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Psychological impact of COVID-19 pandemic in Spanish adolescents: risk and protective factors of emotional symptoms

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Abstract

The psychological impact of the COVID-19 pandemic on children and adolescents is one of the most prevalent concerns all over the world. Adolescence is a developmental stage of high vulnerability due to the challenges this period entails. Additionally, the health emergency crisis has put adolescents even more at risk of developing mental health problems. The present study aims to examine the influence of socio-demographic and COVID-19 related variables on symptoms of depression, anxiety and stress in adolescents during pandemic-related confinement in Spain. Participants were 523 adolescents (63.1% female), aged between 13 and 17 years (*M*=14.89 years; *SD*=1.13 years), who completed an ad hoc questionnaire, the Depression, Anxiety and Stress Scale (DASS-21) and The Oviedo Infrequency Scale (INFO-OV). A descriptive and cross-sectional study design was used, and descriptive statistics and multiple logistic regression analyses were conducted. Results indicate that socio-demographic and COVID-19 related variables play a significant role in the development of emotional symptomatology in adolescents during the current pandemic. Girls more than boys, adolescents who did volunteer work and those who stayed home more often were more likely to experience depression, anxiety or stress symptoms. Experiencing a stressing life event and searching for COVID-19 related information more often was related to psychological distress. On the other hand, adolescents who were in a romantic relationship and had been infected with the coronavirus, were more likely to be mentally healthy. Further research is necessary in order to detect risk and protective variables that impact adolescent's mental health during the COVID-19 pandemic.
Keywords: depression; anxiety; stress; COVID-19; adolescents.

Resumen

El impacto psicológico de la pandemia de COVID-19 en niños y adolescentes: factores de riesgo y protección de los síntomas emocionales. El impacto psicológico de la pandemia de COVID-19 en niños y adolescentes es una de las preocupaciones más frecuentes en todo el mundo. La adolescencia es una etapa de desarrollo de alta vulnerabilidad debido a los desafíos que conlleva este período. Además, la crisis de emergencia sanitaria ha puesto a los adolescentes en un riesgo aún mayor de desarrollar problemas de salud mental. El objetivo del presente estudio es examinar la influencia de las variables sociodemográficas y las relacionadas con COVID-19 en los síntomas de depresión, ansiedad y estrés en los adolescentes durante el confinamiento a causa de la pandemia en España. Los participantes fueron 523 adolescentes (63,1% mujeres), con edades comprendidas entre los 13 y los 17 años (*M*=14.89 años; *SD*=1.13 años), que cumplimentaron un cuestionario ad hoc, la Escala de Depresión, Ansiedad y Estrés (DASS-21) y la Escala de Infrecuencia de Oviedo (INFO-OV). Se utilizó un diseño descriptivo y transversal, y se realizaron estadísticos descriptivos y análisis de regresión logística múltiple. Los resultados indican que las variables sociodemográficas y las relacionadas con la COVID-19 desempeñan un papel importante en el desarrollo de la sintomatología emocional en los adolescentes durante la pandemia. Las chicas, los adolescentes que hicieron trabajo voluntario y los que se quedaron en casa con más frecuencia tuvieron más probabilidades de experimentar síntomas de depresión, ansiedad o estrés. Se necesitan más investigaciones para detectar las variables de riesgo y de protección que afectan a la salud mental de los adolescentes durante la pandemia de COVID-19.
Palabras clave: depresión; ansiedad; estrés; COVID-19; adolescentes.

The health crisis caused by coronavirus has already had a worldwide impact and will leave a deep, permanent mark in history. The first COVID-19 outbreak started on December, 2019 in Wuhan, China, and spread relentlessly all over the world (World Health Organization, 2020). The physical, psychological, social and economic impact this pandemic has had throughout the globe is yet to be understood,

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because this situation is not only extreme, but also unprecedented. Empirical studies about the influence of the health crisis on physical and mental health have been a priority in the scientific community, and literature on psychology is a crucial asset in this situation (Schimmenti, Billieux, & Starcevic, 2020).

