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Depressive symptomatology in adults during the COVID-19 pandemic

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ABSTRACT

Depression entails changes in the mental health of individuals worldwide. Episodes of depression lead to mood swings and changes in the motivational dimension. Our research focused on the prevalence of depression in the adult population and on how it affected the social and affective dimensions. Owing to the current pandemic, we deemed it necessary to explore how protective measures against COVID-19 infection, such as quarantines, could be related to mental health. Moreover, we found it important to determine the prevalence of depressive and anxious symptomatology in adults from the Valle del Cauca region in Colombia during the social isolation connected to COVID-19. Our study was descriptive, analytical and cross-sectional, and involved 1248 subjects. As tools, we used the Hamilton Depression Rating Scale and the Hamilton Anxiety Rating Scale. The data demonstrated that women were more likely to display symptoms of depression and that individuals aged between 24 and 29 were less likely to reveal symptoms of anxiety than those aged between 18 and 23. Moreover, childless or economically dependent individuals proved to be more likely to display symptoms of depression during the pandemic.

INTRODUCTION

From a sociodemographic perspective, depression is one of the most frequent mental pathologies that affect many individuals worldwide. Research suggests that depression may have a considerable impact on the work and academic performance of adults who suffer from it, as well as on the social and affective adjustments in their everyday interactions.^{1–5} It is important to consider that aspects such as gender, level of economic development of a region and type of data collection instrument could influence the characterization of depression prevalence results in certain contexts.⁶

The new coronavirus (COVID-19) is a severe respiratory syndrome that was discovered in 2019 in Wuhan, Hubei.⁷ COVID-19 spread rapidly around the world, and to prevent its spread quarantine was declared, accompanied

Significance of this study

What is already known about this subject?

- ▶ The tendency to manifest depression and anxiety is not only related to the COVID-19 health emergency.
- ▶ The prevalence of depression and anxiety is higher and more frequent in women than in men.
- ▶ Older adults are less likely to develop depressive symptomatology than younger adults.

What are the new findings?

- ▶ There is a very strong positive correlation between anxiety and depression.
- ▶ Young adults between the ages of 18 and 23 tend to have higher scores on the depression and anxiety scales.
- ▶ Depression and anxiety scores are higher in young adults who are financially dependent.
- ▶ Subjects without children have a greater tendency to be depressed, which suggests that having children is a protective factor against this symptomatology.

by strict control measures including social isolation at home, travel bans and even city closures.^{8–12} These events resulted to some extent in the abrupt interruption of daily activities, reduced physical activity and decreased social interaction. Thus, individuals had to adapt to major changes such as studying and working from home, as well as adjusting their roles (eg, assuming the role of caregiver), financial crisis due to increased expenses, unemployment or decreased income, among others.

This resulted in some people experiencing psychological alterations such as depressive and anxiety symptoms, delirium, and sleep disturbances, especially COVID-19-positive individuals, people close to them or those suspected of having the disease, creating panic and anxiety around them.^{13–16} Because COVID-19 is a disease that may threaten the lives of those who



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Significance of this study

How might these results change the focus of research or clinical practice?

- ▶ The statistical information reported in this study is useful for further research investigating psychological well-being and public health in the context of times of isolation due to health emergencies.
- ▶ Early detection of these symptomatology could contribute to prompt and timely psychological intervention in the face of future health emergencies.
- ▶ Considering sociodemographic information that contributes to the recognition of the level of financial autonomy of individuals can be very useful to identify age groups that are at greater risk of presenting depressive and anxious symptoms.
- ▶ Given the possibility of being exposed to health emergencies related to pandemics that involve periods of isolation, it is important to promote financial empowerment skills that allow individuals to feel more autonomous and productive, which can contribute to the preservation of their mental health.

suffer from it, exploring aspects of mental health associated with this disease is of considerable interest.

