Original article

Anxiety, depression and stress levels in survivors COVID patients

Niveles de ansiedad, depresión y estrés en sobrevivientes al COVID-19

Níveis de ansiedade, depressão e stress em sobreviventes da COVID-19

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ABSTRACT | INTRODUCTION: In Mexico, the COVID-19, the prevention measures and the absence of a known standardized treatment, caused different repercussions, not only medical, but also psychological and social in different sectors of the population. At a psychological level, the main repercussions reported were anxiety (due to health issues) and depressive symptoms. **OBJECTIVES:** To analyze the levels of anxiety, depression and stress in a sample of Mexican patients post COVID-19. **METHODS:** Cross-sectional, descriptive – inferential cohort study. The sample consisted of 401 participants, women and men, whose applied a battery of tests consisting of a sociodemographic data sheet and the DASS-21 inventory, through Google Forms. Descriptive, comparative and correlational analyzes were carried out. **RESULTS:** Most of the sample (95.5%) received outpatient management and only 4.5% required hospitalization. Regarding the scores obtained in the DASS 21 inventory, it was found that more than 50% of the population showed severe depression and anxiety and 29.9% presented severe stress. Specifically, significant differences were found in anxiety levels (t=3.07; p=0.002) between men (x= 15.38) and women (x=13.91), as well as positive associations between age with depression (r=0.311; p=0.001), anxiety (r=0.208; p=0.001) and stress (r=0.295; p= 0.001). **CONCLUSIONS:** The need to deepen the study of the psychosocial repercussions to propose comprehensive monitoring programs is discussed.

KEYWORDS: Survivors. COVID-19. Post-Acute COVID-19 Syndrome. Psychology. Health.

RESUMEN | INTRODUCCIÓN: En México, la enfermedad del COVID-19, las medidas de prevención y la ausencia de un tratamiento conocido estandarizado, provocaron repercusiones médicas, psicológicas y sociales en diferentes sectores de la población. A nivel psicológico las principales repercusiones reportadas fueron la ansiedad por la salud y síntomas depresivos. **OBJETIVOS:** Analizar los niveles de ansiedad, depresión y estrés, en una muestra de pacientes mexicanos sobrevivientes al COVID-19. **MÉTODO:** Estudio de cohorte transversal, cuyo nivel de profundización es descriptivo - inferencial. La muestra se seleccionó por muestreo no probabilístico tipo bola de nieve; estuvo constituida por 401 participantes mujeres y hombres, a quienes se aplicó una batería de pruebas conformada por una cédula de datos sociodemográficos y el inventario DASS-21, mediante Google Forms. Se efectuaron análisis de tipo descriptivos, comparativos y correlacionales. **RESULTADOS:** La mayor parte de la muestra (95.5%) recibió un manejo ambulatorio y solo el 4.5% requirió de hospitalización. Respecto a las puntuaciones obtenidas en el inventario DASS 21, se encontró que más del 50% de la población mostraba depresión y ansiedad severos y 29.9% presentó estrés grave. Específicamente, se encontraron diferencias significativas en los niveles de ansiedad (t=3.07; p=0.002) entre hombres (x=15.38) y mujeres (x=13.91), así como asociaciones positivas entre la edad con la depresión (r=0.311; p=0.001), ansiedad (r=0.208; p=0.001) y estrés (r=0.295; p=0.001). **CONCLUSIONES:** Se discute la necesidad de profundizar el estudio de las repercusiones psicosociales para plantear programas integrales de seguimiento.

PALABRAS CLAVE: Sobrevivientes. COVID-19. Síndrome Post Agudo de COVID-19. Psicología. Salud.

Submitted June 25th, 2024, Accepted Oct. 10th, 2024,
Published Nov. 21st, 2024
Revista Psicologia, Diversidade e Saúde, Salvador, 2024;13:e5826
http://dx.doi.org/10.17267/2317-3394rpds.2024.e5826 | ISSN: 2317-3394
Assigned editors: Mônica Daltro, Marilda Castelar

How to cite this article: Guzmán, M. O., Romero, C. P., & Higuera, R. I. N. (2024). Anxiety, depression and stress levels in survivors COVID patients. *Revista Psicologia, Diversidade e Saúde, 13*, e5826. http://dx.doi.org/10.17267/2317-3394rpds.2024.e5826