The pandemic has led to significant economic and social changes. Many countries have adapted their policies to guarantee the safety of the population and prevent the virus from spreading, being quarantine one of those policies (Aloi et al., 2020). Unlike isolation, which refers to diagnosed patients, quarantine protocols urge citizens to remain home and avoid social contact (BOE 24/01/2020, 2020). In Spain, the state of alarm was proclaimed on March 14th, and mandatory confinement was decreed for everyone in the country, and prevailed until June 20th. Thus, people in Spain remained confined at home for three months, with all the consequences it entailed.

Traditionally, psychology has studied the effects of isolation on human behaviour, mental health and emotional state (Colwell & Kato, 2003). Isolation, including the lack of social contact and the confinement in an enclosed space, is associated with an increase in depressive symptoms, low self-esteem and suicidal thoughts and attempts (Hall-Lande, Eisenberg, Christenson, & Neumark-Sztainer, 2007). Confinement or quarantine on its own has a critical impact on mental health, especially in young people and adolescents, and it can be severely aggravated if it happens in the context of a worldwide pandemic (Mucci, Mucci, & Diolaiuti, 2020). In fact, confinement at home is an unprecedented measure in Spain, thus, little is yet known about the long-term effects on children and adolescents' mental health (Espada, Orgilés, Piqueras, & Morales, 2020).

Young people are particularly at risk in the current situation. Adolescence is a challenging period in life, due to the variety of physical, emotional and social changes, which increases the vulnerability of maladaptation and mental health problems (González-Carrasco, Casas, Malo, Viñas, & Dinisman, 2017). There is still little evidence yet, however recent studies have shown a high and positive correlation between the health crisis and severe psychological issues, which are especially prevalent in adolescents (Espada, Sussman, Huedo-Medina, & Alfonso, 2011; Liang et al., 2020).

Generally, depression, anxiety and stress have been particularly widespread among Spanish adolescents – often diagnosed simultaneously due to their high comorbidity rates, they are among the most common affective disorders (Canals, Voltas, Carmen Hernández-Martínez, Cosi, & Arija, 2019). These psychopathologies are the main focus of researchers regarding the psychological impact of COVID-19 and its variations in adolescent population, showing moderate to severe levels of all three affective disorders (Ozamiz-Etxebarria, Dosil-Santamaria, Picaza-Gorrochategui, & Idoiaga-Mondragon, 2020). These alarming results call for urgent measures to further study adolescents' psychopathology during the current pandemic, given the recent evidence that depression, anxiety and stress are growing worldwide (Wang et al., 2020). Research on the COVID-19 pandemic and the impact on youth's mental health reveals the variety of variables that may play a role in the development of emotional symptomatology (Ozamiz-Etxebarria et al., 2020).

Research on emotional problems show that girls are more likely to experience symptoms of depression, anxiety and stress than boys, especially during adolescence (De la Barrera, Schoeps, Gil-Gómez, & Montoya-Castilla, 2019; Resurrección, Salguero, & Ruiz-Aranda, 2014). According to the literature on emotional adjustment, girls are more vulnerable to psychological distress than boys, due to the different ways of socializing and coping with their problems (Gomez-

Baya, Mendoza, Paino, & De Matos, 2017). Gender appears to be a risk factor during COVID-19, given the fact that female gender has been identified as a predictor in a greater psychological impact of the current situation, emphasizing the vulnerability young girls already experience (Brooks et al., 2020).

There are other demographic variables associated with psychological distress. Regarding age, older adolescents are more likely to experience psychological problems, compared to younger adolescents, due to the accumulated adjustment problems they experience as they grow (Hagquist, 2010). Household size, doing volunteer work and being in a romantic relationship have also been studied as potential protective or risk factors during confinement, but results are still non-conclusive (Bryant et al., 2020; Okabe-Miyamoto, Folk, Lyubormirsky, & Dunn, 2020; Wang et al., 2020).

