Symptoms of anxiety and depression and self-care behaviors during the COVID-19 pandemic in the general population

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Abstract

Introduction: The COVID-19 pandemic can have important psychosocial consequences in the population. **Objective:** To determine the levels anxiety and depression symptoms and self-care behaviors during the COVID-19 pandemic in the general population. **Method:** Online survey distributed over three weeks using a non-probability sampling. The PHQ-9 Patient Health Questionnaire, the GAD-7 Generalized Anxiety Disorder Scale and a self-care behaviors visual analogue scale were used. Between-group (anxiety and depression) descriptive and comparison analyses were carried out. **Results:** Out of 1508 included participants, 20.8 % had symptoms of severe anxiety, while 27.5 % showed symptoms of severe depression. Being a woman, being single, having no children, having medical comorbidities and a history of mental health care were associated with the presence of higher levels of anxiety and depression symptoms; 66 to 80 % of the population complied with self-care recommendations. A need for receiving mental health care was identified in our study population. **Conclusion:** A larger number of individuals with moderate to severe anxiety and depression symptoms were observed than in other pandemics. COVID-19 pandemic psychological effects are considered an emerging public mental health problem, and implementation of programs for their care is therefore recommended.

KEY WORDS: Anxiety. COVID-19. Depression. Pandemic.

Síntomas de ansiedad, depresión y conductas de autocuidado durante la pandemia de COVID-19 en la población general

Resumen

Introducción: La pandemia por COVID-19 puede tener consecuencias psicosociales importantes en la población. **Objetivo:** Determinar los niveles de síntomas de ansiedad, depresión y conductas de autocuidado durante la pandemia de COVID-19 en población general. **Método:** Encuesta en línea distribuida durante tres semanas mediante muestreo no probabilístico. Se empleó el Cuestionario sobre la Salud del Paciente PHQ-9, la Escala del Trastorno de Ansiedad Generalizada GAD-7 y la Escala análoga visual de conductas de autocuidado. Se realizaron análisis descriptivos y de comparación entre los grupos con ansiedad y depresión. **Resultados:** Se incluyeron 1508 participantes, 20.8 % presentó síntomas de ansiedad grave y 27.5 %, síntomas de depresión grave. Ser mujer, soltero(a) no tener hijos, presentar comorbilidad médica y antecedentes de atención a la salud mental estuvieron relacionados con la presencia de mayores niveles de síntomas de ansiedad

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y depresión; 66 a 80 % de la población cumplía con las recomendaciones de autocuidado. Se identificó la necesidad de recibir atención de salud mental. **Conclusión:** Se observó mayor número de individuos con síntomas de ansiedad y depresión moderadas a graves que en otras pandemias. Los efectos psicológicos de la pandemia de COVID-19 se consideran un problema de salud mental pública emergente, por lo que se recomienda la implementación de programas para su atención.

PALABRAS CLAVE: Ansiedad. COVID-19. Depresión. Pandemia.

Introduction

The COVID-19 pandemic has brought not only the risk of transmission and infection-related death, but also important psychological effects.¹ Psychological factors are known to play a vital role in the success of public health strategies that are used to control epidemics and pandemics, as well as in the communication of risks, vaccination and antiviral therapy, hygiene practices and social distancing.²⁻⁴

Pandemics, such as that of severe acute respiratory syndrome (SARS), have been reported to be stressful situations that threaten physical health and psychological well-being, in addition to causing disruptions in interpersonal functioning and the perception that transmission is relatively uncontrollable even when measures that reduce the risk are taken (for example, wearing masks, avoiding crowds).⁵

In viral outbreaks, a person with severe anxiety can misinterpret benign muscle aches or cough as signs of infection, as well as developing maladaptive behaviors such as compulsive handwashing, social withdrawal and panic shopping, which can have negative consequences for the individual and his/her community. For example, a sense of urgency for products that are needed for quarantine can lead to overspending in the storage of resources and harm to the community, which needs such resources for other purposes, including medical care.³ On the other hand, people who consider themselves to be at low risk of infection are unlikely to change their behavior and follow the social distancing recommendations, with the consequent negative impact on efforts to mitigate the dissemination of the virus.

