SÍNTOMAS SOMÁTICOS, ANSIEDAD Y MIEDO ENTRE CHICOS Y ADOLESCENTES ESPAÑOLES DURANTE LA SEGUNDA OLA POR COVID-19: UN ESTUDIO DESCRIPTIVO

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Resumen. Introducción: La emergencia por la pandemia por COVID-19 tiene consecuencias entre niños y adolescentes. El objetivo del presente estudio es 1) evaluar el miedo al COVID-19, la ansiedad, los síntomas somáticos y las reacciones emocionales y 2) investigar las relaciones entre variables como género, edad y curso.

Metodología: 199 niños y adolescentes españoles (desde 3º de Educación Primaria hasta 2º bachillerato) con una media de edad de 12.48 años. Se usaron los instrumentos miedo al COVID-19 (FCV-19S), la versión corta del STAI y el PHQ-15.

Resultados: 1) los estudiantes no tienen ni miedo ni ansiedad ni síntomas somáticos; 2) las chicas presentan más síntomas somáticos; 3) el grupo de edad de 12.49-18 años tienen más ansiedad rasgo y niveles de somatización en comparación con el grupo de edad de 8-12.48 años; 4) estudiantes de secundaria muestra una mayor prevalencia de emociones desagradables en comparación con los estudiantes de primaria y de bachillerato; 5) emociones desagradables están relacionadas con miedo al COVID-19, ansiedad rasgo, somatización y la edad (chicos mayores); y 6) encontramos presencia de comorbilidad psicológica y/o psiquiátrica.

Conclusión: Este estudio proporciona pone de manifiesto las asociaciones entre las reacciones emocionales en la segunda ola de COVID-19 y la salud mental en los jóvenes, con especial interés en las niñas, los estudiantes entre 12,49 y 18 años y los escolares de secundaria que mostraron mayores emociones desagradables (miedo, ira, asco, tristeza y culpa). Estudios futuros deberían explorar estos aspectos como factor de riesgo de síntomas psicopatológicos.

Palabras clave: COVID-19; salud mental; ansiedad; miedo; estudiantes.

SOMATIC SYMPTOMS, ANXIETY AND FEAR OF COVID-19 AMONG CHILDREN AND ADOLESCENTS IN SPAIN DURING THE SECOND WAVE OF COVID-19: A DESCRIPTIVE CORRELATION STUDY

Abstract. Introduction: The emergence of the COVID-19 pandemic has consequences among children and adolescents. The present study aimed 1) to assess fear of COVID-19, anxiety, somatic symptoms and emotional reaction and 2) to investigate relationships between variables such as gender, age and course. Methodology: 199 Spanish children and adolescents (from Year 3 of Primary Education to Year 2 of Baccalaureate) with a mean age of 12.48 years. We used the Fear of COVID-19 Scale (FCV-19S), the short form of STAI and PHQ-15.
Results: 1) school students present neither fear, nor anxiety, nor symptomatic symptoms; 2) girls present more somatic symptoms; 3) the 12.49-18 years age group presents greater trait anxiety and levels of somatization compared with the younger children in the 8-12.48 year group; 4) secondary school students show a greater prevalence of unpleasant emotions compared to their counterparts in primary education and baccalaureate; 5) unpleasant emotions are related to fear of COVID-19, trait anxiety, somatizations and age (older children); and 6) we found a presence of psychological and/or psychiatric comorbidity.
Conclusion: This study provides an insight into the associations in the second wave of COVID-19-related emotional reactions and mental health outcomes in young people with special interest in girls, students between 12.49 and 18 years and the secondary school children who reported prevalence of unpleasant emotions (fear, anger, disgust, sadness, and guilt). Further studies should explore these aspects as a risk factor for psychopathological symptoms.

Keywords: COVID-19; mental health; anxiety; fear; students.

Introduction

Since December 2019, an outbreak of a novel coronavirus disease (COVID-19) has spread from Wuhan (China) all round the world, affecting millions of people on every continent (WHO, 2020a). In order to control COVID-19, most nations have implemented many restrictions in the general population such as social distancing, mandatory quarantine, self-isolation, mask wearing, etc., as well as measures to restrict people from going outside and to prevent further spread of the virus. Many of these measures have psychological impacts on mental health, such as infection fears, frustration, boredom, financial loss, worries, stress, anxiety, depression and social stigma (Brooks et al., 2020a; Lin, 2020; Rubin & Wessely, 2020; Wang et al., 2020).