Experiencing stressing life events has been identified as a significant risk factor, regarding young people's emotional state. Thus, adolescents who reported having lived such an event during the COVID-19 pandemic are more vulnerable to psychological distress than those who have not (Bernardi, Spini, & Oris, 2016). In addition, the tendency of searching for information or the mere exposure to the news has been directly associated with higher psychological problems and negative emotions (Losada-Baltar et al., 2020). Furthermore, research suggests that young people who have been infected with COVID-19, who have had a sick relative with coronavirus, and who have lost a significant relative to the illness, are at potential risk of presenting mental health problems, due to the immediacy and severity of these events (Menzies & Menzies, 2020).

The variety of risk factors that may influence adolescents' mental health and well-being during confinement conveys the need of a holistic empirical approach that studies the combined impact on youth's emotional symptomatology. Demographic variables are key to understand adolescents' emotional state, thus studying their relationship with youth's mental health could help identifying protective and risk factors that play a significant role during this pandemic. The aim of this study was to examine the extent to which demographic variables and COVID-19 related variables predict symptoms of depression, anxiety and stress in adolescents during pandemic-related confinement or quarantine. For that purpose, we hypothesized that 1) girls will be more likely to experience depression, anxiety and stress symptoms than boys, 2) younger age, a bigger household, doing volunteer work and being in a romantic relationship will be protective factors against depression, anxiety and stress symptoms and 3) COVID-19 related variables will predict depression, anxiety and stress symptoms.

Method

Participants

Participants were 523 Spanish adolescents, 330 (63.1%) female, 187 (35.8%) male, 1 non-binary (0.20%) and 5 people who did not express their gender (0.90%) with age ranging between 13 and 17 years (*M*=14.89 years; *SD*=1.13 years). Inclusion criteria for the study were: (1) age from 13 to 17 years, (2) to spend the COVID-19 health crisis in Spain and (3) to score below 25% in The Oviedo Infrequency Scale (INF-OV) (Fonseca-Pedrero et al., 2010), which detects participants who answered randomly to the questionnaires. The original sample was composed of 653 participants, 130 were eliminated because they didn't match the inclusion criteria, reducing the final sample to a total of 523 participants that were included in this study. No participants were removed from the sample due to missing data, since all relevant items must be answered in order to submit the survey.

Measures

Socio-demographic data were collected through an ad-hoc questionnaire. Participants were asked about their gender, age, household situation (whether they lived in an apartment or a house, and how many people they shared their home with), whether they did volunteer work, and if they were in a romantic relationship. Regarding COVID-19 related questions, participants were asked if they had experienced a stressful life event during the pandemic (such as the death of a loved one, a divorce, or a disease, among others, not directly associated with coronavirus), how often they left the house or searched coronavirus-related information, whether they have been infected with the coronavirus, one of their relatives had suffered the illness, or if a close friend or relative had passed away as a consequence of COVID-19.

Emotional symptomatology was assessed through the Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995), which consists of 21 items ranked on a three-point Likert-type scale, ranged from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time), divided equally in three subscales namely depression (e.g. "I couldn't seem to experience any positive feeling at all"), anxiety (e.g. "I was aware of dryness of my mouth") and stress (e.g, "I found it difficult to relax"). This scale showed good reliability indexes in the study's sample (depression: Cronbach's α= .89; anxiety: Cronbach's α= .84; stress Cronbach's α= .85). The construct validity of the scale was tested and the 3-factor structure showed an adequate fix (Basha & Kaya, 2016).

Infrequency was measured through The Oviedo Infrequency Scale (INFO-OV) (Fonseca-Pedrero et al., 2010). Four out of twelve items were chosen to assess whether the participants responded randomly to the rest of the questionnaires, each item a five-point Likert-type scale ranged from 1 (totally disagree) to 5 (totally agree) (e.g. "I know people who wear glasses"). Participants who scored above 25% in the scale were removed from the sample.