With regard to reported psychological symptoms, mild anxiety was identified in 21.3 % of 7143 college students exposed to COVID-19; in 2.7 %, moderate anxiety, and in 0.9 %, severe anxiety. Living in urban areas and with the parents were protective factors against anxiety. Having relatives or acquaintances infected with COVID-19, unstable financial situation and backlog in academic activities were associated with higher anxiety ($p < 0.001$). Social support was

negatively correlated with the level of anxiety ($p < 0.001$).¹

Moderate to severe or severe anxiety and/or depression symptoms were identified in 35 % of 180 SARS survivors one month after recovery. Health workers or those who had relatives who died because of SARS were more likely to develop high levels of distress.⁶

When hospital health workers ($n = 82$) were compared during the peak of the epidemic with hospital staff who recovered from SARS ($n = 97$), both groups were found to have the same level of concern about infecting others (especially their family members). Workers were more afraid of infection; in survivors, SARS-related fear was correlated with post-traumatic stress symptoms; in addition, they expressed concern about other health problems and discrimination ($p < 0.05$).⁷ People who have experienced public health emergencies have varying degrees of stress, even after the event has ended or they have recovered and been discharged from hospital.^{6,8}

Taking into account social interaction restrictions and confinement measures, mental health services have adopted the use of hotlines, mobile application platforms, the internet and social networks to share strategies for dealing with stress,⁹ as well as for assessing the psychosocial impact on exposed population. Therefore, the purpose of this research was to determine the levels of anxiety and depression symptoms, as well as self-care behaviors, during the COVID-19 pandemic in the general population.

Method

A non-experimental, cross-sectional study was carried out,¹⁰ for which an online survey was conducted using a non-probabilistic convenience sampling; 1508 male and female participants from Mexico and abroad were included. As inclusion criteria, a minimum age of 12 years and knowing how to read and write were considered. Individuals with cognitive impairment that prevented them from answering the survey were excluded, and those who during or after completing the

survey decided not to continue participating were removed from the investigation.

An identification card was designed, which included sociodemographic and clinical data. The following evaluation instruments were used:

- *Patient Health Questionnaire-9 (PHQ-9)*. The Patient Health Questionnaire-9 (PHQ-9), developed by Kroenke et al. in 2001,¹¹ is a screening tool that assesses the possible presence of major depressive disorder and the severity of depression symptoms. Its structure is one-dimensional, it has nine items based on Statistical Manual of Mental Disorders, Fourth edition, Text Revision (DSM IV TR) criteria and a global Cronbach's alpha of 0.89. It was validated in the Mexican population,* with an internal consistency of 0.86 and an explained variance of 47 %.
- *Generalized Anxiety Disorder-7 Scale (GAD-7)*. Developed by Spitzer et al. in 2006,¹² it is a screening tool that assesses the presence of possible generalized anxiety disorder. It has a one-dimensional structure of seven items based on DSM IV TR criteria, which explain 63 % of variance, and a global Cronbach's alpha of 0.92. It was validated in the Mexican population,* with an internal consistency of 0.88 and an explained variance of 57.72 %.
- *Self-care behaviors visual analogue scale*. Behaviors were assessed using a 10-point visual analogue scale, where 0 means "I do not follow the recommendation at all" and 10 means "I follow the recommendation all the time", which specify how individuals carried out self-care strategies.

Sample collection was carried out from March 26 to April 12, 2020. The purpose of the investigation, its procedure, data confidentiality, as well possible risks and benefits, were explained to each participant by electronic means. All individuals voluntarily participated and granted written consent. The procedures of this investigation complied with the provisions of the Declaration of Helsinki with regard to research in human subjects.

Data were analyzed with SPSS version 22.0. Descriptive analysis of central tendency and dispersion

measures was carried out to illustrate demographic and clinical characteristics, as well as univariate analysis to identify the differences between sociodemographic variables and the level of anxiety and depression symptoms. Normality of variables was determined by means of Kolmogorov-Smirnov goodness-of-fit test ($p < 0.001$), whereby a non-normal distribution was observed; therefore, medians and non-parametric Mann-Whitney U and Kruskal-Wallis tests were used.¹³ Finally, Pearson's correlation analysis was carried out. A p-value < 0.05 was established as statistically significant.

Results

As it can be observed in Table 1, total sample consisted of 1508 participants, 1,123 women and 385 men, with an average age of 34 years; 61.3 % were childless, 50.8 % were single, 55.2 % had a college degree, 35.6 % worked as professionals and 24 % referred having some chronic degenerative disease.