Children and adolescents are a potentially vulnerable group in this respect. While the COVID-19 death rate in younger populations has been reported to be lower than among older people (WHO 2020b), children and adolescents suffer from social distancing and self-isolation caused by school closures and other dramatic changes in their environment, with the current pandemic having significantly affected the emotional and behavioral experience of children and adolescents (Meherali et al., 2021). In fact, the COVID-19 outbreak and lockdown may have multiple consequences on the lives of children and adolescents: fear, stress, anxiety, worry for their families, unexpected bereavements, sudden interruptions to school, sadness, home confinement, increased time of access to the Internet and social media, concern about the economic future of their family and country, difficulty in concentrating, disruptions to sleeping patterns, changes in eating habits, consequences of reduced vision from smartphone/Internet addiction, lack of development of proper emotional reactions and coping techniques, etc. (Duan, et al.,

2020; Singh et al., 2020; Son et al., 2020). Thus, the impact of COVID-19 on the mental health of children and adolescents is of great concern.

In consequence, there is an urgent need to assess the effects of the current pandemic on the mental health and well-being of school students and many researchers have appealed to the need for a long-term examination of and appropriate psychological care for adolescents in the emerging COVID-19 pandemic (Brooks et al., 2020b; Lee, 2020; Masuyama, Shinkawa & Kubo, 2020; Viner et al., 2020; Singh et al., 2020; Son et al., 2020). As the pandemic continues, it is important to monitor the impact on children's and adolescents' mental health status and to look at how to help them improve their mental health outcomes in the time of the current or future pandemics, given that it seems there will continue to be different waves and virus mutations (Meherali, et al., 2021).

Against this backdrop, one of the most controversial measures taken during lockdown for many countries in all the world has been the closure of schools, educational institutes, universities, and academic and extracurricular activities for children and adolescents (Meherali, et al., 2021; Panovska-Griffiths et al., 2020; Singh et al., 2020). In order to compensate for the loss of education during lockdown, many schools have offered distance learning or online courses to students and digital teaching to maintain academic progress during lockdown periods (Brooks et al., 2020b; Singh et al., 2020).

To avoid children and adolescents experiencing a prolonged state of physical isolation from their peers, teachers, extended family, and community networks, gradually, with the start of the new school year after the summer and considering the progress of the pandemic at world level and the number of cases and deaths, countries have been reopening schools. Students have been affected by different degrees of restrictions depending on local and temporal variations in the incidence of infection, with different educational modalities being implemented, an example being a full time and a part-time rota system with 50% of students attending school on alternate weeks, etc. (Panovska-Griffiths et al., 2020).

In Spain, when the new school year was due to start, the health and education authorities, considering how the pandemic was evolving and the de-escalation process conducted in the plan for the transition to a new normality (Monge et al., 2021), decided to reopen all educational institutions from September 2020, from primary school to university. Measures were introduced, however, with the most significant being compulsory mask wearing at all times, social distancing, the use of hydroalcoholic hand gel, taking students' temperatures, class groups isolated from others, and smaller class numbers.

The aim of the present study was, then, to determine the mental and emotional health status of children and adolescents enrolled in primary and secondary education and baccalaureate in Talavera de la Reina (Toledo, Spain), and to examine the relationship with some variables as gender, age and course.

Method

Participants

The target population comprised students in four schools and different years in Talavera de la Reina (Toledo, Castilla-La Mancha) (n=199). Non-probability quota sampling was used (aged from 8 to 18, enrolled at school from Year 3 of primary education to year 2 of baccalaureate) (see Table 1).

Table 1
Socio-demographic data

Entire Cohort	(n= 199)
Age (mean. SD)	12.48 (2.72)
Median. Range	12 (8-18)
Younger (8-12.48) (n. %)	107 (53.7%)
Older (12.49-18) (n. %)	92 (46.2%)
Gender (n. %)	
Male	103 (51.8%)
Female	96 (48.2%)
School year (n. %)	
Third year primary	13 (6.5%)
Fourth	14 (7%)
Fifth	31 (15.6%)
Sixth	22 (11%)
Total Primary school	**80 (40.2%)**
1ºESO (compulsory secondary school)	33 (16.6%)
2ºESO	19 (9.5%)
3ºESO	22 (11.1%)
4ºESO	11 (5.5%)
Total Secondary school	**85 (42.7%)**
1º Baccalaureate	21 (10.6%)
2º Baccalaureate	13 (6.5%)
Total Baccalaureate	**34 (17%)**

The sampling process was carried out with the collaboration of the schools' academic secretary offices, who sent an email to the students informing of this study. Social media and WhatsApp were also used among students, colleagues, friends and families.

