# Related factors of depressive symptoms vary among adolescents and young adults during the COVID-19 pandemic

*Los factores relacionados con los síntomas depresivos varían entre los adolescentes y los adultos jóvenes durante la pandemia de COVID-19*

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**Abstract**

Depression represents a public health problem, especially in the adolescent and young adult populations. Studies have shown that during the COVID-19 outbreak, depressive symptoms were associated with economic instability, among other aspects related to isolation. The present study seeks to identify sociodemographic characteristics and situations associated with the presence of depressive symptoms in young people (N = 2058) in an Andean city at the beginning of the COVID-19 outbreak. Logistic regression analysis reveals that the factors predicting depressive symptoms vary between adolescents and young adults. The results show that perceived health status, satisfaction with virtuality, and being a woman are related to depressive symptoms. Likewise, it was found that, in young adults, but not in adolescents, the level of economic income and taking virtual classes were related to symptomatology. Receiving economic income turned out to have a differentiated effect according to age group since this factor increases the probability of developing depressive symptomatology in adolescents, while it reduces this probability in the older age group. Finally, the findings of this study are discussed by evidence from other studies in different countries.

**Keywords:** Depressive symptoms; Mental health; Living conditions; Isolation; Youth.

**Resumen**

La depresión representa un problema de salud pública, especialmente en la población adolescente y adulta joven. Los estudios han demostrado que durante el brote de COVID-19, los síntomas depresivos se asociaron con la inestabilidad económica, entre otros aspectos relacionados con el aislamiento. El presente estudio busca identificar las características sociodemográficas y las situaciones asociadas a la presencia de síntomas depresivos en jóvenes (N = 2058) en una ciudad andina al inicio del brote de COVID-19. El análisis de regresión logística revela que los factores que predicen los síntomas depresivos varían entre adolescentes y adultos jóvenes. Los resultados muestran que el estado de salud percibido, la satisfacción con la virtualidad y el hecho de ser mujer se relacionan con los síntomas depresivos. Asimismo, se encontró que, en los adultos jóvenes, pero no en los adolescentes, el nivel de ingresos económicos y la toma de clases virtuales se relacionaron con la sintomatología. Recibir ingresos económicos resultó tener un efecto diferenciado según el grupo de edad, ya que este factor aumenta la probabilidad de desarrollar sintomatología depresiva en los adolescentes, mientras que reduce esta probabilidad en el grupo de mayor edad. Finalmente, los hallazgos de este estudio son discutidos por la evidencia de otros estudios en diferentes países.

Palabras clave: síntomas depresivos, salud mental, condiciones de vida, aislamiento, juventud.

**Introduction**

Currently, depression represents a public health problem due to its high prevalence worldwide. More people are diagnosed with depression yearly, especially in the adolescent and young adult populations. It has been estimated that depression can interfere in the life of approximately 450 million people and generate a long-term affectation on the social sphere (WHO, 2021). In the Latin American and Caribbean context, it has been found that 5% of the adult population suffers from depression, and between 60% and 65% of them do not receive care (Médecins Sans Frontières, 2021). The main characteristic of depression is a mood of lack of interest, anhedonia, or lack of pleasure (Griffiths et al., 2014; Trimmer et al., 2015; Rosenström & Jokela 2017).

This problem was increased during the COVID-19 pandemic due to different countries opted for isolation as a preventive measure (Bareeqa et al., 2021; Hyland et al., 2020). Depressive symptoms and mental health problems were associated with the constant fear of being infected; job reductions; decreased family income (De Miquel et al., 2022; Ettman et al., 2021; Griffiths et al., 2021; Hyland et al., 2020); as well as, the challenge of adapting to the generalization of online work (De Sio et al., 2021; Mendonça et al., 2022) and online education (Lovon & Cisneros, 2020; Ma et al., 2021); and significantly reduced possibilities for social contact (Killgore et al., 2020).

Beyond the conditions generated by COVID-19, the development of depressive symptoms has been related to factors that facilitate their onset; within these factors research has found that gender has been associated with depressive symptoms (Maser, et al., 2019; Stallman, 2010; Usher, & Curran, 2019). These differences have been explained by physiological factors and mechanisms distinctive to both genders (Howard, et al., 2017; Albert, 2015), and by cultural differences concerning gender (Ren, et al., 2020; Liu, et al., 2021). Likewise, younger people have been found to report higher levels of anxiety and depression compared to older adults (Stallman, 2010; Usher, & Curran, 2019). One explanation given for these differences has been the sociocultural conditions associated with each stage of the life cycle (Thapa, et al., 2020).

