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Do Coronavirus Confinement Measures Cause Anxiety, Stress and Depression in University Students?

Milka Elena Escalera-Chávez
Unidad Académica Multidisciplinaria Zona Media/ Universidad Autónoma de San Luis Potosí, MEXICO

Josefina C. Santana
Universidad Panamericana, Escuela de Comunicación, MEXICO

Arturo García-Santillán*
UCC Business School at Universidad Cristóbal Colón, MEXICO

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Abstract: Though Coronavirus disease (COVID-19) is not a disease that directly affects people's minds, the confinement measures intended to prevent its spread have been taking a toll on mental health. The objective of this study is to evaluate the level of anxiety, stress and depression in university students of the Middle Zone Multidisciplinary Academic Unit of the Autonomous University of San Luis Potosí during the confinement caused by the presence of COVID 19 and to evaluate if these levels are different in men and women. The sample consisted of 180 university students enrolled in the semester between January and May 2020. The short version of the 21-item DASS questionnaire was used. The results give evidence that the level of depression, anxiety and stress in these university students is not high and there is not enough evidence to say that there is a difference between the level of depression, anxiety and stress in women and men.

Keywords: *Anxiety, confinement, coronavirus, depression, stress.*

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Introduction

The coronavirus disease (COVID-19) outbreak was first reported in Wuhan, China on December 31, 2019, but it was not until March 11, 2020 that the Director General of the World Health Organization (WHO) announced that the new disease could cause a pandemic. That is, the disease could spread to several countries and affect a large number of people (Pan American Health Organization, 2020a, 2020b, 2020c).

In April, this Organization announced that the transmission of COVID-19 can be slowed or stopped by applying measures such as: 1) public health policies, 2) social distancing, 3) isolation of sick people and 4) quarantine. To establish preventive measures, Mexico took certain actions to avoid crowds by closing workplaces and educational institutions. People were advised to stay at home.

Among the recommendations made by the Ministry of Health in Mexico were: 1) Maintain lockdown until May 30, 2020; 2) ensure the adequate implementation of and compliance with health security measures; 3) regionalize the intensity of mitigation measures; 4) segment mobility in the national territory, and 5) after May 30, maintain the protection of groups with a higher risk of complications and death from the disease (Consejo de Salubridad General; 2020, Secretaría de Educación Pública [SEP] , 2020).

Based on the recommendations issued by the Ministry of Health, the National Association of Universities and Institutions of Higher Education (ANUIES) announced that the 6,404 higher education institutions in the association (2,455 public HEIs, 3,949 private HEIs) would contribute to the temporary suspension of activities of 5.3 million people, of which 4.7 million were students. Alcántara (2020) mentions that in order to continue with student education during this period, higher education institutions tried to adopt remote online learning, however, few were prepared with a solid structure to make the change (Concheiro, 2020). While these steps are necessary to reduce the spread of COVID-19, they can leave people feeling isolated, and lonely, and may increase stress, anxiety, and depression.

* **Corresponding author:**
Arturo García-Santillán, Universidad Cristóbal Colón, UCC Business School, Mexico. ✉ agarcias@ucc.mx

Cueto (2020) points out that even when COVID-19 does not directly affect the mind, the scenarios of change and uncertainty surrounding this disease may cause disorders such as anxiety, fear and stress. Onofre (2020, as cited in Cueto, 2020) expressed that in relation to "mental disorders or psychopathology pictures that are observed, there are two large groups that occur in times of pandemic: mood disorders and anxiety disorders" (np).

The Research Institute for the Development of Equity at Universidad Iberoamericana in Mexico City carried out an investigation during the early days of confinement and studied 833 people over 18 years of age. The results indicate that 37.4% of women are more likely to show states of anxiety than are men (27%), and that anxiety is the feeling that most afflicts people during quarantine (Navarro, 2020).