With respect to the educational environment involving students in colleges and universities, the current pandemic situation has had a great impact on learning methodologies, with students even reporting anxiety while taking examinations and online classes and concern about lack of financial resources to access online educational platforms.^{17 18} With respect to high school students in China, it has been concluded that aspects such as frequency of physical exercise, alcohol consumption, having family or friends who have been infected, quarantines, routine temperature taking, use of masks and taking final examinations related to reopening in the period of the COVID-19 pandemic are described as the main influencing factors that exacerbate anxious or depressive symptomatology.¹⁹

A recent study in Hong Kong suggests that high levels of anxiety during the COVID-19 pandemic are strongly associated with functional impairment, alcohol use, drug abuse, negative religious coping, extreme hopelessness and suicidal ideation.^{20 21} Indeed, relatively high rates of anxiety symptoms (6.33%–50.9%), depression (14.6%–48.3%), post-traumatic stress disorder (7%–53.8%), psychological distress (34.43%–38%) and stress (8.1%–81.9%) have been reported during the COVID-19 pandemic in the general population in China, Spain, Italy, Iran, USA, Turkey, Nepal and Denmark. In addition, it has been established that risk factors associated with distress levels have to do with female gender, younger age group (≤ 40 years), presence of chronic/psychiatric diseases, unemployment, student status and frequent exposure to COVID-19-related news transmitted by the media.²²

However, the amount of information the individual receives about the impact of COVID-19 and the dimension of individual perceptions are also assumed to be important, as reported in a cross-sectional investigation carried out with individuals from eight countries (China, Vietnam,

Philippines, Spain, Poland, Iran, USA and Pakistan). The results showed that Poland and the Philippines were the two countries with the highest levels of anxiety, depression and stress; on the contrary, Vietnam had the lowest mean scores in these areas. The study demonstrates that the need for health information and the perceived impact of the pandemic were sequential mediators between physical symptoms resembling COVID-19 infection (predictor) and subsequent mental health status (outcome). Thus, they conclude that excessive and contradictory health information could increase the perceived impact of the pandemic.²³

Although it has been reported that manifestations such as pandemic-related stress and distress can, in certain cases, cease without any intervention, those individuals who exhibit severe levels of distress or generalized anxiety may require interventions centered on psychological therapy. Similarly, it is necessary to resort to forms of psychological therapy in those subjects who present major depression or post-traumatic stress due to the death of a loved one or other traumatic events linked to the time of the pandemic.^{20 24}

Because of the potential impact of this pandemic, it becomes necessary to determine the prevalence of symptoms of depression and anxiety in adults during the social isolation related to COVID-19. Moreover, it is important to identify people's perception of the impact that this isolation has on their moods, as well as establish a link between depression, anxiety and specific sociodemographic aspects.

In the early days of the pandemic, most studies that tackled the potential link between mental health and the COVID-19 pandemic involved populations from China or the Middle East.^{8 9 12 25–29} However, there are now studies that even compare aspects related to depressive and anxious symptomatology between continents, as is the case in China and Spain. In this study, Spanish subjects reported significantly more COVID-19 infection-like symptoms, higher perceived risk of contracting COVID-19, frequent use of medical services and less trust in medical services compared with their Chinese counterparts. Similarly, Spanish subjects reported significantly higher stress and depression scores.³⁰

On the other hand, the effects of the use of biosecurity measures such as mouth masks on physical and mental health have also been studied. In this regard, the use of face masks at the community level can safeguard better physical and mental health during the COVID-19 pandemic, so health education with scientific information from the Polish health authorities on the proper use of face masks and reducing social stigma is necessary.³¹

In our research, we used depression and anxiety scales to determine the prevalence of depressive and anxious symptomatology in the adult population of Valle del Cauca. Our study contributes knowledge on adults' current mental state and provides critical information on how to devise strategies meant to support people and help them fight against psychological, psychiatric, pedagogical and social issues.

Depression and anxiety

Both depression and anxiety entail a series of changes that affect an individual's mental health and occur among a considerable percentage of the global population. Typical episodes of depression or anxiety include depressive moods, as well as a decrease in a person's level of motivation, which

Table 1 Distribution of subjects according to sociodemographic variables of interest

Sociodemographic variable	Total, N=1248
Sex	
Male	349 (27.96)
Female	899 (72.04)
Age (years)	
18–23	849 (68.03)
24–29	215 (17.23)
30–39	104 (8.33)
40–49	42 (3.37)
50–59	24 (1.92)
≥60	14 (1.12)
Occupation	
Independent student	244 (19.55)
Dependent student	870 (69.71)
Working	100 (8.01)
Retired	6 (0.48)
Other	28 (2.24)
Marital status	
Single	1042 (83.49)
Married	73 (5.85)
Common-law marriage	117 (9.38)
Separated	13 (1.04)
Divorced	3 (0.24)
Children	
No	1046 (83.81)
Yes	202 (16.19)

Source: own elaboration.

leads to a person's loss of interest in certain situations, people or things, in addition to a significant reduction in a person's ability to take pleasure in these.