Another trigger for depressive symptoms has been chronic health conditions and disabilities in daily life, not only for the sufferer but also to close family members (Thapa, et al., 2020; He, et al., 2019). Similarly, depressive symptoms have been linked to perceived poor health and smoking (Thapa, et al., 2020). In addition, socioeconomic, and situational factors are shown to be related to depression. It has been found that in the Colombian young population, belonging to a low socioeconomic level, increases the probability of presenting depressive symptoms (Ferrel et al., 2011). Similarly, job instability, isolation, and being divorced, make up a set of situations that can lead to suffering from the disorder (Díaz, et al., 2006; Loades et al., 2020; Chang et al., 2017).

In the context of COVID-19, the research found that during the outbreak young adults, women, people with higher educational levels, and people with high consumption of different social networks presented higher odds of having psychological stress, depression, anxiety, or sense of frustration (Bendau et al., 2021; Griffiths et al., 2021; Mendonça et al., 2022; Guo et al., 2020; Hyland et al., 2020; Thibaut & Van Wijngaarden-Cremers, 2020; Varma et al., 2021). Likewise, predictors of depression during the pandemic varied according to age ranges. In people aged 18-35 years, perceived general stress, worry about finances, sleep difficulties, and sedentary lifestyle predicted higher levels of depression, whereas in adults older than 55 years a higher number of dependents and poorer adjustment to the outbreak were predictors of depression in addition to those mentioned for the other younger group (Varma et al., 2021). Mainly, the objective of this study is to identify sociodemographic characteristics and situations associated with depression in young people in a city in the Colombian Andean Region during the COVID-19 outbreak. Considering the aforementioned scenario, it is expected that females present higher levels of depression than males. Likewise, it is expected that socioeconomic conditions and situational stressors are associated with a high risk of presenting depression in adolescents and young adults.

## Method

### Procedure and sample

A secondary database was used for this study, which was published by the Alcaldía de Medellin, Colombia, in December 2020. According to this organization, the data were collected through a survey from March 2020 to April 2020, a period that corresponds to the beginning of the mandatory outbreak of COVID-19 in Colombia. The sample consisted of 2058 young people from the city of Medellin, $M_{age}$ = 21.32, SD = 4.08, aged between 14 and 28 years. There was higher participation of women (64.45%), single people (89.13%), and people who had completed their high school studies (61.44%), followed by those who had undergraduate studies (22.53%). A total of 81.28% of the participants indicated that their monthly household income did not exceed two minimum salaries, which at that time was equivalent to approximately 452 USD.

### Measures

#### Depressive symptoms

Depressive symptoms were measured by nine questions asking about different symptoms associated with the disorder based on DSM-5 diagnostic criteria (e.g., "How many days in the last week have you had little interest or pleasure in doing things?", "How many days in the last week have you thought you would be better off dead or hurting yourself?"). Participants responded on a numerical scale from 0 to 7 days a week. The responses to each of the questions were subjected to a principal components analysis to determine the number of components underlying those items and the reliability of the item was established, $\alpha$ = .90.

#### Sociodemographic and situational characteristics

Data collection included sociodemographic variables such as age, gender, marital status, level

of education obtained and socioeconomic level. Information was also registered on whether the participants were victims of domestic violence, were financially responsible or cared for someone, had access to the Internet, had interrupted the educational process, had some type of physical disability, as well as their perception of individual health and satisfaction with the virtual classes. All these variables were reported in a categorical manner.

### Data analysis

The normality of the depressive symptom scores was evaluated but did not show normal behavior as well as the exponential and logarithmic transformations of the same. Because of this, group comparisons by gender and age group were made using non-parametric statistical techniques. A binomial logistic regression analysis was then performed. The logistic regression analysis was used to predict the probability of presenting higher scores on the scale, so we proceeded to dichotomize the scores obtained by the participants. The third quartile was used as a cut-off point to differentiate the group with the highest presence of depressive symptoms from the rest of the participants. In this analysis, the socioeconomic level was dichotomized into "Low" vs. "Medium and High" since no statistical differences were found in the scale between the last two socioeconomic levels.