Teruel et al. (2020) conducted a study on the impact of COVID on the well-being of 800 Mexicans and reported that in the first days of phase 2, three out of ten Mexicans presented symptoms of anxiety, 29% of them had depressive symptoms and 32.4% of the population showed severe anxiety symptoms.

Regarding university students, little emphasis has been placed on possible anxiety, depression and stress caused by confinement. Thus, the psychological impact of the pandemic on this population is uncertain. Hence, the assumptions of this research are: during confinement, the level of anxiety, stress and depression in university students is high and there is a difference between the levels of anxiety, stress and depression in men and women.

To explain these assumptions, the objectives of this study are to evaluate the level of anxiety, stress and depression in university students during confinement by COVID 19, and to assess whether the levels of anxiety, stress and depression are different in men and women.

Literature review

It is considered essential to conceptualize anxiety, stress and depression. Sierra et al. (2003, p.49) state that "anxiety is remarkable when it is understood as an emotional reaction to a threat manifested at a cognitive, physiological, motor and emotional level". Stress, on the other hand, is a result of the individual's inability to face the demands of the environment. Finally, depression is a mood disorder characterized by a feeling of intense sadness lasting more than two months (Piqueras et al., 2008).

The World Health Organization reported that between 1990 and 2013, the number of people with depression or anxiety increased almost 50%, from 416 million to 615 million; about 10% of the world's population was affected (WHO, 2016). In Mexico, the National Autonomous University of Mexico (UNAM) reported in June 2019 that out of every 100 inhabitants, 15 suffer from depression. They also point out that this figure could be higher; some people have never been diagnosed, and others may live up to 15 years with this condition without knowing that they suffer from it. Among sufferers is a high number of young people between 12 and 22 years old characterized by being irritable and violent. Regarding gender, they point out that for every man with depression, two women suffer from it. This difference is due to the fact that most men do not recognize depression as a disease, but when they seek help, their depressive symptoms are severe (Dirección General de Comunicación Social, 2019).

Studies by Arrieta et al. (2014) on depression and anxiety in university students reveal a high prevalence of these symptoms. Later, Tijerina et al. (2019) studied depression, anxiety, and stress in students new to higher education and showed that 19.9% have some degree of anxiety, 36.9% some degree of depression and 19.8% show stress. Halgravez et al. (2016) reported that the perception of stress in Mexican students was 60.7%, and the highest percentage corresponds to women.

In recent years Barrera-Herrera et al. (2019) have focused their research on university students, because studies show that mental health disorders or symptoms may be triggered by students' trying to meet family expectations and because university studies demand greater responsibility (Arnett, et al., 2014; Baader et al., 2014; Micin & Bagladi, 2011).

Okumusoglu (2018) studied eating disorders and depression in international students in Cyprus. She reports that 14.81 % of university students from Africa and Asia show a score over the pathological cut off point on the CESD-R depression scale. The study also found a correlation between eating disorders and depression in the studied population, and the link was more evident in women respondents than in men.

Brooks et al. (2020) state that during epidemiological crises, mental health problems increase due to isolation measures, mobility restriction and decrease in direct physical contact. They emphasize that the symptoms of severe depression and related symptoms with post-traumatic stress can manifest up to three years later. For its part, the WHO has explained that when this type of crisis occurs, up to a fifth of the affected population may suffer a mental disorder (WHO, 2016).

During the coronavirus pandemic, China reported a 23.04% anxiety rate in health personnel, and it was higher in women than in men, and among nurses more than among doctors. In relation to the general population, 53.8% of the population had a moderate to severe psychological impact. Within this percentage, 16.5% showed depressive symptoms, 28.8% anxiety symptoms, and 8.1% stress symptoms; the sector of the population that was most affected

was female students (Lozano-Vargas, 2020). Cao et al. (2020) found mild to severe stress in 25% of the students they studied, also in China.