Symptoms of depression may include a decrease in a person's 'feeling of liveliness', characterized by extreme physical fatigue. Similarly, symptoms such as inattention may appear, giving way to low concentration and decreased inhibitory control of irrelevant stimuli. Furthermore, depression may be accompanied by an inferiority complex associated with loss of confidence and a distorted perception of one's self-esteem as well as one's self-image,³² causing an

individual to experience a 'feeling of worthlessness'. Similarly, depression may involve feelings of guilt over events in the past or aspects of everyday life, as well as feelings of despair regarding the future, thoughts about death, ideas of suicide and even actions meant to inflict self-harm.

On the other hand, an anxious individual tends to focus his flow of thoughts on the future, developing intense worries about what will or could happen. Symptoms of anxiety include somatic and psychic issues, restlessness, syncope, vertigo, dizziness, hyper-reflexia, paresthesia, tremor, depersonalization, feelings of 'imminent death', feelings of 'loss of control', feelings of 'losing one's mind', derealization, hypervigilance, trouble concentrating, sleep disturbances, fatigue, rumination and anticipatory ideas. These may be accompanied by alterations in sleeping patterns and diets.

Strategies of support in case of depression and anxiety

According to the literature, moderate progress or improvement in adults' depressive states can be achieved by involving them in intervention projects focused on various aspects. These projects aim to establish strategies of support in the shape of psycho-educational programs, selective prevention programs, depression, anxiety and stress programs, neurofeedback programs, cognitive-restructuring programs, and relaxation programs.^{33 34}

Particularly, intervention processes based on psychosocial therapies, such as cognitive-behavioral therapy, have proven to be useful and effective for both psychiatric disorders³⁵ and some associated medical issues, such as certain cases of insomnia.^{36 37}

Depression and anxiety in adults

Other studies have investigated the prevalence of depression in adults, as well as its impact on their academic performance,¹ and their social and affective adjustment.^{2–4 38} Another object of study has been the academic environment—and the changes inherent to it—as a key factor in the development of depressive states among university students.^{2 39}

Other recent studies were focused on how changes resulting from protection measures against COVID-19 infection, such as quarantines, might be linked to the mental state of health-care staff located in environments with a high risk of exposure to the virus,^{40 41} as well as the mental state of other adults in general.^{9 11 12 25–27 29 42–44}

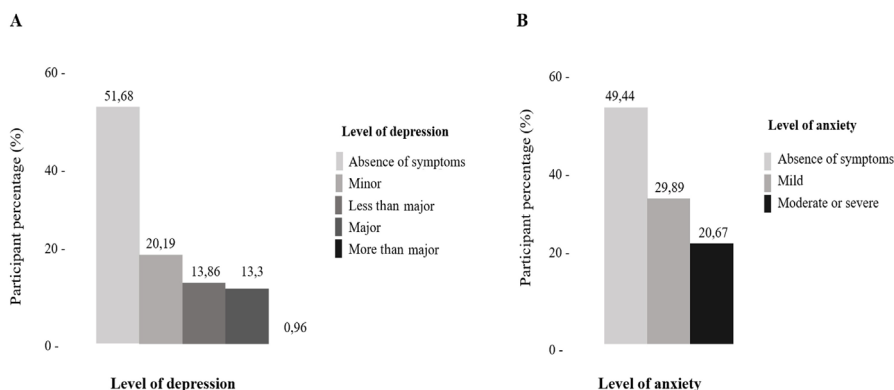


Figure 1 Distribution of subjects into categories of depression and anxiety. The bar graph shows (A) the frequency with which the subjects fell under the 'levels of depression' categories and (B) the frequency with which the subjects fell under the 'levels of anxiety' categories.

MATERIALS AND METHODS

Sample

Virtual scales were administered to adult subjects from some universities in Valle del Cauca, Colombia; most of them were students and the other adults were subjects from the region. Initially, a group of students filled the questionnaire, but they could invite people that they know and friends to fill the survey. The instrument was filled individually by all people in the sample. This is a descriptive, correlational, analytical and cross-sectional study aiming to assess the information provided by 1248 adults of both genders in the Valle del Cauca region of Colombia.

Tools

To fulfill our objectives, we used depression and anxiety scales in this study, which were filled in by adults on a single occasion, after providing informed consent. We employed the tools between May 26 and June 16, 2020, a time when the Colombian government required the population to remain isolated at home to reduce the risk of COVID-19 infection.

First, we researched various sociodemographic variables such as sex, age, occupation, marital status and whether the subjects had children or not.