Procedure

This study follows the Helsinki Declaration ethical code (World Medical Association, 2013) and has the approval of the University of Valencia's Ethics Committee. All participants were informed of the confidentiality of their participation, which was voluntary, and the anonymity of their responses.

Adolescents younger than 14 years were contacted through their schools, which have previously given their consent to participate in the study. Family members with custody or parental authorities provided a physical written consent for the children's participation, according to the Organic Law on Personal Data Protection and guarantee of digital rights (BOE 06/12/18, 2018). The link to the questionnaires was provided via the schools, which included information about the study conditions.

Participants older than 14 years were contacted via social media, where information about the study was published and participants shared it further, through a snowball sampling method. The main spreading platform was WhatsApp, but Facebook, Instagram and Twitter were used as well. This information was displayed in a poster-like image that included a written consent, the study conditions, and the link to an online survey.

All participants completed the questionnaires in about 15 minutes from their own mobile devices at homes. Data were collected through an online questionnaire on Limesurvey, through the months of May, June and July 2020, when COVID-related isolation policies were withdrawn.

Statistical analysis

A descriptive, cross-sectional design was used, and the data were analysed using SPSS (26.0 version). Sample characteristics were studied through frequency and descriptive analysis. Chi-square test and multiple logistic regression analysis (backward method) were conducted to study the relationship among variables. To study sample characteristics, participants were categorized according to their depression, anxiety and stress levels, according to the cut-off scores provided by the original authors of the DASS-21 (Lovibond & Lovibond, 1995). For that purpose, participants were assigned to pre-established categories (normal, mild, moderate, severe or extremely severe symptoms) according to their scores in each dimension, and further analysis were conducted according to those categories. For the regression analysis, the sample was divided into two different groups, whether they (1) did not show any emotional symptomatology or (2) showed mild, moderate or severe depression, anxiety or stress symptoms. As most of the variables are categorical, chi-square indexes were calculated, except for age and number of people in the household, which are continuous variables.

Results

Descriptive statistics

In order to conduct descriptive analyses, the sample was divided according to their scores in depression, anxiety and stress symptoms (Table 1).

Table 1. Descriptive statistics and sample distribution according to their depression, anxiety and stress levels

	Depression		Anxiety		Stress	
	Frequency	%	Frequency	%	Frequency	%
Normal	274	52.4	282	53.9	284	54.3
Mild	59	11.3	29	5.5	59	11.3
Moderate	71	13.6	79	15.1	65	12.4
Severe	31	5.9	29	5.5	47	9.0
Extremely severe	41	7.8	57	10.9	21	4.0
Missing	47	9.0	47	9.0	47	9.0
Total	523	100	523	100	523	100
Mean (SD)	9.94 (9.94)		8.15 (8.83)		13.59 (10.03)	
Range	0–42		0–42		0–42	

Analysis of related factors of depression, anxiety and stress during the COVID-19 outbreak

Multiple logistic regression analysis with backwards method were conducted to predict to which extent socio-demographic and COVID-19 related variables predict depression, anxiety and stress symptoms. For that purpose, participants were classified, regarding their score on the DASS-21 questionnaire, into two groups, whether they had experienced or not depression, anxiety or stress symptoms.

Table 2. Multiple logistic regression analysis of depression-related factors during the COVID- 19.