RESUMO | INTRODUÇÃO: No México, a doença COVID-19, as medidas de prevenção e a ausência de um tratamento padronizado conhecido causaram diferentes repercussões não apenas médicas, mas também psicológicas e sociais em diferentes setores da população. No nível psicológico, as principais repercussões relatadas foram a ansiedade em relação à saúde e os sintomas depressivos. **OBJETIVOS:** analisar os níveis de ansiedade, depressão e estresse em uma amostra de pacientes mexicanos após a COVID-19. **MÉTODOS:** Estudo de coorte transversal, com um nível de profundidade descritivo-inferencial. A amostra foi selecionada por amostragem não probabilística em bola de neve; consistiu em 401 participantes mulheres e homens, aos quais foi aplicada uma bateria de testes composta por um questionário de dados sociodemográficos e o inventário DASS-21 utilizando o Google Forms. Foram realizadas análises descritivas, comparativas e correlacionais. **RESULTADOS:** A maior parte da amostra (95,5%) foi tratada em ambulatório e apenas 4,5% necessitaram de internamento. Em relação às pontuações obtidas no inventário DASS 21, verificou-se que mais de 50% da população apresentou depressão e ansiedade graves e 29,9% apresentaram estresse grave. Especificamente, foram encontradas diferenças significativas nos níveis de ansiedade (t=3.07; p=0.002) entre os homens (x=15.38) e as mulheres (x=13.91), bem como associações positivas entre a idade e a depressão (r=0.311; p=0.001), a ansiedade (r=0.208; p=0.001) e o stress (r=0.295; p=0.001). **CONCLUSÕES:** Discute-se a necessidade de aprofundar o estudo das repercussões psicossociais a fim de propor programas abrangentes de acompanhamento.

PALAVRAS CHAVE: Sobreviventes. COVID-19. Síndrome de COVID-19 Pós-Aguda. Psicologia. Saúde.

Introduction

In early 2020, atypical pneumonia cases were attributed to a coronavirus, which became known worldwide as COVID-19 (Bongyoung et al., 2022; Ruíz & Jiménez, 2020; Zhu et al., 2020). By March 2020, the health emergency due to COVID-19 infection was declared a pandemic, recognizing the importance of preventing and controlling its spread (Caldera-Villalobos et al., 2020; Rodríguez et al., 2020; WHO, 2023a; WHO, 2023b; WHO, 2023c).

With this objective, the Mexican government proposed different strategies such as confinement, the #quédateencasa program, and healthy distance (Gobierno de México, 2020a; Gobierno de México, 2020b, Gobierno de México, 2021a; Gobierno de México, 2021b; Martínez-Anaya et al., 2020; Suárez et al., 2020); it is important to emphasize that the magnitude of the problem and the radical nature of the solutions generated intense public debate, criticism and questioning at different analysis levels (biological, psychological and social) (Barrientos-Gutiérrez et al., 2020; Martínez-Anaya et al., 2020).

Based on the above, different investigations have determined that there are biopsychosocial repercussions from events considered catastrophic, thus according to Haas (2021a, 2021b), the adverse psychological effects derived from a pandemic can be confusion, irritability, post-traumatic stress, fear, stress, depression, health anxiety and fear of disease. In this regard, Brooks et al. (2020) found that people who spent time in isolation during the COVID-19 pandemic showed major depression and anxiety and/or post-traumatic stress disorder symptoms. Similarly, separation from loved ones, loss of freedom to leave home, uncertainty about health, and boredom were conducive to the development of avoidance behaviors, irritability, confusion, frustration, and/or intensified fear (Brooks et al., 2020).

Consequently, COVID-19 patients, COVID-19 survivors and the general population were in an increased state of alertness to disease symptoms, a circumstance that was categorized as health anxiety, which was defined as bodily changes or sensations understood as symptoms of some disease (Haas, 2021a; Haas, 2021b; Huarcaya-Victoria, 2020). This type of anxiety is characterized by catastrophic interpretations of bodily sensations and changes, dysfunctional beliefs about health, and poor adaptive mechanisms (Haas, 2021a; Haas, 2021b; Huarcaya-Victoria, 2020); therefore, it becomes important in terms of coping with the disease because they present behaviors ranging from isolation, restriction of contact with loved ones (friends and family); which, in turn, conditions and exacerbates psychological symptomatology (Haas, 2021a).