Once the virus appeared in Spain, Ozamiz-Etxebarria et al. (2020) studied the levels of stress, anxiety and depression and the levels of psychological symptoms according to age, chronicity and confinement in students of the Basque Autonomous Community. The results show that stress, anxiety and depression were higher among the population between 18 and 25 years old. The authors consider that the main cause of this was the change that occurred in the teaching-learning process, which went from face-to-face to online classes.

An Italian study by Marelli et al. (2020) found symptoms of depression in 27.8% of their respondents, and signs of anxiety in over 34%. Their study included university staff as well as students, but depression and anxiety were greater in students than in staff, especially in females.

Vallejo (2020, as cited in Fernández, 2020) in his preliminary studies on the psychosocial impact of COVID-19 on students, reported that "one in three participants presents a generalized anxiety disorder, exceeding a score of 10 in the Generalized Anxiety Disorder (GAD) test, according to normative criteria validated for Spain. On the other hand, one in five also requires professional intervention for depression, according to the Patient Health Questionnaire PHQ-9, exceeding a score of 14. Sleep patterns are also severely altered in one in three young people, according to scores of the Abbreviated Injury Scale (AIS)" (p.1). In this sense, Brooks, et al. (2020) observe that, as the quarantine continues, fears intensify, which can cause lasting negative effects.

Finally, a another study carried out in Mexico (González-Ramírez, et al., 2020), used the Impact of Event Scale-Revised (IES-R) to measure the impact of the pandemic and social distancing measures on students and staff at a local university. The authors found evidence of some form of psychological distress in a quarter of their respondents. Distress was more common in women and younger respondents, and in persons who were employed, and/or unmarried.

Attempting to expand on these previous studies, we sought to answer the following research questions: What is the level of anxiety, stress and depression in college students during the coronavirus lockdown? Is there a difference in the level of anxiety, stress and depression in men and women?

Methodology

Research goal

The objectives of this study are to evaluate the level of anxiety, stress and depression in university students during confinement due to COVID 19. Additionally, it seeks to explore whether the levels of anxiety, stress and depression differ in male and female students.

Sample and data collection

This research is quantitative and cross-sectional. The total population of university students in Mexico in 2020 was 4, 061,644, of which 1 999 078 are men and 2 062566 are women. In the state of San Luis Potosí (SLP) there are 79, 563 university students, of which 38,243 are men and 41,320 are women (Instituto Nacional de Geografía y Estadística [INEGI], 2020). In the municipality of Rioverde SLP, the population of the Middle Zone Multidisciplinary Academic Unit of the Autonomous University is 1200 students.

The sampling was non-probabilistic, since those accessible cases that agreed to be included were selected. The sample was based on the convenience, accessibility, and proximity of the subjects to the researcher. The questionnaire was applied using the QuestionPro platform. The link was sent to a professor from each department and each semester. They were asked to share it with their students; it was seen by 464 students who had been attending in-person classes in the schools of Administration and Public Accounting and that due to the pandemic, had had to migrate to remote, online classes. Of the 464 students who saw the questionnaire, only 180 completed it. The sample consisted of 64.0% women and 36 %, men; 36% of the female students were between 20 and 23 years old. Of the men, 19% were between 20 and 23 years old (table 1).

Table 1.Demographic data

Age	Women	Men
16-19	24.00%	14.00%
20-23	36.00%	19.00%
24-27	3.00%	2.00%
28+	1.00%	1.00%
Total	64.00%	36.00%

Instrument

The short version of the Depression Anxiety Stress Scale (DASS) with 21 items was used. The essential function of the DASS is to assess quantitatively the severity of the core symptoms of depression, anxiety and stress. The instrument was developed by Lovibond and Lovibond (1995); it is in the public domain and is meant to be self-reported. It has been widely used throughout the world to measure stress, anxiety and depression in different contexts. DASS-21 has good-to-excellent internal consistency, very good convergent validity, and acceptable discriminative validity, and the Spanish language version is comparable to the original in terms of validity and consistency (Arrieta, et al, 2013). The internal consistency reliability for the DASS-21 total score was 0.94. The scale reliabilities for depression, anxiety and stress are Cronbach's alpha 0.91, 0.84, and 0.90 respectively.