Factors	Non-depression group (n = 271)	Depression group (n = 201)	χ^2	p	Multiple logistic regression analysis (backwards)		
					B (SE)	p	OR [95% CI]
GENDER							
Female	164 (52.9%)	146 (47.1%)					0.31
Male	106 (67.9%)	50 (32.1%)	12.36	.002	-1.17 (.36)	.001	[0.16 - 0.63]
Others	0 (0.0%)	2 (100.0%)					
AGE 13-17 years			0.57	.967			
HOUSEHOLD 1-9 people			5.00	.287			
LIVING SITUATION							
Apartment Without Balcony	27 (24.9%)	36 (57.1%)					0.68
Apartment With Balcony	147 (59.5%)	100 (40.5%)	6.60	.037	*-0.39 (.23)*	*.088*	[0.43 - 1.06]
House With Garden	52 (61.9%)	32 (38.1%)					
VOLUNTEER WORK							
Yes	2 (28.6%)	5 (71.4%)	3.37	.066	*1.58 (.89)*	*.076*	4.87
No	127 (62.9%)	75 (37.1%)					[0.85 – 27.99]
BOY/GIRLFRIEND							
Yes	11 (44.0%)	14 (56.0%)	3.78	.052	-0.98 (.46)	.032	0.38
No	118 (64.1%)	66 (35.9%)					[0.15 - 0.92]
MODEL 1: R^2 = .10 (Cox & Snell), .14 (Nagelkerke). χ^2 (4) = 22.67, p < .001							
LIFE EVENT							
Yes	26 (40.0%)	39 (60.0%)	9.59	.002	-0.93 (.30)	.002	0.40
No	200 (60.8%)	129 (39.2%)					[0.22-0.72]
LEAVING THE HOUSE							
Every day	97 (62.6%)	58 (37.4%)					1.38
Few times per week	102 (57.0%)	77 (43.0%)	5.49	.064	0.32 (.16)	.045	[1.01 - 1.89]
< 1 Time per week	27 (45.0%)	33 (55.0%)					
INFORMATION COVID-19							
< 30 Min per day	188 (58.0%)	136 (42.0%)					
30 Min – 1 h per day	26 (53.1%)	23 (46.9%)	0.43	.807			
> 1 H per day	12 (57.1%)	9 (24.9%)					
COVID-19 VICTIM							
Yes	14 (82.4%)	3 (17.6%)	4.67	.031	-1.39 (.67)	.037	0.25
No	184 (55.8%)	146 (44.2%)					[0.07 – 0.92]
COVID-19 VICTIM IN FAMILY							
Yes	42 (55.3%)	34 (44.7%)	0.26	.614			
No	169 (58.5%)	120 (41.5%)					
COVID-19 DEATH CLOSE							
Yes	16 (57.1%)	12 (42.9%)	0.01	.98			
No	210 (57.4%)	156 (42.6%)					
MODEL 2: R^2 = .05 (Cox & Snell), .07 (Nagelkerke). χ^2 (2) = 18.67, p < .001							

Table 3. Multiple logistic regression analysis of anxiety-related factors during the COVID-19.

Factors	Non-anxiety group (n = 279)	Anxiety group (n = 193)	χ^2	p	Multiple logistic regression analysis (backwards)		
					B (SE)	p	OR [95% CI]
GENDER							
Female	171 (55.2%)	139 (44.8%)	12.40	.006	-0.72 (.36)	.044	0.48
Male	107 (68.6%)	49 (31.4%)					[0.24 - 0.98]
Others	0 (0.0%)	2 (100.0%)					
AGE 13-17 years			2.89	.575			
HOUSEHOLD 1-9 people			4.33	.363			
LIVING SITUATION							
Apartment without balcony	36 (57.1%)	27 (42.9%)	3.95	.139			
Apartment with balcony	145 (58.7%)	102 (41.3%)					
House with garden	59 (70.2%)	25 (29.8%)					
VOLUNTEER WORK							
Yes	2 (28.6%)	5 (71.4%)	6.05	.014	1.89 (.86)	.028	6.64
No	145 (71.8%)	57 (28.2%)					[1.22 – 35.97]