On the other hand, according to the Robert Koch Institute (RKI), there are two definitions to consider: prolonged COVID, understood as persistent sequelae or symptoms that occur after the acute period (4 weeks) of SARS-CoV 2 infection and up to week 12, and post-COVID syndrome understood as symptoms that continue to be present at least 12 weeks or more after the acute period of infection (Scharf & Anaya, 2022). Post-COVID-19 is considered a multifactorial condition, it is estimated that 10-35% of patients who have had COVID-19 developed long-term symptoms (Moorjani & Gupta, 2022).

The most common persistent COVID-19 survivors' symptoms are dyspnea, fatigue, general malaise, cognitive impairment, memory problems, cough, chest pain, palpitations, arthralgias, diarrhea, dizziness, sleeping difficulties, and fever (Jacob & Prakash, 2022; Moorjani & Gupta, 2022; Scharf & Anaya, 2022). These symptoms can have an important impact on the individual and social level, mainly in the development of daily activities.

In addition to the above, the Pan American Health Organization (2020) indicated that patients who have suffered from coronavirus not only have physical but also psychological effects, since about one-third of the patients who recovered suffered lasting changes in their mood and/or suffered from anxiety or depression. Therefore, health issues in COVID-19 survivors should be analyzed in two categories: physical conditions and psychological repercussions to find alternatives to evaluate and make better professional decisions and reduce these symptoms (Jacob & Prakash, 2022).

At the psychological level, patients in post-COVID conditions present symptoms such as anxiety, depression, sleep disorders, post-traumatic stress disorder, and mood swings which have a considerable impact on their quality of life (Moorjani & Gupta, 2022; Samper-Pardo et al., 2023).

Different studies have been conducted with the aim of analyzing depression, anxiety and stress levels during confinement, in patients with COVID-19 and patients in post-COVID-19 conditions, in which it was found that these psychological factors levels increased in all participants (Bautista et al., 2020; Galindo-Vázquez et al., 2020; Odriozola-González, 2020; Ozamiz-Etxebarria, 2020; Wang et al., 2020). Bautista et al. (2020) mentioned that in patients surviving COVID-19 stress and anxiety symptoms are maintained due to the perception of symptom persistence and were associated with variables such as marital status and parentality (Bautista et al., 2020).

Based on the above and because Mexico was ranked as one of the three Latin American countries most affected in psychological health derived from the coronavirus (WHO, 2020; WHO/PAHO, 2016; Osorio-Guzmán & Prado, 2021; Osorio & Prado, 2021; Sommantico et al., 2022; Villegas, Osorio & Prado, 2020), the present work was proposed.

Objectives

The objective of the research was to analyze depression, anxiety, and stress levels in a sample of Mexican COVID-19 survivors.

Materials and methods

Participants

A non-probabilistic snowball sampling (Hernández-Sampieri et al., 2010) was performed, from which 401 responses were obtained from participants who had suffered from COVID-19, diagnosed by rapid test or PCR test, from the beginning of the pandemic until the second semester of 2021. Data collection was conducted from March to August 2021.

Participants were recruited through social networks and through an informal network of acquaintances, they were informed about the objectives of the project, the possibility of leaving the research at any time without any repercussions and the average time to answer the survey, all people voluntarily agreed to participate in the research by checking the corresponding box on the form.

Instruments

Questionnaire of Sociodemographic Variables: a questionnaire was designed that included sociodemographic data, clinical variables and pathologic antecedents, such as persons with whom the patient lives, previous illnesses, COVID-19 history, family social support perception and social support perception from health personnel on an analog scale of one to 10, symptoms during the illness, sequelae (temporary, from 3 to 6 months and permanent after 6 months) of COVID-19, among others.

Scales of Depression, Anxiety, and Stress (DASS 21): an instrument composed of 21 Likert-type scale items with four response options ranging from 0 to 3. It consists of three subscales: Depression (items 3, 5, 10, 13, 16, 17 and 21), Anxiety (items 1, 2, 4, 6, 18, 19, and 20) and Stress (items 7, 8, 9, 11, 12, 14 and 15).

The reliability of DASS 21 scale for the Mexican population was 0.81 for the depression scale, 0.79 for the stress scale, 0.76 for the anxiety scale. With a total alpha of 0.86 (Peña et al., 2006; Samper-Pardo et al., 2023).

Procedure

The study was a cross-sectional correlational study. The technique used for data collection due to governmental preventive measures was through Google Forms which was disseminated through virtual platforms and social networks (Hernández-Sampieri et al., 2010).