The questionnaire asks respondents to answer regarding their feelings during the previous week. Each item is rated on a scale on 4-point Likert scale scoring from 0-3 (0: Did not apply to me at all -1: Applied to me to some degree, or some of the time; 2: Applied to me to a considerable degree, or a good part of time -; 3: Applied to me very much, or most of the time -). Scores from each construct were categorized as “normal”, “mild”, “moderate”, “severe” and “extremely severe” (normal = 1, mild=2, moderate = 3 , severe = 4, and extremely severe =5). The higher the severity of the manifestation in each construct, the higher the score.

Table 2. DASS severity classifications

Severity	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26- 33
Extremely Severe	28+	20+	34+

Source: taken from Lovibond and Lovibond (1995) and Arrieta et al. (2013)

The questionnaire, in addition to evaluating the presence or absence of depression, anxiety and stress, alerts to a high level of anguish in the student. The questionnaire was applied online because there was no face-to-face activity at the university due to the pandemic. A pilot study was conducted prior to data collection. No significant problems were identified, and minor modifications were made to clarify the survey instructions.

Data Analysis

Statistical analyses were performed with SPSS version 25.0 software. The score was determined from the scores of the items of each construct. The reliability analysis was applied to each construct: depression (.889), anxiety (.886) and stress (.878), all three show a value greater than 0.92, which is the minimum acceptable value (Bojórquez et al., 2013).

The percentage of the level of depression in the sample is determined. According to the DASS severity classification, a score of 21 is considered a level of severe depression. From these data, the first assumption of the investigation is established.

The percentage of the anxiety level of the sample is also determined. According to the DASS severity classification, a score of 15 is considered a severe anxiety level. From these data comes the second assumption of the investigation.

Finally, the percentage of the stress level of the sample is determined. According to the DASS severity classification, a score of 26 is considered a severe stress level. From these data, the third assumption of the investigation is established.

Ethical considerations

Student participation in this research was voluntary. The students were previously notified of the purposes of the study and they agreed to participate. None of the researchers has direct contact with the participants in a teacher-student role, nor in any other capacity. Data were collected anonymously. Though Mexican law requires all research on human subjects to be validated by an ethics committee (Comisión de Bioética, 2018), official resolutions are not usually issued in cases of no-risk or minimal risk studies (Miranda-Novales & Villasís-Keever, 2019). The proposal for the study was presented to a committee of researchers from the institution where the research took place. They reviewed the protocol and approved it, issuing a letter to that effect before the study took place.

Results

Table 3 shows the mean and standard deviation of each of the dimensions of the DASS-21 questionnaire.

Table 3. Mean and standard deviation of the dimensions

Variable	Mean	±SD	N
Depression	9.3	8.908	180
Anxiety	7.28	7.642	180
Stress	12.02	9.169	180

These first data give an overview of the level of depression, anxiety and stress that students present. It can be observed that stress is the dimension with the highest score.

Regarding the assumption: the level of depression in university students is high, the null hypothesis is established considering that values equal to or greater than 10 are high. The statistical representation of the hypothesis is as follows:

Ho: $\mu \geq 21$

Ha: $\mu < 21$

To test the hypotheses, first, the level of depression of the students was determined. Table 4 shows that the percentage of students who have a severe or extremely severe level of depression is 10.6%., It was also determined whether the students' level of depression is associated with gender. The results show an association between the variables since the chi square value is 2.986 and the p value is .024.

