). At the onset of the COVID-19 pandemic, however, a higher prevalence of depression was observed in younger people, especially in the young adult group (Alzahrani et al., 2022; Lupton-Smith et al., 2022; Shah et al., 2021; Wang et al., 2020; Xiong et al., 2020). In the present study, on the other hand, the association was not significant and the prevalence of CSDS was similar in all age groups. This could be because some social restrictions (e.g., online classes) that affected younger people at the onset of the pandemic were still in place during 2021, whereas others (e.g., confinement) had already been lifted (Chadi et al., 2022; Hawke et al., 2021). Thus, the prevalence of CSDS in young adults did not return to its prepandemic baseline, but remained at a level similar to that of the other age groups. This speculation, however, would not explain why greater depressive symptomatology was not observed in older adults, even though they constitute an at-risk group for COVID-19 and, therefore, would be expected to be more prone to depression (Herrera et al., 2021; Raina et al., 2021). Future research should examine, longitudinally, the evolution of depressive symptomatology in this population in different phases of the pandemic, considering the possible role of resilience and social support (Parlapani et al., 2021).

At the beginning of the pandemic, some studies reported a higher prevalence of depression in urban areas (Gao et al., 2020; Özdin and Bayrak Özdin, 2020). This is in contrast to findings prior to the pandemic, which indicate a higher prevalence in rural areas (Cerecero-García et al., 2020; Hernández-Vásquez et al., 2020). One possible explanation is that, at the beginning of the first wave of COVID-19, concern about infection was greater in areas of higher population concentration and commercial activity, which in turn would lead to greater depressive symptoms. On the other hand, by the year 2021, these initial emotional responses had already reversed, so that the differences between urban and rural areas returned to a status similar to pre-pandemic.

Some findings in our study are especially relevant in the context of COVID-19. Notably, one of the variables that presented a stronger association with CSDS was the number of stressful events. This has been observed previously (Ettman et al., 2020) and highlights the need for interventions aimed at reducing the emotional impact of these events (Kovess-Masfety et al., 2021). In relation to the above, it should also be noted that 14.8 % of the population reported having lost their job and not being able to get it back. Moreover, this group of people presented a higher prevalence of CSDS than the rest of the population. In this regard, it is worth mentioning that, although unemployment caused by the pandemic had largely recovered by the end of 2021, the values were still higher than those reported before 2020 (Hernández, 2022). Other findings of relevance in the context of the pandemic were that living with a chronic patient, having little support from family or friends, not doing physical exercise, and having had a diagnosis of COVID-19 in the last year were also significantly and independently associated with depressive symptomatology. In addition to agreeing with previous studies (Alzahrani et al., 2022; Ettman et al., 2020; Hajek et al., 2022; Lee et al., 2022; Qi et al., 2021; Wang et al., 2020; Yu et al., 2020), these results emphasize the need to identify population groups at risk, as well as to promote healthy lifestyles (e.g., physical activity),

stress coping strategies, and support networks in the population. It is also worth mentioning that some of the variables included in our study have been shown to be associated with a longitudinal increase in depression before and during the pandemic. In particular, some data suggest that being female (Fuller-Rowell et al., 2021; Seens et al., 2021; but Ausín et al., 2021) and having experienced a greater number of stressors (Leach et al., 2021) are related to a greater increase in depressive symptomatology.

4.1. Limitations

This study has some limitations. First, the cross-sectional nature of the data makes it impossible for us to make inferences of causality, primarily because of the temporal ambiguity that arises when simultaneously measuring exposure and outcome. Thus, we cannot determine whether exposure to certain changing variables such as recent job loss, recent negative events, frequent use of social networks, or diagnosis of COVID-19 in the past 12 months precede and influence the onset of depressive symptomatology. Second, the self-report method used to measure all study variables may be biased by the respondent's capacity for introspection, memory, lack of motivation to answer the instruments, or social desirability.