Second, the *Hamilton Depression Rating Scale* (HDRS), which comprised 17 items on depressed moods, sleep disturbances and presence of suicidal thoughts, was administered. The questionnaire comprised multiple-choice questions, of which the answers correspond to numerical values ranging from 0 to 3. A value of 0 on this scale meant absence of symptoms, while a value of 3 was associated with frequent or highly present behavior in the individual who completed the scale. The total score on this scale was obtained by adding the scores from the 17 items, potentially ranging from 0 to 52 points, the maximum degree of depressive symptoms. Scores on the depression level are classified according to the scores obtained as follows: 0–7 points, no depressive symptoms evident; 8–13 points, minor depression; 14–18 points, moderate depression; 19–22 points, severe depression; 23 points or higher, more than major depression.^{45 46}

Lastly, the *Hamilton Anxiety Rating Scale* (HARS), composed of 14 items on physical, mental and behavioral components connected to the anxious mood, was administered. To assess the severity of symptoms, this scale has 5 options, where 0 represents absence of anxiety symptoms and 4 describes very severe symptomatology. We organized the answers as per numerical values ranging from 0 (absence of anxiety symptoms) to 56 points (maximum level of anxiety). Anxiety levels are interpreted according to the scores obtained: 0–5 points, no anxious symptoms evident; 6–14 points, mild anxiety; 15 points or higher, moderate/severe anxiety levels.⁴⁷

Statistical analysis of data

We performed a descriptive analysis of the sociodemographic variables to evaluate the distribution of the subjects as per sex, age, occupation, marital status and having children or not. Similarly, we performed a frequency analysis of certain items related to COVID-19 (being COVID-19-positive or having a close relative who was COVID-19-positive) or to the confinement measure. We obtained descriptive statistics from the scores on the anxiety (HARS) and depression (HDRS) scales, in addition

to obtaining the joint frequency distributions for these scales, in their categorical form and with certain variables of interest. We then adjusted a regression model for the binary response variable (depression and anxiety) using a logistical link to study its relationship with the demographic variables and confinement conditions. We performed the analyses using the free software R, assuming a value of 0.05 as the maximum type I error possible.

RESULTS

Distribution of subjects according to variables of interest

Table 1 shows how we distributed the subjects in the sample in accordance with sociodemographic variables such as sex, age, occupation, marital status and having children or not.

Most subjects were female (72.04%), of whom 68% were aged between 18 and 23. Moreover, 89.3% of the subjects were students, of whom 70% considered themselves as economically dependent. Furthermore, 83.6% of the subjects were single, while the rest were either in a common-law marriage (9.4%) or married (5.9%).

When asked if they had tested positive for COVID-19, by means of a formal diagnosis obtained from valid tests, only six subjects answered yes. Note that 58 people (4.65% of the sample reviewed) stated that a relative or someone close to them had tested positive for COVID-19.

Univariate analysis of subjects' results on HDRS and HARS

The scores obtained on the depression scale ranged from 0 to 37 points, and among these a mean of 8.4 points and a median of 7 points were reported, with the 75th percentile obtaining a score of 13. The depression scale scores were in turn divided into five categories: *no symptoms*, *minor*, *less than major*, *major* and *more than major*. **Figure 1** shows the distribution of subjects according to these categories.^{45 46}

We observed that only 1% of the subjects fell under more than major depression, while 13.3% fell under major depression, 13.9% under less than major depression and 20.2% under minor depression. What was interesting to us was that 50% of the subjects (48.3%) showcased some level of depression.

Regarding the anxiety scale, we obtained an average of 8 points and a median of 5—the distribution revealed a significant asymmetry—within a range of 0–42 points. Note that 25% of the subjects scored between 5 and 13, and in the 25th percentile the values for the anxiety test were higher than 13. We sorted the values obtained on the continuous scale into four categories: *absence of symptoms*, *mild anxiety*, *moderate anxiety* and *severe anxiety*. In approximately half of the subjects (49.4%)⁴⁷, the presence of anxious symptomatology was not evident in their answers, so they were classified as subjects with absence of symptoms. Furthermore, 29.9% presented symptoms of mild anxiety and 20.7% of moderate or severe anxiety, as shown in **figure 1**.

Bivariate analysis of subjects' results on the depression scales and the sociodemographic variables of interest

When studying the potential links between levels of depression and certain sociodemographic variables, we organized the information using a cross table, as shown in **table 2**.