### Results

Descriptive analyses of the items assessing the frequency with which the young people present symptoms of depression showed that the most frequent symptoms were alteration of the sleep cycle, Me = 2, RIQ = 2, and alteration of appetite, Me = 2, RIQ = 3, followed by low motivation towards daily activities, Me = 1, RIQ = 3, low mood, Me = 1, RIQ = 3, feeling tired, Me = 1, RIQ = 3, feeling of failure in front of oneself or family, Me = 1, RIQ = 2, and concentration problems, Me = 1, RIQ = 3. The least frequently recorded symptoms were ideation of death or self-harm, Me = 0, RIQ = 0, and impaired movement or language fluency, Me = 0, RIQ = 2. Normality analysis showed that symptoms of depression scores do not have a normal distribution (W = .86864, $p < .001$). Also, it was found that young adults, Me = 47.77, RIQ = 11.50, score higher than adolescents, Me = 45.71, RIQ = 10.46, W = 383377, $p < .001$.

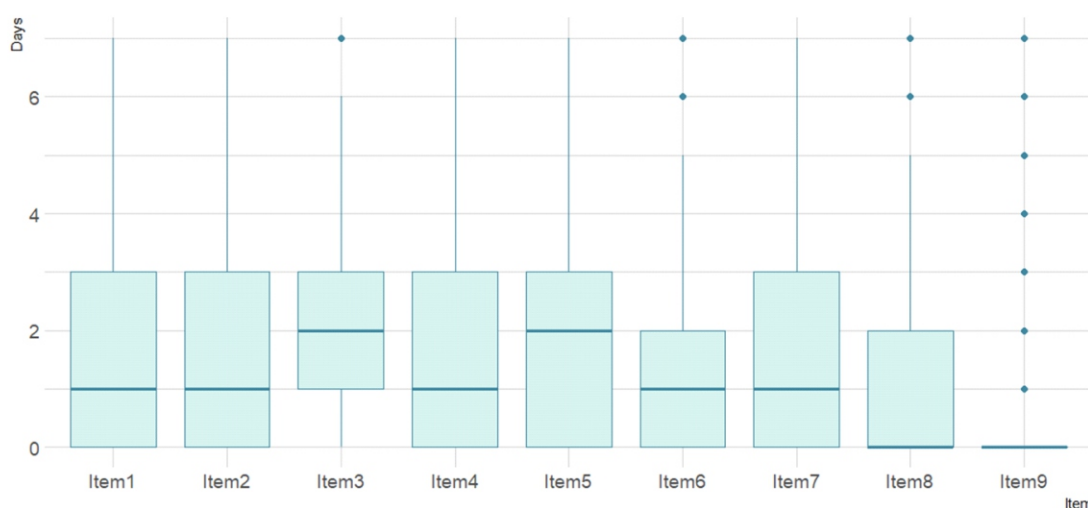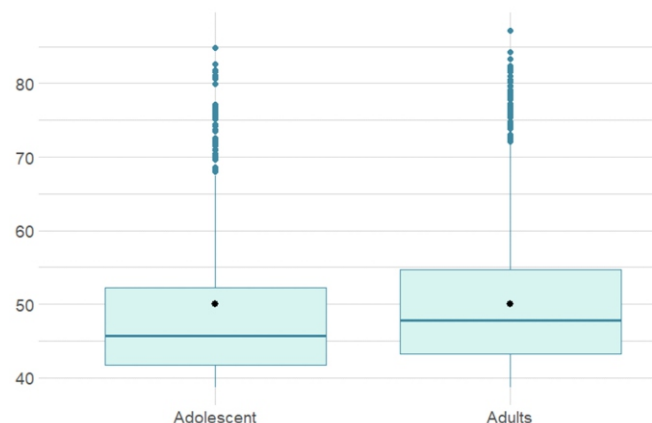Figure 1. Symptoms in the last week

Figure 2. Depression scores according to age group and gender



## Predictors of high levels of depression in adolescents

Logistic regression analysis determined that being female, OR = 1.64, SE = .24, *p* = .041 and having economic income, OR = 3.63, SE = .60, *p* = .031, are factors associated with the high presence of depressive symptoms in adolescents, while perceiving a good state of health, OR = .33, SE = .25, *p* < .001 and feeling satisfied with virtual classes, OR = .47, SE = .37, *p* = .042, were factors associated with low scores on the scale. On the other hand, having low socioeconomic level, having persons dependents, being a victim of violence, continuing the educational process, having access to the Internet, and having some types of disability were not related to high levels of depressive symptoms in the adolescents in the sample, *ps* > .05.