Different behavioral areas related to the contingency and its psychosocial consequences were explored. Most participants (92 %) referred that they would undergo the test for COVID-19 detection, whereas 90 % did not have any relative or friend with the virus infection at that moment.

Regarding self-care behaviors, adequate adherence to recommendations stood out, since 80 % complied with not attending meetings or crowded places, 88 % frequently washed or disinfected their hands, 66 % kept the recommended distance (1.5 to 2 m) and 72 % stayed home.

As for coping strategies, 41 % cared little about getting sick, approximately 15 % were frequently worried about getting the disease, while 31 % continually analyzed their bodily sensations, interpreting them as symptoms of the disease. Half the participants frequently used past stressing experience strategies to reduce fear and generated a list of activities to stay active; the same percentage claimed that they maintained an optimistic and objective attitude towards the situation, as well as to have support networks to talk and solve problems (Table 2).

As regards specific needs to face the current health problem, 68 % answered that having information about the disease was essential, as well as knowing the health institutions they can attend and covering the economic needs for subsistence; 34 % considered it necessary for the psychological aspect to be taken care of (Figure 1).

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Table 1. Characteristics of the surveyed individuals with regard to symptoms of depression and anxiety during the COVID-19 pandemic (n = 1508)

Age (years)			Mean = 34.46; range 18-82		
	n	%		n	%
Gender			Level of education		
Females	1123	74.5	Basic education	34	2.3
Males	385	25.5	High school	209	13.9
Country	1421	94.2	College degree	833	55.2
			Postgraduate	406	26.9
			Other	26	1.7
Other	87	5.8			
Marital status			Occupation		
Single	817	54.2	Homemaker	58	5.8
Married	397	26.3	Student	256	25.6
Widower	17	1.1	Employee	254	25.4
Divorced or separated	111	7.4	Unemployed	48	4.8
Cohabitation	157	10.4	Professional	356	5.6
Other	9	0.6	Retired	27	2.7
Paternity			Residence in Mexico (n = 1426)		
Yes	583	38.7	Mexico City	688	42.8
No	925	61.3	State of Mexico	265	18.6
Medical comorbidity (n = 417)			Other states	473	33.2
			Disease		
			Yes	400	26.5
			No	1108	73.5
			Health insurance		
			Yes	1035	68.6
			No	473	31.4
			Prior mental health care		
			Yes	929	61.6
			No	579	38.4

Figure 1. Perceived aspects for adapting to the COVID-19 pandemic.

The anxiety and depression symptom scores had means of 12.35 and 14.4, respectively. The fact that 20.8 % had symptoms of severe anxiety, and 27.5 %, of severe depression, stood out (Table 3). Participants without children, with medical conditions and a history of mental health care were observed to have higher levels of depression and anxiety ($p < 0.001$). Specifically,

the female gender reported higher levels of anxiety, and single individuals, higher levels of depression ($p < 0.001$) (Tables 4 and 5).

It should be noted that there may be variability in each country's data, since the survey was conducted at different times according to the epidemiological phase of each nation. However, 88.4 % of participants

Table 2. Coping and self-care behaviors in the face of the COVID-19 pandemic in surveyed individuals with regard to symptoms of depression and anxiety

	Never		Rarely		Frequently		Almost always		Always	
	n	%	n	%	n	%	n	%	n	%
How often do you worry about getting infected with COVID-19?	7.4	6.9	629	41.7	523	34.7	164	10.9	81	5.4
Are you continually analyzing and interpreting your bodily sensations as symptoms of disease?	329	21.8	704	46.7	340	22.5	84	5.6	51	3.4
Do you feel frustrated by the effects COVID-19 has had on your life?	207	13.7	585	38.8	436	28.9	185	12.3	95	6.3
When you are afraid, do you rely on experiences you have had in similar situations to reduce fear?	140	9.3	361	23.9	437	29.0	365	24.2	205	13.6
You generate a list of daily activities and try to keep busy	138	9.2	302	20.0	390	25.9	390	25.9	288	19.1
You maintain an optimistic and objective attitude towards the situation	20	1.3	134	8.9	423	28.1	521	34.5	410	27.2
You have someone you can lean on or with whom you can talk about your problems	40	2.7	200	13.3	244	16.2	341	22.6	683	45.3
	Visual analogue scale score									
	0-1		2-3		4-5		6-7		8-10	
	n	%	n	%	n	%	n	%	n	%
How much have you followed the following recommendations?										
– Not attending social gatherings or crowded places	44	2.9	44	2.9	82	5.4	92	6.8	1236	82.0
– Washing or disinfecting your hands frequently	10	0.7	12	0.8	40	2.7	97	6.4	1349	89.4
– Keeping at least 1.5 m away from other people	64	4.3	46	3.3	167	11.1	225	26.3	1006	66.8
– Staying home	97	6.5	49	3.3	120	7.9	123	8.8	1109	73.0