Instruments

An anonymous on-line questionnaire was developed. The first part was designed to collect background demographic information on gender, age, and school year.

Second was the Fear of COVID-19 Scale (FCV-19-S). This is a new scale created by Ahorsu et al. (2020), which measures the severity of respondents' fear of COVID-19. This seven-item scale has a stable unidimensional structure with robust psychometric properties. Factor loadings (.66 to .74) and corrected item-total correlation (.47 to .56) of the Fear of COVID-19 Scale were found to be acceptable. The internal consistency and the test-retest reliability of the scale (α = .82 and ICC = .72) was acceptable. Participants indicate their level of agreement with the statements using a five-item Likert type scale. Answers include "strongly disagree," "disagree," "neither agree nor disagree," "agree," and "strongly agree". The minimum score possible for each question is 1, and the maximum is 5. A total score is calculated by adding up each item score (ranging from 7 to 35). The higher the score, the greater is the fear of Covid-19. The scale has been translated and validated in several cultures and languages (Alyami, Henning, Krägeloh & Alyami, 2020; Reznik et al., 2020; Sakib et al., 2020; Soraci et al., 2020; Satici, Gocet-Tekin, Deniz & Satici, 2020) with similarly good psychometric properties. We used the Spanish version of the Fear of COVID-19 Scale, which has been validated in Spanish university students, with the study confirming the structure of the original scale and with robust psychometric properties (Martínez-Lorca et al., 2020).

Third, the State-Trait Anxiety Inventory (STAI) questionnaire was used (van Knippenberg, Duivenvoorden, Bonke & Passchiner, 1990). These authors were the first to assess trait anxiety and state anxiety, using a brief 6-item version of the original STAI (Spielberger, 1983), obtaining good psychometric properties and a consistent structure (α = 0.80 in state anxiety and α = 0.88 in trait anxiety). This version comprised six items per

scale with a minimum score of 0 and a maximum of 18. The items used were state anxiety Items 2, 4, 11, 15, 17 and 18, and trait anxiety Items 7, 14, 15, 16, 17 and 18. The answers included 4 alternatives (scored from 0 to 3). This short version has been adequately validated in university population (Buela-Casal & Guillén-Riquelme, 2017).

Fourth, we administered the Patient Health Questionnaire PHQ-15 developed by Kroenke & Spitzer (2002). This is a self-administered questionnaire on 15 somatic symptoms in the last seven days. The PHQ-15 comprises 15 somatic symptoms, each symptom scored from 0 ("not bothered at all") to 2 ("bothered a lot"). The total PHQ-15 score ranges from 0 to 30 and scores of ≥5, ≥10, ≥15 represent mild, moderate, and severe levels of somatization. The Cronbach's α is 0.8. For this research, we used the Spanish version of the PHQ-15 by Ros Montalbán et al. (2010) with adequate psychometric properties (Cronbach's α .78). However, as the present research as conducted with minors, we omitted Items 4 and 11 with scores ranges from 0 to 26 (APA, 2020).

Finally, we asked participants about the presence of the following emotions: fear, anger, guilt, disgust, sadness, surprise, curiosity, admiration, security, and joy (Aguado, 2014; 2015) in the last seven days. Subjects choose only the emotion that was most present presence in the last seven days.

All participants gave their signed informed consent.

Procedure

The study design was descriptive, epidemiological and cross-sectional.

Participants were recruited by e-mail. They received an e-mail from the school secretary explaining the aim of the research and including a link to the questionnaire (Google Forms®). Informed consent was obtained electronically before data were collected from the participants

This study received was approved and supervised by the Research Ethics Commission of the Talavera de la Reina Integrated Health Service Management in Talavera de la Reina, Toledo, Spain (11/2020).

Data collection began on 5 November 2020 and ran until 15 November. The online questionnaire was openly accessible over 10 days, from 5 November 2020 to 15 November 2020 (Google Forms®). Students, colleagues, friends and families were also asked to invite others students to respond.

Data analysis

The data were analysed using the IBM® SPSS® Statistics 22.0 computer program. For the statistical analysis, we first tested whether the variables to be statistically analysed were normally distributed using the K-S test for normality. The sample did not present a normal distribution of data as indicated by the analysis of the Kolmogorov-Smirnov test of normality in which all the variables evaluated followed a probability of less than or equal to 0.05. Therefore, for the analysis of the data, the non-parametric Mann-Whitney and Kruskal Wallis test was performed, which is the non-parametric test parallel to the t test for independent samples. Pearson's RHO Correlation Coefficient 'r' was used

to determine the relationship between different variables. The confidence level of .05 and .01 was taken into account for all statistical analyses. In addition, descriptive and frequency distribution (mainly means and standard deviations) and Chi-square independence tests were used.