Factors	Non-anxiety group (n = 279)	Anxiety group (n = 193)	χ^2	p	Multiple logistic regression analysis (backwards)		
					B (SE)	p	OR [95% CI]
BOY/GIRLFRIEND							
Yes	15 (60.0%)	10 (40.0%)	1.45	.228			
No	132 (71.7%)	52 (28.3%)					
MODEL 1: R² = .05 (Cox & Snell), .07 (Nagelkerke). χ² (2) = 9.856, p = .007							
LIFE EVENT							
Yes	29 (44.6%)	36 (55.4%)	8.69	.003	-1.02 (.30)	.001	0.36
No	211 (64.1%)	118 (35.9%)					[0.20 – 0.65]
LEAVING THE HOUSE							
Every day	100 (64.5%)	55 (35.5%)	1.71	.424			
Few times per week	103 (57.5%)	76 (42.5%)					
< 1 Time per week	37 (61.7%)	23 (38.3%)					
INFORMATION COVID-19							
< 30 MIN PER DAY	208 (64.2%)	116 (35.8%)	8.31	.016	0.42 (.21)	.047	1.52
30 MIN – 1 H PER DAY	22 (44.9%)	27 (55.1%)					[1.01 - 2.31]
> 1 H PER DAY	10 (47.6%)	11 (52.4%)					
COVID-19 VICTIM							
Yes	11 (64.7%)	6 (35.3%)	.13	.717			
No	199 (60.3%)	131 (39.7%)					
COVID-19 VICTIM IN FAMILY							
Yes	47 (61.8%)	29 (38.2%)	.04	.838			
No	175 (60.6%)	114 (39.4%)					
COVID-19 DEATH CLOSE							
Yes	17 (60.7%)	11 (39.3%)	.01	.982			
No	223 (60.9%)	143 (39.1%)					
MODEL 2: R² = .05 (Cox & Snell), .06 (Nagelkerke). χ² (2) = 15.87, p < .001							

Table 4. Multiple logistic regression analysis of stress-related factors during the COVID- 19.

Factors	Non-stress group (n = 281)	Stress group (n = 191)	χ^2	p	Multiple logistic regression analysis (backwards)		
					B (SE)	p	OR [95% CI]
GENDER							
Female	170 (54.8%)	140 (45.2%)					0.33
Male	109 (69.9%)	47 (30.1%)	9.84	.007	-1.11 (.41)	.007	[0.15- 0.74]
Others	1 (50.0%)	1 (50.0%)					
AGE 13-17 years			2.25	.691			
HOUSEHOLD 1-9 people			5.58	.233	-0.36 (.21)	.085	0.70 [0.46- 1.05]
LIVING SITUATION							
Apartment without balcony	36 (57.1%)	27 (42.9%)					
Apartment with balcony	149 (60.3%)	98 (39.7%)	0.80	.670			
House with garden	54 (64.3%)	30 (35.7%)					
VOLUNTEER WORK							
Yes	3 (42.9%)	4 (57.1%)	3.296	.071	1.59 (.83)	.055	4.92
No	149 (73.8%)	53 (26.2%)					[0.96 - 25.14]
BOY/GIRLFRIEND							
Yes	14 (56.0%)	11 (44.0%)	4.01	.045	-0.94 (.47)	.044	0.39
No	138 (75.0%)	46 (25.0%)					[0.16 - 0.98]
MODEL 1: R² = .09 (Cox & Snell), .13 (Nagelkerke). χ² (4) = 19.64, p < .001							
LIFE EVENT							
Yes	32 (49.2%)	33 (50.8%)	4.26	.039	-0.58 (.29)	.047	0.56
No	207 (62.9%)	122 (37.1%)					[0.32 – 0.99]
LEAVING THE HOUSE							
Every day	95 (61.3%)	60 (38.7%)					
Few times per week	107 (59.8%)	72 (40.2%)	0.11	.947			
< 1 Time per week	37 (31.7%)	23 (38.3%)					
INFORMATION COVID-19							
< 30 Min per day	200 (61.7%)	124 (38.3%)					
30 Min – 1 h per day	28 (57.1%)	21 (42.9%)	0.01	.603			
> 1 H per day	11 (52.4%)	10 (47.6%)					