Table 3. Level of COVID-19 pandemic-derived anxiety and depression

Anxiety			Depression		
Level	n	%	Level	n	%
Minimal	525	34.8	Minimal	598	39.7
Mild	253	16.8	Mild	337	22.3
Moderate	416	27.6	Moderate	158	10.5
Severe	314	20.8	Severe	415	27.5
Total	1508	100.0	Total	1508	100.0

considered that they will experience negative repercussions in their individual economy.

A positive, middle-magnitude and statistically significant correlation was identified (Pearson's $r = 0.721$, $p < 0.001$), between the levels of depression and anxiety symptoms.

Discussion

The main strategies to fight coronavirus COVID-19 transmission involve self-care behaviors, which should

be approached from a psychological perspective, since they require modification or implementation of behaviors in people who apparently have no immediate reinforcing mechanisms, which complicates their execution.

Higher levels of anxiety and depression were identified than those reported in the SARS and influenza pandemics, which denotes a larger effect on general population mental health. Belonging to the female gender, not having children, a single marital status, medical comorbidity and a history of mental health care coincided with the variables indicated in the literature as being related to the presence of greater psychological symptoms; in addition, economic concerns, repercussions of the pandemic on daily life and academic backlog were identified.¹ The presence of a medical condition was reported by 26.5 % of the sample, mainly of a cardiometabolic nature, which means that this group is at higher risk of becoming seriously ill with COVID-19¹⁴, and during the pandemic it might face difficulties for obtaining adequate treatment.⁹

One possible explanation for high levels of anxiety and depression is high exposure to information about COVID-19, which Avithey associates with constant

Table 4. Sociodemographic variables comparison between participants with symptoms of anxiety (n = 1508)

Variable	GAD-7 score										p
	Minimal		Mild		Moderate		Severe		Total		
	n	%	n	%	n	%	n	%	n	%	
Gender											
Females	352	67	199	78.7	316	76	256	81.5	1123	74.5	< 0.001
Males	173	33	54	21.3	100	24	58	18.5	385	25.5	
Paternity											
Yes	223	42.5	98	38.7	158	38	104	33.1	583	38.7	0.008
No	302	57.5	155	61.3	258	62	210	66.9	925	61.3	
Marital status											
Single	268	51	142	56.1	215	51.7	192	61.1	817	54.2	0.151
Married	145	27.6	71	28.1	112	26.9	69	22.0	397	26.3	
Widowed	9	1.7	3	1.2	4	1.0	1	0.3	17	1.1	
Divorced/separated	40	7.6	19	7.5	28	6.7	24	7.6	111	7.4	
Cohabitation	60	11.4	17	6.7	54	13	26	8.3	157	10.4	
Other	3	0.6	1	0.4	3	0.7	2	0.6	9	0.6	
Disease											
Yes	105	20	58	22.9	105	25.2	132	42	400	26.5	< 0.001
No	420	80	195	77.1	311	74.8	182	58	1108	73.5	
Place of residence											
Mexico City	237	48	122	50.6	178	45.3	151	50.7	688	48.2	0.645
State of Mexico	87	17.6	45	18.7	75	19.1	58	19.5	265	18.6	
Another state	170	34.4	74	30.7	140	35.6	89	29.9	473	33.2	
Medical insurance											
Yes	348	66.3	180	71.1	278	66.8	229	72.9	1035	68.6	0.120
No	177	33.7	73	28.9	138	33.2	85	27.1	473	31.4	
Previous mental health care											
Yes	265	50.5	155	61.3	274	65.9	235	74.8	929	61.6	< 0.001
No	260	49.5	98	38.7	142	34.1	79	25.2	579	34.8	

GAD-7 = Generalized Anxiety Disorder-7.

exposure to overwhelming news headlines and misinformation.¹⁵

A need for general information about the health institutions people can resort to was identified, as well as concern about the effects of the COVID-19 pandemic on the economy. Family income instability or decrease has been identified as a significant factor in anxiety during the crisis.¹⁶

Even though acceptable adherence to health recommendations was recorded in the present study, 5.8 % did not stay away from meetings, 7.4 % did not keep appropriate distance from people and 9.8 % continued to leave home, a situation that entails repercussions on public health, since dissemination and transmission of the virus increases inasmuch as confinement and social distancing strategies are not followed.