The sample size was calculated with the software "G. Power 3.1.9.7" considering the parameters of "Effect size", "Error probability (α)" and "Statistical power (1-β)".

It is important to mention that the guidelines of the Ethical Code of the Psychologist of the Mexican Psychology Association and the recommendations of the Helsinki Declaration were considered for the present research. In addition, it was reviewed and approved by the ethics committee of the Facultad de Estudios Superiores Iztacala under official letter number CE/FESI/082021/1413.

Statistical Analysis

A descriptive analysis of the sociodemographic and biopsychosocial variables of the participants was carried out. Likewise, a descriptive analysis of the scores obtained in DASS 21 instrument and of each of the subscale was carried out.

Subsequently, comparisons were made by means of Student's t-tests and ANOVA with Tukey's HSD post hoc comparisons, between sociodemographic variables, as well as symptoms during the disease, temporary sequelae, and permanent sequelae with depression, anxiety, and stress levels measured by the DASS 21 instrument, and associations were calculated by means of Pearson's R between different variables of interest. The analysis was performed using SPSS Stadistics 26 software.

Results

A total of 401 COVID-19 surviving participants responded, with the first case being collected in March 2021. The mean age was 32.62 (SD= 14.04; range 15 to 92 years). 33.2% of the participants were male, and 66.8% were female.

57.1% of the participants were single and 26.9% were married. While 57.9% of the participants reported having no offspring. Regarding educational level, 52.4% of the participants reported having a university education and 22.9% reported having a high school education.

According to the type of employment, 38.9% of the sample reported being employed and 37.7% were students. Regarding the number of people with whom they cohabited, the average was 3.17 (SD = 1.62), most of them cohabited with people from their family nucleus such as wives and children or parents and siblings (85.5%). Other data obtained can be consulted in Table 1.

Table 1. Frequencies and percentages of sociodemographic variables

Marital status		
	Frequency	Percentage
Single	229	57.1%
Married	108	26.9%
Unmarried	36	9.0%
Separated	13	3.2%
Widowed	8	2%
Divorced	7	1.7%
Level education		
University	210	52.4%
High school	92	22.9%
Graduate degree	37	9.2%
Technical career	43	10.7%
High school	15	3.7%
Occupation		
Employed	156	38.9%
Students	151	37.7%
Self – employed	39	9.7%
Housewife	41	10.2%
Retires	10	2.5%
Unemployed	4	1%
Type of employment		
Permanent	148	36.9%
Casual	83	20.7%
Not employed	170	42.4%
Kinship of persons with whom you live with		
Nuclear family	343	85.5%
Extended family	31	7.7%
Friends	12	3.0%
Alone	13	3.2%
Living with high - risk people		
Yes	143	35.7%
No	258	64.3%
Socioeconomic level		
High	3	0.7%
Medium	346	86.3%
Low	52	13%
Means of transportation		
Collective public transportation	159	39.7%
Private public transportation (cab, Uber, taxi)	42	10.5%
Own transportation (car, motorcycle)	200	49.9%
Hospitalization		
Yes	18	4.5%
No	383	95.5%
Hospital		
Public	38	9.5%
Private	46	11.5%

Source: the authors (2024).

When evaluating family social support perception, a mean of 9.16/10 was obtained, which contrasts with the social support perception on the part of health personnel with a mean of 7.78/10.

On the other hand, 100% of the participants reported knowing family members, neighbors, colleagues, and friends who had been infected with COVID-19. 92.3% of the participants knew someone who died from COVID-19, with 1 to 5 people being the most common (58.5%).

Considering that at the time of the survey there were few specific treatment protocols, 35.9% of the participants were treated with aspirin, as seen in Table 2. Furthermore, even though, within the official manuals disseminated, it was mentioned that there was no need to administer antibiotics in the face of viral diseases, 20.2% reported having received them under medical prescription. Regarding the use of oxygen, 2.9% of the participants used respiratory support.

Regarding alternative treatments, 11.5% of the participants used stem cell treatment and chlorine dioxide (see Table 2).