We applied χ^2 test to determine any statistically significant differences that might suggest a link between

Table 2 Distribution of subjects according to level of depression and sociodemographic variables of interest

Depression level Total, N=1248						
Variable	Absence of symptoms	Minor	Less than major	Major/more than major	Total	P value
Sex						
Male	203 (58.17)	58 (16.62)	42 (12.03)	46 (13.18)	349	
Female	442 (49.17)	194 (21.58)	131 (14.57)	132 (14.68)	899	0.036*
Age (years)						
18–23	410 (48.29)	175 (20.61)	125 (14.72)	139 (16.37)	849	0.0448*
24–29	124 (57.67)	40 (18.6)	30 (13.95)	21 (9.77)	215	
30–39	63 (60.58)	19 (18.27)	9 (8.65)	13 (12.5)	104	
40–49	25 (59.52)	6 (14.29)	6 (14.29)	5 (11.9)	42	
50–59	14 (58.33)	8 (33.33)	2 (8.33)	0 (0)	24	
≥60	9 (64.29)	4 (28.57)	1 (7.14)	0 (0)	14	
Occupation						
Independent student	145 (59.43)	41 (16.8)	36 (14.75)	22 (9.02)	244	
Dependent student	418 (48.05)	185 (21.26)	122 (14.02)	145 (16.67)	870	0.0047*
Working	61 (61)	21 (21)	12 (12)	6 (6)	100	
Retired	6 (100)	0 (0)	0 (0)	0 (0)	6	
Other	15 (53.57)	5 (17.86)	3 (10.71)	5 (17.86)	28	
Children						
No	522 (49.9)	212 (20.27)	156 (14.91)	156 (14.91)	1046	0.0115*
Yes	123 (60.89)	40 (19.8)	17 (8.42)	22 (10.89)	202	

Source: own elaboration.

Values within parentheses are percentages with respect to the table row.

*P<0.05.

sociodemographic categories and depression (see [table 2](#)). We managed indeed to prove the existence of a link between depression and variables such as sex, age, occupation and having or not having children ($p<0.05$). Furthermore, we reported that there was a tendency toward depression during the lockdown among female subjects, subjects aged between 18 and 23, economically dependent subjects and subjects who did not have children. In our opinion, all of them were significant.

Bivariate analysis of subjects' results on the anxiety scales and the sociodemographic variables of interest

In order to assess the potential link between levels of anxiety and the sociodemographic variables, we organized the information using a cross table, as shown in [table 3](#).

Subsequently, we applied χ^2 test to reveal any statistically significant differences between sociodemographic categories and anxiety. We did not identify any such differences among any of the various genders, as proven in the bivariate analysis between sociodemographic variables and depression. However, we discovered a link between anxiety and variables such as age ($p=0.0095$), occupation ($p=0.0001$) and having or not having children ($p=0.015$). Thus, we established that women had a certain tendency, although not significant, toward anxiety during the lockdown. The link was valid for the subjects aged between 18 and 49, as well as for the economically dependent ones and those who had 'other' occupations. For subjects who did not have children, the differences were statistically significant, suggesting a certain connection to symptoms of anxiety, as demonstrated in [table 3](#).

Correlation between subjects' level of anxiety on HARS and level of depression on HDRS

In [figure 2](#) we show, after analyzing the variables quantitatively (scale scores), a correlation between anxiety and depression, resulting from the fact that the higher the subjects' anxiety scores (x-axis), the higher their depression scores (y-axis) as well. To determine the soundness of the correlation corroborated, we calculated the Spearman's rank correlation coefficient, of which the value was 0.7764, indicating a robust positive correlation between subjects' anxiety and depression.

Factors related to depression and anxiety

With the purpose of establishing which of the sociodemographic variables, which we linked to signs of anxiety and depression in the bivariate analysis, became risk factors for depression and anxiety among the subjects during the lockdown, we adjusted two logistic models with a binary (dichotomous) response variable.

For the model containing the 'presence of depressive signs' variable, we included the following covariates: sex, age, occupation and having children. Because the response variable had five levels (*absence of symptoms*, *minor*, *less than major*, *major* and *more than major*), we only split it into two levels (*no depression* and *depression*), keeping only the *absence of symptoms* category and simply grouping all levels of depression under *depression*. In [table 4](#) we show the results of the adjustment of this model through estimates of ORs, that is, each variable with its respective associated interval (with 95% confidence).