## Predictors of high levels of depression in emerging adults

When establishing predictors of depressive symptoms in emerging adults, it was found that being female, OR = 2.02, SE = .18, *p* = .001 and continuing the educational process, OR = 3.22, SE = .32, *p* < .001, were related to a higher probability of presenting high scores. Meanwhile, having a low socioeconomic level, OR = .61, SE = .17 *p* = .004, receiving income, OR = .62, SE = .20 *p* = .019, presenting a favorable health status, OR = .36, SE = .18, *p* < .001, and feeling satisfied with the virtual educational training, OR = .47, SE = .32, *p* = .017, were associated with lower probability of presenting high symptoms. However, no evidence was found to support any type of association between high scores and having dependents, having access to the Internet, and having some type of disability and being a victim of violence *ps* > .05.

Table 1. Predictors of depressive symptoms in adolescents and young adults

| | Adolescents | | | | | Young adults | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | OR | , | SE | Wald | P-value | OR | β | SE | Wald | P-value |
| (Intercept) | **.37** | -.98 | .50 | -1.99 | .047 | **.25** | -1.40 | .40 | -3.46 | .001 |
| Low income | .79 | -.24 | .24 | -1.00 | .319 | **.61** | -.50 | .17 | -2.91 | .004 |
| No dependents | 1.05 | .05 | .29 | .17 | .863 | 1.20 | .18 | .17 | 1.05 | .293 |
| Victim of violence | 2.35 | .85 | .72 | 1.19 | .232 | 3.07 | 1.12 | .58 | 1.95 | .051 |
| Receives income | **3.63** | 1.29 | .60 | 2.16 | .031 | **.62** | -.48 | .20 | -2.35 | .019 |
| Favorable health status | **.33** | -1.11 | .25 | -4.44 | <.001 | **.36** | -1.03 | .18 | -5.88 | <.001 |
| Attendance to virtual classes | 1.21 | .19 | .22 | .84 | .402 | **3.22** | 1.17 | .32 | 3.64 | <.001 |
| Internet access | 1.49 | .40 | .28 | 1.41 | .159 | 1.09 | .09 | .20 | .45 | .655 |
| Satisfied with virtuality | **.47** | -.76 | .37 | -2.03 | .042 | **.47** | -.76 | .32 | -2.39 | .017 |
| Disabled | .57 | -.56 | 1.15 | -.49 | .625 | 1.11 | .10 | .56 | .18 | .858 |
| Woman | **1.64** | .49 | .24 | 2.05 | .041 | **2.02** | .70 | .18 | 3.86 | .001 |

**Discussion**

In this study, we aimed to establish the demographic and situational factors that predict depressive symptoms in adolescents and young adults. Logistic regression analysis showed that the predictor variables are not the same for adolescents and emerging adults. This evidences that the stage of the life cycle in which the individual is in involves a set of characteristics and challenges that are changing throughout life (Papalia & Martorell, 2016), so understanding the onset of psychopathology requires a life-cycle perspective.

Regarding the factors that increase the likelihood of depression in adolescents, it was found that receiving economic income increases the likelihood of depressive symptoms, this may be because the income obtained comes from a job, assuming responsibility for their financial support (Liu, et al., 2021), unlike their peers who do not have income from work activity.