Finally, although adequate psychological strategies to cope with the COVID-19 pandemic were identified, half the participants did not have such tools or

conditions to adapt to the situation; therefore, it is necessary to focus on the population particular needs and cover them to help improve coping strategies. Receiving mental health care was considered necessary by 24 % of participants; however, 72 % did not have any remote care service, either by phone or online.

It is relevant to consider recommendations such as those reported by Li,⁹ who claims that the population exposed to COVID-19 can be classified in four levels:

1. People who are more vulnerable to mental health problems, such as hospitalized patients with confirmed infection or serious physical condition, frontline health professionals, and administrative personnel.
2. Isolated patients and in clinics with atypical infection symptoms.
3. Individuals with level 1 and 2 contacts, i.e., family members, colleagues, friends, and rescue workers.

Table 5. Sociodemographic variables comparison between participants with symptoms of depression (n = 1508)

Variable	PHQ-9 score										p
	Minimum		Mild		Moderate		Severe		Total		
	n	%	n	%	n	%	n	%	n	%	
Gender											
Females	429	71.7	247	73.3	127	80.4	320	77.1	1123	74.5	0.024
Males	169	28.3	90	26.7	31	19.6	95	22.9	385	25.5	
Paternity											
Yes	285	47.7	124	36.8	51	32.3	123	29.6	583	38.7	< 0.001
No	313	52.3	213	63.2	107	67.7	292	70.4	925	61.3	
Marital status											
Single	274	45.8	175	51.9	95	60.1	273	65.8	817	54.2	< 0.001
Married	196	32.8	94	27.9	39	24.7	68	16.4	397	26.3	
Widowed	10	1.7	1	0.3	0	0.0	6	1.4	17	1.1	
Divorced/separated	45	7.5	23	6.8	9	5.7	34	8.2	111	7.4	
Cohabitation	69	11.5	42	12.5	14	8.9	32	7.7	157	10.4	
Other	4	0.7	2	0.6	1	0.6	2	0.5	9	0.6	
Disease											
Yes	117	19.6	80	23.7	46	29.1	157	37.8	400	26.5	< 0.001
No	481	80.4	257	76.3	112	70.9	258	62.2	1108	73.5	
Place of residence											
Mexico City	278	48.7	149	47.2	67	46.5	194	49.1	688	48.2	0.173
State of Mexico	95	16.6	54	17.1	39	27.1	77	19.5	265	18.6	
Another state	198	34.7	113	35.8	38	26.4	124	31.4	473	33.2	
Health insurance											
Yes	421	70.4	232	68.8	113	71.5	269	64.8	1035	68.6	0.100
No	177	29.6	105	31.2	45	28.5	146	35.2	473	31.4	
Prior mental health care											
Yes	296	49.5	224	66.5	106	67.1	303	73	929	61.6	< 0.001
No	302	50.5	113	33.5	52	32.9	112	27	579	38.4	

PHQ-9 = Patient Health Questionnaire-9.

4. People affected by epidemic prevention and control measures, susceptible people and the general population.

Among the limitations, it should be noted that the sample was collected by convenience and that a cross-sectional research design was used; therefore, making a prospective follow-up is suggested, which will allow changes in symptoms and safety measures to be observed as the public health situation is modified.

Conclusions

Mental health problems in the general population during the COVID-19 pandemic represent a challenge for the public health system; therefore valid and reliable psychosocial interventions are required to timely identify the onset and intensity of symptoms of depression and anxiety, as well as to assess the effects of clinical and community psychosocial interventions.

Conflict of interests

The authors declare that they have no conflicts of interest.

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Ethical disclosure

Protection of people and animals. The authors declare that no experiments were performed on humans or animals for this research.

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