When it came to symptoms of depression, we reported that women were 1.426 times more likely to develop

Table 3 Distribution of subjects according to level of anxiety and sociodemographic variables of interest

Variable	Absence of symptoms	Mild	Moderate or severe	Total	P value
Anxiety level Total, N=1248					
Sex					
Male	186 (53.3)	101 (28.94)	62 (17.77)	349	
Female	431 (47.94)	272 (30.26)	196 (21.8)	899	
Age (years)					
18–23	385 (45.35)	271 (31.92)	193 (22.73)	849	0.0095*
24–29	122 (56.74)	62 (28.84)	31 (14.42)	215	
30–39	62 (59.62)	21 (20.19)	21 (20.19)	104	
40–49	23 (54.76)	10 (23.81)	9 (21.43)	42	
50–59	16 (66.67)	5 (20.83)	3 (12.5)	24	
≥60	9 (64.29)	4 (28.57)	1 (7.14)	14	
Occupation					
Independent student	142 (58.2)	60 (24.59)	42 (17.21)	244	
Dependent student	394 (45.29)	276 (31.72)	200 (22.99)	870	0.0001*
Working	59 (59)	32 (32)	9 (9)	100	
Retired	6 (100)	0 (0)	0 (0)	6	
Other	16 (57.14)	5 (17.86)	7 (25)	28	
Children					
No	501 (47.9)	329 (31.45)	216 (20.65)	1046	0.015*
Yes	116 (57.43)	44 (21.78)	42 (20.79)	202	

Source: own elaboration.

*P<0.05.

depression than men. Economically dependent students were 1.3589 times more likely to display symptoms of depression than economically independent students. We proved that the ‘age’ and ‘having children’ variables were factors of risk (former) and protection against depression (latter).

Moving on, to adjust the model containing the ‘presence of anxiety signs’ variable, we included the following explanatory variables: age, occupation, marital status and having

or not having children. Even when sex was not statistically significant, we included this variable in the model to assess whether the probabilities or risks were equal for both women and men. Because the response variable had three levels (*absence of symptoms, mild anxiety and moderate/severe anxiety*), we only split the response variable into two levels to dichotomize it (*no anxiety and anxiety*), and then simply grouped the *mild* and *moderate/severe* anxiety levels simply under *anxiety*. In table 4 we show the estimates of the ORs, that is, each variable accompanied by its respective associated interval (with 95% confidence).

According to our results, women could be 1.215 times more likely to develop anxiety than men. However, because the CI contained 1, this difference was not significant. On a different note, individuals aged between 24 and 29 were less likely to suffer from anxiety than those aged between 18 and 23 because their chances decreased by 0.734 times—a range that, despite not being significant at 5%, could become significant at 10%. Lastly, economically dependent students were 1.4795 times more likely to develop anxiety than economically independent students. In regard to both adjustment models, we identified that the ‘marital status’ variable did not represent neither a factor of risk nor one of protection for both anxiety and depression.

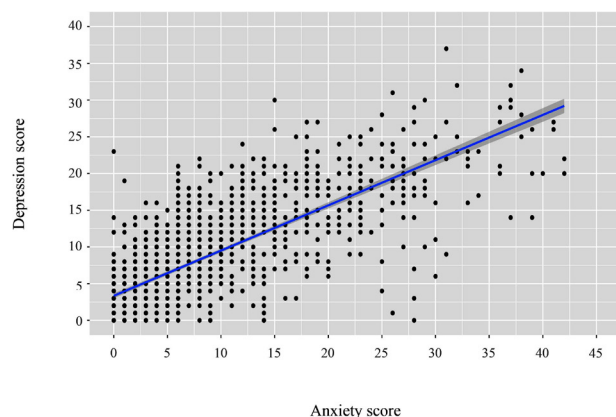


Figure 2 Scatter plot depicting anxiety and depression scores. The distribution of the point clouds in this scatter plot confirms the correlation between anxiety scores on the HARS (displayed on the x-axis) and depression scores on the HDRS (displayed on the y-axis), revealing that the higher the scores obtained by the subjects on the anxiety scale, the higher their scores on the depression scale, a fact that highlights a positive correlation between these variables. HARS, Hamilton Anxiety Rating Scale; HDRS, Hamilton Depression Rating Scale.