Table 2. Percentage distribution according to pharmacological treatment and alternative treatment

Pharmacological Treatment		
Type of treatment	Frequency	Percentage
Aspirin	144	35.9%
Antibiotic	81	20.2%
Antiretroviral	70	17.5%
Paracetamol	20	5.0%
Oxygen Nasal Prongs	11	2.7%
High Pressure Nasal Prongs	1	0.2%
Alternative Treatment		
Type of treatment	Frequency	Percentage
Stem Cell Treatment	30	7.5%
Chlorine Dioxide	16	4.0%
Homeopathy	14	3.5%
Acupuncture	4	1.0%
Teas	10	2.5%
Treatment with magnets	7	1.7%

Source: the authors (2024).

According to the hygiene and prevention measures, 61.3% of the participants mentioned having increased their hygiene measures and 37.9% indicated that they had not made any modifications.

Symptoms during the illness, temporary sequelae (from 3 months to six months), and permanent sequelae (more than six months) are reported below (see Table 3).

In addition, 92.5% of the participants expressed willingness to be vaccinated. Regarding psychological care, only 21.2% of the participants stated that they had received it and 4% mentioned receiving psychiatric care, where they were prescribed antidepressants and anxiolytics.

Table 3. Percentage distribution according to symptoms during the disease, temporary sequelae, and permanent sequelae

Symptoms during illness		
Symptoms during the disease	**Frequency**	**Percentage**
Dyspnea	167	41.6%
Low saturation	32	8.0%
Fatigue	147	36.7%
Fever	6	1.5%
Headache	11	2.7%
Loss of taste and smell	14	3.5%
Other*	9	3.5%
Temporary sequelae (three to six months)		
Temporary sequelae	**Frequency**	**Percentage**
Dyspnea	106	26.4%
Low saturation	15	3.7%
Fatigue	122	30.4%
Headache	27	6.7%
Loss of taste and smell	31	7.7%
Joint and muscle pain	9	2.2%
Cough	9	2.2%
Difficulty in concentrating	11	2.7%
Other**	21	3.6%
Fear to going out	8	2.0%
Permanent sequelae (more than 6 months)		
Permanent sequelae	**Frequency**	**Percentage**
Dyspnea	46	11.5%
Low saturation	8	2.0%
Fatigue	84	20.9%
Headache	26	6.5%
Loss of taste and smell	29	7.2%
Muscle and joint pain	21	5.2%
Cough	15	3.7%
Difficulty in concentrating	21	5.2%
Fear of going out	12	3.0%
Other***	18	4.4%

*Other: joint and muscle pain, cough, memory loss, diarrhea, and sore throat
**Others: Nervousness, Loss of memory, Fear of exercise, Discomfort due to lack of hygiene, Discomfort due to lack of hygiene
***Others: Fever, Short-term memory loss, Fear of exercising, Fear of sleeping, Discomfort due to lack of hygiene, Nervousness
Source: the authors (2024).

Descriptive analysis of DASS 21 instrument

The frequency distribution of the DASS 21 instrument applied to identify anxiety and stress levels in the population was calculated.

Table 4 shows that more than 90% of the participants presented depression levels, with severe depression being the most frequent (68.5%), followed by major depression (12.1%). Similarly, it can be observed that more than 95% of the participants presented some anxiety symptoms, with severe anxiety being the most frequent (83.3%).

Regarding stress, 80.3% of the population reported stress levels. More than half of the population presented severe (27.3%) or serious severe (43.8%) stress (see Table 4).

Table 4. Depression, stress, and anxiety levels according to DASS 21 results

Category / Levels	Absent	Mild	Moderate	Severe	Serious Severe
Depression	5.8%	3.0%	10.6%	12.1%	68.5%
Anxiety	2.0%	3.5%	3.5%	7.7%	83.3%
Stress	10.1%	5.3%	13.4%	27.3%	43.8%

Source: the authors (2024).

Analysis of differences between groups

Differences between the attributive variables of the sample and the scores obtained in the DASS 21 instrument were calculated using Student's t statistic and ANOVA. The DASS 21 scores were analyzed in relation to the sociodemographic data. With respect to the education level, no significant differences were found. Regarding sex, significant differences were found in anxiety levels (t=3.07; p= 0.002) between men (x= 15.38) and women (x=13.91), with men presenting higher anxiety levels.

Table 5 shows that there were significant differences between single, married, and widowed people. In general terms the single have lower means, being at severe levels, while the married and widowed that have severe levels in the three variables, Depression, Anxiety, and Stress. According to occupation, students obtained lower means in variables, Depression and Stress than housewives, employees, self-workers, and retirees (Table 5).