Factors	Non-stress group (n = 281)	Stress group (n = 191)	χ²	p	Multiple logistic regression analysis (backwards)		
					B (SE)	p	OR [95% CI]
COVID-19 VICTIM							
Yes	12 (70.6%)	5 (29.4%)	0.76	.384			
No	198 (60.0%)	132 (40.0%)					
COVID-19 VICTIM IN FAMILY							
Yes	42 (55.3%)	34 (44.7%)	1.12	.289			
No	179 (61.9%)	110 (38.1%)					
COVID-19 DEATH CLOSE							
Yes	17 (60.7%)	11 (39.3%)	0.01	.995			
No	222 (60.7%)	144 (39.3%)					
MODEL 2: R² = .01 (Cox & Snell), .02 (Nagelkerke). χ² (1) = 3.95, p = .047							

Three different regression models were conducted for each of the DASS-21 scales.

Regarding depression (Table 2), girls are more likely to experience depression symptoms than boys during the pandemic. Young people who were in a romantic relationship, were less likely to present symptoms of depression. Doing volunteer work and living in an apartment without balcony also contributed to depression symptoms. Adolescents who have experienced an important life event during the pandemic, were more likely to feel depressed. The more time adolescents spent at home without leaving the house much, the more depressed they felt. Adolescents who have been a victim of COVID-19 are less likely to present symptoms of depression.

Regarding anxiety (Table 3), girls are more likely to experience anxiety symptoms than boys during the pandemic. Adolescents who were doing volunteer work during the COVID-19 outbreak were more likely to feel anxious. Young people who had experienced an important life event, were also more likely to present symptoms of anxiety. The more time adolescents spent watching/searching the news about COVID-19, the more anxious they felt.

As for stress (Table 4), girls were more likely to experience stress symptoms than boys during the pandemic. Young people who were in a romantic relationship, were less likely to present symptoms of stress. Doing volunteer work and living in a small household also contributes to stress symptoms. Adolescents who have experienced an important life event during the pandemic, were more likely to feel stressed.

Discussion

The aim of this study was to examine the influence of demographic variables and COVID-19 related variables on depression, anxiety and stress in adolescents during the pandemic. We conducted chi-square test and multiple logistic regression analysis, in order to assess the predictive value of the socio-demographic and COVID-19 related variables.

First, we expected that girls would be more likely to experience depression, anxiety and stress symptoms than boys. Our results confirm the first hypothesis, showing that girls were more likely to experience emotional symptoms in all three dimensions. These results are consistent with previous studies that indicate that girls are more vulnerable to psychological distress than boys (De la Barrera et al., 2019). This finding might reflect the different ways in which adolescents are socialized differently according to their gender. Generally, girls tend to have less confidence in their social and emotional skills, hence they are less likely to develop effective coping strategies, leading to a poorer adjustment and more psychological problems (Gomez-Baya et al., 2017). Moreover, these results are in line with research on the psychological impact of COVID-19, which identifies female gender as a risk factor that enhances the vulnerability of young people during this pandemic (Brooks et al., 2020).

Our results partially support the second hypothesis, which expected that adolescents of younger age, a bigger household, doing volunteer work and being in a romantic relationship would be protective factors against depression, anxiety and stress symptoms. Age was not a significant predictor of emotional symptomatology, in contrast with previous research that indicates that older adolescents are more likely to experience psychological problems (Hagquist, 2010). The small age range in our sample could explain our findings – a larger range of participants' age might yield significant differences in a regression analysis. Household-related variables were not consistent predictors of psychological symptoms as they were expected. Adolescents who stayed at home more often were more likely to experience depression symptoms, but they did not feel more anxious or stressed. Adolescents who lived in a smaller home reported more stress symptoms, while those who lived in an apartment without a balcony expressed more depression symptoms. Research regarding household conditions during COVID-19 is still scarce, and there are some results that suggest that the major predictor of mental stability is not the home itself, but the number of people living together (Okabe-Miyamoto et al., 2020). Adolescents who were in a romantic relationship were less likely to experience symptoms of depression or stress, which could be a consequence of social support or receiving affection from a loved one, but research on the matter is still scare regarding its association with COVID-19 related confinement. Contrary to what was hypothesized, adolescents who did volunteer work were more likely to feel depressed, anxious and stressed. These results might be explained by the fact that young people who volunteer are more exposed to the suffering of others and are more aware of the negative aspects of the illness, which could lead to emotional distress, in contrast to the benefits of volunteering prior to the pandemic (Bryant et al., 2020).