DISCUSSION

Our results indicated that women were more likely to show symptoms of depression and anxiety than men. This confirmed to be statistically significant only for depression, signaling a difference between genders. In the past, this tendency had already been reported among women in Mexico, Egypt and Korea, respectively, before the outbreak of COVID-19.^{15 48} It proved to be the case in Colombia.¹¹ Moreover, studies in China, Ireland and Turkey revealed

Table 4 Odds of the estimated coefficients and CI for depression and anxiety

Symptomatology	Variable	OR	Lower limit	Upper limit
Depression	Intercept	0.7116	0.4891	1.0317
	Female	1.4257	1.1069	1.8396
	24–29 years old	0.8193	0.5908	1.1346
	30–39 years old	0.9187	0.547	1.537
	40–49 years old	1.095	0.4779	2.4802
	>50 years old	1.0163	0.4336	2.3539
	Dependent student	1.3589	0.9836	1.8816
	Working	0.9762	0.549	1.7222
	Retired/other	0.8859	0.3949	1.9251
	Has children	0.7751	0.5308	1.1285
Anxiety	Intercept	0.8373	0.5744	1.2176
	Female	1.2154	0.9436	1.5663
	24–29 years old	0.7336	0.5289	1.0159
	30–39 years old	0.7996	0.4699	1.3545
	40–49 years old	1.1191	0.4796	2.6062
	>50 years old	0.6575	0.2697	1.5644
	Dependent student	1.4795	1.0675	2.0553
	Working	1.1367	0.6369	2.0208
	Retired/other	0.9031	0.3938	1.998
	Married	0.8099	0.4351	1.4887
	Common-law marriage	1.3508	0.8707	2.1056
	Separated/divorced	0.7315	0.2134	2.2183
	Has children	0.9086	0.6085	1.3562

Source: own elaboration.

that the COVID-19 pandemic caused more stress, anxiety and depression among women.^{10 49 50} Particularly in the case of China, anxiety disorder has occurred at three times higher levels for women during the COVID-19 pandemic.^{51 52}

In Asia there was a tendency for women to have higher levels of depressive and anxious symptomatology than men,⁵³ while in the UK no significant differences were found that would indicate more women had positive results for anxiety levels compared with men.⁵⁴

Other researchers state that, although women have a greater tendency to experience minimal and mild depressive symptomatology, men are mostly located in moderate to severe depressive stages; therefore, they affirm that compulsory social isolation has affected men more intensely.²⁹

Regarding age groups, it is evident that individuals between 18 and 23 years of age are more likely to present depressive and anxious symptomatology. Similar data were described in Colombia, showing that the highest levels of depression are concentrated between 16 and 35 years of age.²⁹ A similar age range (between 18 and 30 years) is found to be associated with a high risk of suicide from the same population.⁸ Contrary to these findings, for the present research, in the age range between 24 and 29 years, the possibility of presenting anxiety is particularly reduced. Similarly, in the USA there was evidence of increased anxiety and stress levels during the onset of the pandemic in young adults aged 22–29 years.⁵⁵

In Turkey, no significant differences were found between adults aged 18–49 years and over 50 years.⁵⁰ In contrast, in Ireland the highest values for anxiety were reported in individuals older than 65 years.⁴⁹ In the UK, in terms of age, very high levels of depressive and anxious symptomatology

were reported in younger individuals and lower levels in subjects older than 65 years.⁵⁴

Concerning the relationship between childhood and the presence of depressive and anxious symptomatology, in our study those individuals who do not have children showed a greater tendency to present depressive symptomatology. In seven Asian countries (China, Iran, Malaysia, Pakistan, Philippines, Thailand and Vietnam), the presence of children was associated with lower likelihood of having mental disorders during the COVID-19 pandemic.⁵³

On the other hand, in our study the variable associated with marital status did not emerge as a risk or protective factor for anxious and depressive symptomatology. These results differ from other studies that conclude that marital satisfaction is a protective factor against depression levels.²⁹

In regard to financial independence, our research revealed that economically dependent subjects, such as university students, were more likely to manifest symptoms of depression and anxiety than subjects who enjoyed a certain level of financial independence. Similar facts have recently been revealed regarding the population of China.¹⁰ In the UK, those whose financial income had decreased during the pandemic and those who reported low income were at significantly increased risk of anxiety and depression.⁵⁴

Finally, although our study does not reveal any information on the aspects that will be discussed below, these are assumed to be considerations to be taken into account due to their importance.