On the other hand, in the parentality variable, differences were found between people who have children (x= 16.70) and those who do not (x=13.69), with those who have children presenting higher depression levels (t= 5.661; p=0.001). With respect to stress, significant differences were found between people who have children (x= 15.88) and those who do not (x= 13.49), the latter presenting lower stress levels (t= 4.841; p= 0.001).

Treatment during the disease

Regarding treatment during the disease, it is important to highlight that there were significant differences with respect to the variable Stress between those participants who used stem cells as an alternative treatment (x=2.75) and those who did not (x=7.71; t=-1.985; p<0.05). On the other hand, regarding anxiety, there were significant differences in those participants who used stem cells as an alternative treatment (x=2.25) and those who did not (x=7.73; t=-2.56; p<0.01).

Symptoms during

Likewise, according to the ANOVA test, there were significant differences in anxiety levels (F=5.589) in those patients who presented dyspnea (x=12.88) and those who presented low saturation (x=16.18; p= 0.002). Similarly, there was a significant difference in anxiety between participants who presented dyspnea (x=12.88) and those who presented fatigue (x=15.28; p= 0.001).

Temporal Symptoms

Significant differences in stress levels were found in participants who presented dyspnea (x=12.69) and those who did not (x= 15.01; t= -4.578; p= 0.001). On the other hand, significant differences in anxiety levels were found in participants who presented dyspnea (x=13.27) and those who did not (x= 14.93; t=-2.959; p= 0.003).

Permanent Symptoms

As shown in Table 5, there were statistically significant differences in anxiety levels between participants who did or did not present dyspnea, fatigue, and fear of exercise. In turn, significant differences were found in the anxiety levels obtained by participants who presented dyspnea (x= 11.93) and those who presented loss of taste and smell (x= 15.68; t= 3.252; p= 0.031).

Psychological care

A relevant variable for the present study was to consider whether patients had psychological and/or psychiatric care. The data can be seen in Table 5, which shows that those who received psychological or psychiatric care and/ or took psychiatric medication had lower anxiety, stress, and depression levels.

Table 5. Mean and standard deviation of the scores obtained in DASS 21, according to the subgroups of the attributive variables of the sample

Variable	Scale	Depression	Anxiety	Stress
Marital Status	Single	13.59 ± 5.83	13.72±4.84	13.31±5.46
	Married	17.21 ± 3.85	15.48±3.83	16.19±3.55
	Separated	14.53 ± 4.23	14.00±3.69	14.84±4.05
	Divorced	15.57 ± 6.34	13.57±4.92	13.00±7
	Unmarried	16.02 ± 5.15	14.94±4.44	16.38±3.77
	Wildowed	19.00 ± 1.92	17.87±3.68	17.75±3.19
	p	0.001**	0.005**	0.001**
Occupation	Student	12.91±5.96	13.47±4.83	12.69±5.62
	H	16.64±4.07	15.36±3.85	16.65±3.26
	Employee	16.00±5.01	14.77±4.58	15.17±4.63
	SE	16.64±4.42	15.02±4.13	15.74±4.57
	Retired	18.00±2.58	16.30±2.26	17.70±2.79
	p	0.001**	0.040**	0.001**
Permanent sequelae	None	15.82±4.87	16.01±3.43	15.92±3.87
	Dyspnea	14.54±5.88	11.93±5.46	13.45±4.86
	Fatigue	14.61±5.36	13.66±4.88	14.02±5.02
	Fear of exercise	8.25±5.18	8.25±5.73	7.25±4.34
	p	0.293	0.001**	0.019**
Psychological Care	Received	12.48±6.07	12.69 ±4.96	12.08±5.79
	Not Received	15.62±5.08	14.85±4.35	15.14±4.58
	p	0.001**	0.001**	0.001**
Psychiatric Care	Received	7.75±5.49	10.37±4.54	8.12±6.13
	Not received	15.26±5.25	14.56±4.49	14.76±4.79
	p	0.001**	0.001**	0.001**
Psychiatric Medication	Takes	9.98±5.48	10.66±4.40	9.52±5.87
	Not take.	15.24±5.32	14.60±4.49	14.77±4.82
	p	0.001**	0.001**	0.001**

(p) = p- values obtained; (H) = Housewife; (SE) = Self- Employment; *p=0.05; **p=0.01

Souce: the authors (2024).