A one-sample chi-square test was applied to check the percentage of students and judge whether the sample is a good fit for the particular population. The results indicate that the available sample does not fit the data one would expect to find in the population. The chi square value is 161.111 (19gl) and the p value is p <0.00010

Table 4.Depression level

Classification	Range	%
Normal	0-9	60.6
Mild	10-13	10.0
Moderate	14-20	18.9
Severe	21-27	3.9
Extremely severe	28+	6.7

The statistic test was applied to the data *t*- at a significance level of 0.05. The value of t (-17.622) is greater than 1.96, therefore the null hypothesis is rejected. It is corroborated with the p value (p <0.0001), as this value is smaller than the established significance value (0.05). Therefore, the alternative hypothesis is accepted; that is, the students do not have high levels of depression.

Regarding the assumption: the Anxiety level in university students is high, the null hypothesis is established considering that values equal to or greater than 15 are high. The statistical representation of the hypothesis is the following:

Ho: $\mu \geq 15$

Ha: $\mu < 15$

To test the hypotheses, the anxiety level of the students was obtained. Table 5 shows that 17.3% of the students have a severe or extremely severe anxiety level. A one-sample chi-square test was applied to check the percentage of students and judge whether the sample is a good fit for the particular population. The results indicate that the available sample does not fit the data one would expect to find in the population. The chi square value is 176.444 (19gl) and the p value is p <0.0001.

Table 5. Anxiety level

Classification	Range	%
Normal	0-7	63.3
Mild	8-9	7.2
Moderate	10-14	12.2
Severe	15-19	6.7
Extremely Severe	20+	10.6

The statistic t- test was applied to the data at a significance level of 0.05. It is observed that the value of t (-13.557) is greater than 1.96, therefore the null hypothesis is rejected. It is corroborated with the p-value <0.0001; as this value is smaller than the established significance value (0.05). Therefore, the alternative hypothesis is accepted; that is, the students do not present high levels of anxiety.

Regarding the assumption: The Stress level in university students is high, the null hypothesis is established considering that values equal to or greater than 26 are high. The statistical representation of the hypothesis is as follows:

Ho: $\mu \geq 26$

Ha: $\mu < 26$

To test the hypotheses, the anxiety level of the students was obtained. Table 6 shows the percentage of students who have a severe or extremely severe anxiety level and it is 11.1%.

A one-sample chi-square test was applied to check the percentage of students and judge whether the sample is a good fit for the particular population. The results indicate that the available sample does not fit the data one would expect to find in the population. The chi square value is 80.667 (19gl) and the p value is p <0.0001

Table 6. Level of stress

Classification	Range	%
Normal	0-14	66.7
Mild	15-18	12.8
Moderate	19-25	9.4
Severe	26-33	9.4
Extremely Severe	34+	1.7

As with the previous dimensions, the test statistic was applied to the data at a significance level of 0.05. It is observed that the value of t (14.665) is greater than 1.96; therefore, the null hypothesis is rejected. It is corroborated with the value of p <0.0001; as this value is smaller than the established significance value (0.05). Therefore, the alternative hypothesis is accepted; that is, the students do not present high levels of stress.

Regarding the assumption: the levels of anxiety, stress and depression are different in men and women. The statistical hypothesis is represented as follows:

$$Ho: Med_1 = Med_2$$

$$H_0 Med_1 \neq Med_2$$

The Mann-Whitney U statistic was used at a level of significance (0.05); results are shown in Table 7.

Table 7. Difference between men and women

	Depression	Anxiety	Stress
U de Mann-Whitney	3223.000	3377.000	3405.000
Z	-1.469	-1.012	-.920
Sig. asymptotic(bilateral)	.142	.312	.357

As can be seen, the value of p values of the Mann-Whitney U test was .142 for depression, .312 for anxiety and .357 for stress, so the null hypothesis is not rejected and it is concluded that levels of depression, anxiety and stress do not differ between men and women.

Discussion

From the estimates obtained, one of the objectives proposed in this study was achieved. This consisted of evaluating whether the level of depression, anxiety and stress in university students is high. The results reveal that, in these students, severe or extremely severe levels of depression are not significant. The results are in line with those of Brooks et al. (2020), who found that university students were less likely to suffer distress from quarantine than working adults.