Concerning the categories of students, researchers and health professionals, a moderate level of anxiety is reported, while teachers and corporate employees reported only mild levels of stress.¹⁵ In India, it was found that for both

researchers and health professionals, depressive symptomatology was mild.⁵⁶ For students, it was described that they were moderately depressed, which may be due to changes in their daily life and teaching-learning activities.¹⁸

Extending those reported by cross-sectional studies, a longitudinal study was conducted in China in which the general population was surveyed on two occasions: during the initial outbreak and at the peak of the epidemic (4 weeks later), inquiring about sociodemographic aspects, symptoms, knowledge, concerns and precautionary measures for COVID-19. This study found that there was a reduction in mean scores related to the psychological impact associated with the pandemic situation after 4 weeks. During the baseline assessment, moderate to severe stress, anxiety and depression were observed in 8.1%, 28.8% and 16.5%, respectively, and there were no significant longitudinal changes in levels of stress, anxiety and depression.

Particularly, protective factors were found to include a high level of trust in physicians, perceived likelihood of survival and low risk of contracting COVID-19, along with satisfaction with available health information and personal precautionary measures.⁵⁷ These types of approaches are interesting because they allow us to track information on several variables across different points in time.

On the other hand, it is critical that the psychological impact of the COVID-19-associated outbreak on individuals and society, which is often the limiting factor in various nations overcoming the crisis, not be ignored. Certainly, the psychological dimension may be essential even after the epidemic is over, and the outbreak has highlighted the importance of mental resilience and the need to provide appropriate psychological intervention.³⁵ For current needs involving consideration of biosafety aspects, the employment of a platform (primarily used for learning processes) could provide a cost-effective tool to implement certain therapeutic procedures. Previous studies have highlighted how Moodle could be configured for use using certain coding languages.³⁶

In regard to the 'depression' variable, the scales enabled us to spot significant differences and reveal that women were more likely to develop depression than men and that childless subjects had a greater tendency toward depression. However, the 'marital status' variable did not turn out to be a factor neither of risk nor of protection against anxiety and depression.

We discovered that subjects aged between 18 and 23 were more likely to suffer from depression and anxiety and that economically dependent subjects were more prone to depression and anxiety than those who enjoyed a certain level of economic independence. We believe that this may be attributed to the 'freedom of social interactions' being restricted, an element that diminishes subjects' sense of control over their everyday lives.

As for economically dependent subjects aged between 18 and 23, we believe that the 'Personal Life Project', which focuses on strengthening people's skills to achieve economic independence, as well as devising concrete strategies to empower people to build *entrepreneurial and productive-individual* profiles, may represent a useful pedagogical and social alternative in the fight against depression in postpandemic times.

This study mainly used self-reported questionnaires to measure psychiatric symptoms and did not make clinical

diagnosis. The gold standard for establishing psychiatric diagnosis involved structured clinical interview and functional neuroimaging.⁵⁸⁻⁶⁰

Another limitation of this study is that, although it was possible to compare some of the results with findings obtained in countries such as India, Ireland, Turkey, England, Korea, Japan and China, among others, it would be of great relevance to know similar data in Latin American countries, for example, countries such as Brazil, Ecuador and Peru, and even Central American countries such as Mexico, Costa Rica and Panama, which share with Colombia general cultural aspects, but which at the level of their social conditions and their way of dealing with emotions perhaps present certain differences. In this sense, it would be important to know the data that relate the prevalence of depression and anxiety with having children and with level of financial autonomy in times of COVID-19 in order to contrast them with those presented in our study.

It is important to consider that administration of scales is usually carried out face to face; however, the current conditions led this procedure to be carried out online. The lack of face-to-face contact does not allow corroborating some aspects that would be confirmed through observation. Likewise, it is worth clarifying that this study aimed to compile data on the state of mental health, but no diagnosis of mental disorders was carried out.

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Contributors ÁAOG: responsible for the overall content as the guarantor. JFCG, LCPS: design, implementation and writing of the paper. JRTC, KSGC: design, data analysis and writing of the results. SAHI, ECG, DACS: project design and implementation. JSPL, MdCMR: data analysis and writing of the results.

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Competing interests None declared.

Patient consent for publication Not required.

Ethics approval This study is institutionally endorsed by the Universidad Santiago de Cali (Act 010-may 22-2020) and approved by the local ethics and bioethics committee of Universidad Santiago de Cali - 'CEB-USC' Health Faculty, Santiago de Cali, Valle del Cauca, Colombia. At the beginning of this study, we precisely explained to the subjects the purposes of the study and required their informed consent prior to asking them to fill in the scales. We informed the subjects that they could withdraw from the study at any time they might deem appropriate and without the requirement to provide any justification whatsoever. Informed consent was given in accordance with the Declaration of Helsinki and the participation of each subject was voluntary and anonymous.

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