Correlational analysis

Associations were calculated between the scores of the instrument and the sociodemographic variables of the sample, where it was found that depression was positively correlated with age (r= 0.311; p=0.001), number of children (r= 0. 253; p=0.001), social support level perceived from their family (r= 0.110; p=0.027) and from health personnel (r= 0.136; p=0.007); indicating that while higher age, number of children and social support perception, higher depression level is.

On the other hand, a slight negative correlation was found between the extent of social support networks and depression (r= -0.143; p= 0.004), which shows that while more friends, the depression level is lower

As for anxiety, significant associations were found with age (r= 0.208; p=0.001); and with the number of people with whom the person cohabits (r= -0.136; p=0.007), so it is presumed that while older the person is and fewer number of people with whom he/she cohabits, higher anxiety levels will be.

With respect to stress, positive correlations were found with age (r= 0.295; p= 0.001) and the number of children (r= 0.215; p=0.001); and a negative correlation with the number of friends (r= -0.104; p= 0.037).

Discussion

The onset of the pandemic and its consequences determined a restructuring at the individual and population level of the way of life in the world (confinement, new hygiene measures, use of masks, pause in activities, etc.) (Barrientos-Gutiérrez et al., 2020; Suárez et al., 2020; Gobierno de México, 2020b; Ruíz & Jiménez, 2020; Zhu et al., 2020). Therefore, the present study aimed to analyze depression, anxiety, and stress levels in COVID survivors in a Mexican sample.

Regarding the approximate date of infection, it is emphasized that most of the samples presented it during 2020, when Mexico was beginning to implement prevention and care measures, as well as to progressively identify the scope of the pandemic (Gobierno de México, 2020a; Gobierno de México, 2020b; Gobierno de México, 2021a; Gobierno de México, 2021b; Suárez et al., 2020).

As reported by several authors (Etchevers et al., 2021; Haas, 2021a; Scharf & Anaya, 2022), social, family, and individual restructuring had a significant impact on the psychological health of COVID-19 survivors.

According to the results, more than half of the participants presented moderate or severe depression levels. On the other hand, regarding stress, more than half of the participants presented severe and seriously severe stress levels. While concerning anxiety levels, a portion of the participants reported having mild symptoms, with the highest percentage of severe and seriously severe symptoms (Zhu et al., 2020); this coincides with the research conducted by Ozamiz-Etxebarria et al. (2020), Huarcaya-Victoria (2020), Wang et al. (2020) and Odriozola-González et al. (2020) who found depression, anxiety and stress levels increased as a consequence of confinement and the COVID-19 pandemic (Zhu et al., 2020).

In relation to age, it was found that the younger they were, the higher their depression, stress, and anxiety levels were, which coincides with Huarcaya-Victoria (2020) and Odriozola-González et al. (2020) who report that the experience, and coping strategies and adaptive capacity developed by the adult population served as a protective factor.

Concerning the marital status of the participants, it was observed that single people presented higher depression levels. This may be related to the social support perceived level of family members since, as mentioned by Bautista et al. (2020), perceived social support decreases symptoms of depression, anxiety, and stress.

On the other hand, with respect to marital status, it is highlighted that married and divorced participants were those who presented greater anxiety symptoms, which coincides with Bautista et al. (2020) who point out that COVID-19 survivors present psychological symptoms associated with variables such as marital status and parentality. In addition to the above, differences were found in depression levels concerning parentality, between participants who had children and those who did not, which could be related to the impossibility of reducing activities due to the responsibility with the family, since, as indicated by the WHO (2020), one of the main characteristics of depression is the reduction of activities.

Now, regarding the differences between patients treated at home and patients who received hospital care, although the percentage of the sample with these characteristics was low, it was found that, in both groups, patients reported low perceived social support from health personnel. This coincides with Etchevers et al. (2021), who emphasized that perceived social support is a protective factor for the development of adaptive coping strategies.

An interesting fact regarding the medical treatment required by the participants is that those who experienced a higher anxiety level were those who did not take any alternative treatment, which coincides with authors such as Huarcaya-Victoria et al. (Haas 2021a; Huarcaya-Victoria, 2020; Bautista et al., 2020) who refer that patients who perform activities that favor the feeling of control over their disease (such as alternative treatments) have a lower probability of developing severe symptoms of anxiety in the face of the condition.