With regard to the third hypothesis, we expected that COVID-19 related variables would predict depression, anxiety and stress symptoms. Results partially confirm this hypothesis, showing that experiencing a stressful life event during the pandemic predicted depression, anxiety and stress symptoms, which constitutes a significant risk to adolescents' mental health in COVID-19 related confinement (Bernardi et al., 2016). Searching for COVID-19 related information was only associated with more anxiety symptoms, which might be due to the frequent exposure to negative news and the latent feeling of uncertainty, making adolescents feel anxious rather than depressed or stressed (Losada-Baltar et al., 2020). Adolescents who had been infected with COVID-19 were less likely to present symptoms of depression, which was not consistent to previous research about the fear of health-related mortality (Menzies & Menzies, 2020). This could be explained by the common belief that people who recover from the illness often develop coronavirus-specific antibodies that might immunize the patient from

catching the virus again or transmitting it to others. In addition, they experience a feeling of protection that prevents them from developing symptoms of depression, probably through the mediating role of social support (González-Sanguino et al., 2020).

In conclusion, our findings indicated that the main protective factors regarding adolescents' emotional symptomatology are associated with being in a romantic relationship and, contrary to what was expected, having recovered from the COVID-19. Moreover, some risk factors were identified, such as being a girl, living in a small household or not going outside often, doing volunteer work, searching for COVID-19 related information more often and having experienced a stressful life event, which lead to developing depression, anxiety or stress symptoms.

In light of these results, this study contributes to the most recent literature on COVID-19 and the psychological impact on adolescents, which is still scarce. There is an urgent need for more empirical evidence about the specific factors might play a role in the adaptation process during these difficult times. This study has identified some of the potential protective or risk factors for adolescents' mental health. This might be an important contribution in order to design effective intervention programs promoting adolescents' psychological health and well-being during the COVID-19 pandemic. Those intervention programs should target those adolescents, who are more vulnerable in order to prevent future emotional symptomatology. Political and social actions are crucial, and they should rely on studies like the current one to design effective, focused policies for young people.

However, this study is not without limitations. Data was collected through self-report measures, which presents possible bias in the responses, and the one-sided view of the adolescent's psychological conditions. More objective, unbiased measures are recommended in future studies addressing youth's mental situation during this pandemic. Also, we used a snowball sampling method, which makes it difficult to generalise these results in different populations or age groups. In future research, a randomized sampling method is most recommended to guarantee the scientific rigor of the study. Finally, this study provided information about the adolescents' emotional state during isolation, but there is no comparison with their emotional symptomatology prior the pandemic, therefore these results must be interpreted with caution.

In conclusion, this study makes an important contribution to COVID-19 literature by providing evidence on the demographic and COVID-19 related variables that might influence adolescents' mental health. The current situation calls for immediate measures that deal with the deep impact of confinement and quarantine in addition to the uncertainty that the population suffers in general, and adolescents in particular. More studies such as this one are necessary to identify the relevant protection factors for adolescents' mental health, or the factors that entail the greatest risk. We encourage further research in this matter, which is now essential to tackle the emotional and psychological problems associated with the pandemic, and that will be the key to protect and ensure youth's mental health in the future.

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Conflict of interests

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