Regarding the factors that decrease the probability of presenting depression, it was found that young adults with low socioeconomic levels are less likely to present depressive symptoms; these results differ from the evidence that indicates that poverty is associated with depression (Ridley, et al., 2020). It has been found that adolescents belonging to a low socioeconomic condition are approximately twice as likely to suffer from depression and other mental pathologies than groups of high socioeconomic status (Mar, et al., 2022). This relationship has also been found in the older adult population in Spain, Poland, and Finland (Domènech, et al., 2018). One explanation could be that isolation was not equal for socioeconomic groups, e.g., in a study (with n= 1,944) where 27% lived in low-income areas, half reported performing their main activity outside the home while, this percentage was lower for high and middle-income groups. Low-income workers are generally employed in labor-intensive sectors and face-to-face work (formal and informal) which prevents them from fulfilling isolation (Oviedo, et al., 2020), and isolation was one of the factors that affected the mental health status of people during COVID-19 (Prieto-Molinaria, et al., 2020; Mautong, et al., 2021).

On the other hand, regarding the factors that increase the probability of presenting depression in young adults, it was found that young adults that took virtual classes during COVID-19 were more likely to present symptoms of depression. Virtual classes were one of the changes brought about by COVID-19, completely altering the social and pedagogical regularities of educational institutions. Consequently, it marked an increase in the level of demand for all the actors in educational institutions. In this study, it was found that young adults with virtual classes during COVID-19 were more likely to present symptoms of depression, which is consistent with the results of other studies (Mendoza, et al., 2022; Sundarasen, et al., 2020; Azmi, et al., 2022). In a study that addressed the experiences of students in about 62 countries, students expressed concerns about their academic achievement, careers, and experienced feelings of boredom, anxiety, and frustration (Aristovnik, 2020). In addition, depression has been associated with stress, worry, fear of exams, decreased productivity, and dissatisfaction with virtuality (Azmi, et al., 2022).

Insufficient statistical evidence was found to indicate that domestic violence predicts the presence of depressive symptomatology. However, the literature indicates that physical, emotional, and psychological violence, etc., have negative consequences in the short-term and long-term, such as depression (Howard, et al., 2010). It should be noted that most studies show a higher incidence of domestic violence and depression in the female gender because it is the population most affected by this problem (Sediri, et al., 2020; Bellizzi et al., 2020; Devries, et al., 2013). Almost one in three women is a victim of physical or sexual violence in her lifetime (Devries, et al., 2013). Thus, it is possible that a significant effect of domestic violence on depressive symptoms may be detected if controlled for gender.

On the other hand, some factors were found to predict depression in both adolescents and adults. The results indicated that for both young adults and

adolescents being female increases the probability of presenting depression, this coincides with most studies of gender and depression (Albert, 2015) and these differences are maintained in the conditions elicited by COVID- 19 (Pappa, et al., 2020). It has been established that these differences are explained because of physiological factors, and mechanisms distinctive to both genders (Howard, et al., 2017; Albert, 2015). In contrast, some studies have found an association between being male and depressive symptoms during the COVID-19 outbreak, in this regard, cultural and gender differences are argued, this is the case in China (Ren, et al., 2020; Liu, et al., 2021).

Regarding protective factors, it was found that a good health status decreases the likelihood of depression in both young and emerging adults. The connection between depression and health was detected in different research, indicating that people who have underlying health conditions are more likely to show symptoms of depression (Kris-Etherton, et al., 2021; Thapa, et al., 2020; Hyland, et al., 2020). Similarly, satisfaction with virtuality was a factor associated with less depression in both age groups. Adaptation to virtuality has been related to better mental health, this could be explained because students adapt better to virtual classes and isolation if they have a positive perception of loneliness, which could contribute to not experiencing feelings of loneliness and depression (Shamionov, et al., 2022).

One of the main strengths of this study is that we had a representative sample of young people from a Colombian city, so these results are extrapolated to other individuals in this population, but not to other regions of the world since economic, cultural, and social conditions vary among other factors. Thus, it is necessary to generate studies that consider these cultural differences in addition to the individual characteristics of the participants. Likewise, statistical techniques that are usually implemented in psychometric studies were used in this study, so that the measure of depressive symptoms can be assumed to be valid and reliable. On the other hand, the main limitation of this study is that the data of this study were obtained from a public repository, so it was not possible to establish a priori the variables that would be evaluated for each subject. Consequently, other psychological measures that are usually associated with depression, such as anxiety or perceived stress, are absent in this study. Therefore, to have a more holistic approach to how the pandemic favored the increase in the prevalence of symptoms associated with psychopathology, it is necessary to assess demographic, situational, psychological, as well as social characteristics that reflect the different expectations in which the individual develops.

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