Regarding the presence of temporary and permanent symptoms, there were coincidences between symptoms compatible with diagnostic criteria for anxiety, stress and depression. Dyspnea, fear of exercise and nervousness were the main ones related to anxiety and difficulty concentrating, fatigue and pain are the main ones associated with depression (Brooks et al., 2020; Haas, 2021a; Haas, 2021b; Jacob & Prakash, 2022; Moorjani & Gupta, 2022; Scharf & Anaya, 2022).

Another finding is that anxiety and stress levels are associated with temporary and permanent symptoms, but not with symptoms during illness. This may be due to different coping strategies, as mentioned by Huarcaya-Victoria (2020), health anxiety symptoms are related to the way the person copes with the disease, the more developed the coping strategies are, the greater the sense of control and lower the anxiety levels.

Similarly, it is associated with Bautista et al. (2020) who refer that the presence of physical symptoms affects the psychological health of the population. On the other hand, anxiety levels were higher when there was an affection in the development of their activities, as in those who presented symptoms of low saturation and fatigue (Bautista et al., 2020).

Regarding the psychological well-being care, there were significant differences between the participants who received psychological or psychiatric care, as well as those who received psychiatric medication with respect to those who did not, the relevant thing is that those who did attend to their psychological health were those who presented lower depression, anxiety and/or stress levels, which coincides with what was mentioned by PAHO (2020; WHO/PAHO, 2016) organization that mentions that the Latin American population does not pay attention to their psychological health, although it is the most affected by pandemic conditions. As well as the increased sense of control and the search for social support to cope with psychological symptoms and repercussions (Bautista et al., 2020; Haas 2021a; Haas 2021b; Huarcaya-Victoria, 2020). Additionally, strategies have been developed that allow patients with COVID-19, with prolonged COVID-19 and COVID-19 survivors to cope with the psychological repercussions mainly by strengthening protective factors such as: perceived social support (Karadas & Durán, 2021), and the reduction of myths regarding the disease (Bhanot et al., 2021; Samper-Pardo et al., 2023).

Therefore, one of the main elements that can help to improve the psychological well-being of COVID survivors could be the use of informative material that helps to understand the condition, its symptoms, and sequelae to better cope with them (Moorjani & Gupta, 2022).

The first is related to the scope of the study, since it is a cross-sectional study, the findings do not indicate a causal relationship, but rather an association, so its scope is correlational; on the other hand, the type of sampling, since it is non-probabilistic, could become a threat to external validity.

Conclusions

Based on the above, it is concluded that the COVID-19 pandemic provoked a social, family, and individual restructuring that had a significant impact on the psychosocial health of the surviving patients, with repercussions on the reported anxiety, depression, and stress levels.

With respect to the related variables, it was observed that patients who were younger, single, had no children, and did not seek alternative treatments - in general terms- presented higher depression, stress, and anxiety levels. In addition to the above, it was evident in this sample that both those who received outpatient treatment and those who were hospitalized reported a low social support perception from the health personnel who attended them, this being a cross-cutting need.

A fundamental finding of the research was that COVID-19 survivors who received psychological or psychiatric care were those who presented lower depression, anxiety, and/or stress levels, which highlights the importance of a comprehensive treatment that includes biopsychosocial aspects related to the disease. Therefore, it is considered that these data provide the basis for multidisciplinary intervention, since it is known that depression, anxiety, and stress do not disappear spontaneously, so it will be necessary to develop intervention programs.

Based on the above, it is considered necessary to design interventions that favor the increase of coping skills, which allow patients with depression, stress, or anxiety symptoms to develop protective factors for adaptation to the disease process. A proposal to extend the present investigation would be to investigate the variables related to coping strategies that would allow us to analyze the resources available to the patients and the relationship with anxiety, depression, and stress levels. The "official" declaration that the pandemic is over does not indicate that the problems caused by the pandemic are not worsening or disappearing.

Author contributions

The authors declared having made substantial contributions to the work in terms of the conception or design of the research; the acquisition, analysis, or interpretation of data for the work; and writing or critically reviewing relevant intellectual content. All authors approved the definitive version to be published and agreed to take public responsibility for all aspects of the study.

Conflicts of interest

No financial, legal, or political conflicts involving third parties (government, corporations, private foundations, etc.) have been declared for any aspect of the submitted work (including, but not limited to, grants and funding, advisory board participation, study design), manuscript preparation, statistical analysis, etc.).

Indexers

The Revista de Psicologia, Diversidade e Saúde is indexed in DOAJ, EBSCO and LILACS.

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