Ozamiz-Etxebarria et al. (2020) conducted a survey when the pandemic was just beginning and the population still did not understand its significance. Their results showed that, among the general population, there were no strong levels of anxiety, depression and stress. However, they indicate that this could have changed when people realized the social and economic impact of the pandemic. In addition, the authors admit that the levels of anxiety, stress and depression could have increased during the confinement. The authors also found significant levels of stress, anxiety and depression in the Spanish population between 18-25 years. They attribute this high level of stress to the fact that the respondents were students.

This present study was carried out in Mexico when the confinement had already been decreed and the students had begun taking their courses online. Despite being in a confinement situation, the students did not present high levels of anxiety, depression or stress, even though this study was carried out two months after the investigation carried out by Ozamiz-Etxebarria et al. (2020).

The findings in this present study diverge from the evidence obtained by Lozano-Vargas (2020) who showed that in China the general population had a moderate to severe impact due to coronavirus epidemic. One of the most affected populations were people aged 18-30 years and one of the factors associated with a high psychological impact was their student status. Cao et al. (2020) found similar results. Another study (Marelli et al., 2020) found strong evidence of anxiety, stress, and sleep disruption among university students in Italy.

Thus, our findings differ from most of the other studies mentioned above. Though research carried out in China, Spain, and Italy are showing high degrees of anxiety, stress, and depression among university students, this is not the case with Mexican students. A possible explanation is that the Mexican students do not present high levels of anxiety, depression and stress because the different media had been reporting on what other countries had experienced and the measures that were being taken.

It is also important to point out that lockdown measures meant that most students remained at home and had their classes online. Thus, they did not have to deal with the additional stress of living on their own and they may have found emotional support in their families.

Conclusions

The study explored anxiety, depression or stress among Mexican university students during the lockdown implemented due to the coronavirus pandemic. Participants' responses on the Depression Anxiety Stress Scale showed little evidence of these. Thus, our findings contrast with other studies in similar populations.

Possible reasons for the difference in findings may be that the virus arrived later to Mexico than to China or Europe. Those regions had already taken lockdown precautions when the first cases were declared in this country. Thus, our student population knew what was coming and was mentally prepared to face it. Additionally, having to take online classes from home, surrounded by the family, rather than having to deal with living alone, may provide an additional level of emotional support.

Importantly, though the respondents show little stress, anxiety, and depression, as compared to populations in other studies, it cannot be said that they are completely stress-free. These feelings need to be acknowledged and addressed by educational authorities.

Recommendations

The information obtained is a good frame of reference for subsequent research in which it would be convenient to carry out this study again under the new conditions that the country is currently living. Lockdown continues and all educational activities have moved online. Respondents could have been mentally prepared for a short confinement, and it would be valuable to understand if the continuing lockdown, as well as the increased number of coronavirus cases in the country, has taken a toll on their mental health.

In any case, educational institutions must provide emotional and psychological support to the students through specialized persons or departments. Teachers, as the first contact with students, should be attentive to their needs and recommend the students take advantage of these specialists.

Additionally, it would be useful to qualitatively capture the experiences and perspectives of college students taking online classes, to understand their experience of anxiety, stress, or even depression. Similarly, additional research could explore the experiences of students who do not have access to the internet or whose access is minimal.

Limitations

A limitation of this study is that only the students of the Middle Zone Multidisciplinary Academic Unit of the Autonomous University of San Luis Potosí were invited to participate. The students of the different programs taught by the University, and those taught in the different campuses, or in different regions of the country, were not considered. The Middle Zone is located in a small urban area, with a population of around 50 thousand people.

Another limitation of the study is the fact that data collection was carried out in the early stages of the pandemic and lockdown. A year into the crisis, it would be worthwhile to replicate the study to explore how the current mental state of Mexican students.

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