Finally, it is worth noting the challenges of using secondary data for the analysis of health problems, since having no control over what is contained in the dataset, the study faces the absence of some variables that could allow a better representation of the population, including the absence of some data on the determinants of mental health such as having physical conditions or pre-existing mental health problems. Future studies should consider more COVID-19-related covariates in the analysis, such as being a prolonged number of days in quarantine, living in an area affected by COVID-19, among others. Despite these limitations, this was a nationally representative sample, which facilitated control for a large number of variables, so these findings allow us to make strong inferences about factors associated with depression during the pandemic in the general population.

4.2. Conclusions

The present study allowed us to identify a set of personal and contextual variables associated with depressive symptomatology during the second year of the COVID-19 pandemic in Mexico. Of particular importance for clinical and healthcare work are those that are, at least in principle, modifiable. For example, unemployment and discrimination are phenomena that can be reduced through public policies. Likewise, the impact of stressful events can be mitigated by the use of appropriate coping strategies, in the training of which psychologists play a fundamental role. On another level, non-modifiable characteristics, such as disability, point to the existence of vulnerable groups towards which health policies designed to improve the quality of life of these people can be directed. In conclusion, our study identified a set of factors relevant to the mental health of the Mexican population, which may be useful for both policy makers and clinicians who work every day in the laudable task of mitigating emotional suffering.

Table 3
Adjusted prevalence ratios obtained from a multiple Poisson regression.

Variable	aPR	95 % CI	p
Sex			
Male	Ref. Group		
Female	1.63	(1.50–1.77)	<0.001
Marital status			
Married or in a free union	Ref. Group		
Separated or divorced	1.16	(1.04–1.30)	0.008
Widowed	1.28	(1.13–1.45)	<0.001
Single	1.27	(1.15–1.39)	<0.001
Lives alone			
No	Ref. Group		
Yes	1.06	(0.94–1.19)	0.320
Educational level			
Elementary school or less	Ref. Group		
Middle school	0.78	(0.71–0.86)	<0.001
High school	0.75	(0.66–0.84)	<0.001
University	0.64	(0.56–0.74)	<0.001
Socioeconomic status			
High	Ref. Group		
Middle	1.07	(0.96–1.18)	0.217
Low	1.06	(0.96–1.19)	0.255
Area			
Urban	Ref. Group		
Rural	1.16	(1.07–1.25)	<0.001
Recent job loss			
No	Ref. Group		
Yes, but got it back	1.05	(0.91–1.21)	0.540
Yes	1.13	(1.03–1.25)	0.012
Significant functional limitation			
No	Ref. Group		
Yes	1.97	(1.82–2.12)	<0.001
Discrimination in last 12 months			
No	Ref. Group		
Yes	1.51	(1.39–1.64)	<0.001
Lives with a chronic patient			
No	Ref. Group		
Yes	1.10	(1.02–1.18)	0.011
Recent negative events			
None	Ref. Group		
One	1.47	(1.33–1.62)	<0.001
Two	1.85	(1.65–2.06)	<0.001
Three or more	2.28	(2.00–2.60)	<0.001
Concern about alcohol or drug use of someone at home			
No	Ref. Group		
Yes	1.35	(1.24–1.46)	<0.001
Interpersonal problems due to alcohol or drug use			
No	Ref. Group		
Yes	1.32	(1.18–1.48)	<0.001
Support from family or friends			
Both family and friends	Ref. Group		
Family only	1.14	(1.05–1.25)	0.002
Friends only	1.49	(1.31–1.70)	<0.001
None	1.66	(1.41–1.97)	<0.001
Physical exercise			
No	Ref. Group		
Yes	0.88	(0.81–0.96)	0.003
Frequent or very frequent use of social networking			
No	Ref. Group		
Yes	0.95	(0.88–1.03)	0.199
COVID-19 diagnosis in last 12 months			
No	Ref. Group		
Yes	1.14	(1.22–1.26)	0.017

CRediT authorship contribution statement

PDV conceived the research idea and analyzed the data. All authors participated in the development of the protocol, data curation, drafting of the manuscript, and all participated in the review and approval of the final manuscript.

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Conflict of Interest

The authors declare that they have no conflicts of interest.

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