Results

Mean scores of instruments

Table 2 shows the data for all the instruments used in this study. The mean scores on the FCV-19-S and STAI (S and T) were medium. The total PHQ-15 revealed low levels of somatization.

Table 2
Descriptive statistics in measures of questionnaires

Scales	M (SD)	Min	Max
FCV-19-S	16,20 (6,25)	7	35
STAI-S	7,30 (1,87)	2	15
STAI-T	7,22 (2.65)	1	15
PHQ-15	3,79 (3,90)	0	21
Emotions	N (%)		
Fear	14 (7)		
Anger	12 (6)		
Disgust	6 (3)		
Sadness	25 (12,6)		
Guilt	5 (2,5)		
Surprise	9 (4,5)		
Curiosity	20 (10,1)		
Admiration	2 (1)		
Security	19 (9,5)		
Joy	87 (43,7)		

Joy was the emotion that scored highest. Sadness was the second emotion with 12.6%.

Association of instruments and gender, age, year and emotions

We found significant gender-related differences in the PHQ-15 (Z:-2.793; p≤0.005), where females (mean range= 111.12) reported higher levels of somatization than males (mean range= 88.56).

Regarding age, we found two significant differences in the STAI-T (Z:-2,934; p≤0.003), whereby the older participants scored higher than their younger counterparts (mean range= 112.24 versus mean range= 88.44). On the PHQ-15 (Z:-3.578; p≤0.000), the older children showed higher levels of somatization compared to the younger participants (mean range= 115.01 versus mean range= 86.04).

By year, grouped together in educational stages, we found significant differences in the STAI-T ($\chi 2$ = 14,733; p≤0.001) with high mean ranges in baccalaureate (114.79), secondary school (111.03) and primary school (80.51); in the PHQ-15 ($\chi 2$ = 27.49623; p≤0.000) with high mean ranges in baccalaureate (136.16), in secondary school (106.15) and primary school (76.93); and in unpleasant emotions ($\chi 2$ = 8.895; p≤0.012), where frequency was higher in secondary education children (45.2%) than in primary (29%) and baccalaureate students (25.8%).

To analyse the emotions, we divided them into two groups, negative/unpleasant emotions (fear, anger, disgust, sadness and guilt) and positive/pleasant emotions (curiosity. admiration. security and joy). We found significant differences in the FCV-19-S (Z:-3.365; p≤0.001) (mean range= 114.77 versus mean range= 86.17). the STAI-T (Z:-3.143; p≤0.002) (mean range= 112.79 versus mean range= 86.31). the PHQ-15 (Z:-5.263; p≤0.000) (mean range= 124.70 versus mean range= 80.50) and age (Z:-2.624; p≤0.009) (mean range= 110.44 versus mean range= 88.26). In all cases. students with

unpleasant emotions scored higher than students with pleasant emotions on fear of COVID-19, trait anxiety and somatic symptoms. Furthermore, the older children reported more unpleasant emotions.

Correlations between instruments

Table 3 shows the correlations between the instruments used in this study.

Table 3

Correlations between instruments

	FCV-19-S	STAI-S	STAI-T	PHQ-15
FCV-19-S	1		.294**	.249**
STAI-S		1		-.142*
STAI-T			1	.240**
PHQ-15				1

Note. *p < .05; **p < .001.

Discussion

The COVID-19 epidemic is accelerating rapidly in multiple countries. Our findings in this current study shed light on the significant impact of the pandemic in the second wave of COVID-19 on the mental health of children and adolescents in an autonomous community of Spain.

Firstly, the mean scores obtained by our students on the total FCV-19-S (Martínez-Lorca et al., 2020), STAI (state and trait) (Buela-Casal, & Guillén-Riquelme, 2017) and PHQ-15 (Kroenke & Spitzer, 2002) are not exceptionally high. In fact, they can be considered medium-level or moderate in fear of COVID-19 and anxiety in both domains (state and trait). Moreover, the mean score on somatic symptoms of PHQ-15 was low and we can consider somatization to be only mild.

These results suggest the school students in our sample do not suffer from fear of COVID-19. Other studies, however, with samples of schoolchildren of the same mean age have found higher scores on fear of COVID-19, in, for example, Japanese school students, measured using the FCV-19-S (Masuyama et al., 2020). Additionally, Seçer & Ulaş (2020) and Gozpinar et al. (2021) found fear of COVID-19 in Turkish adolescents, measured using the FCV-19-S.

Our results also suggest the school students present neither anxiety nor somatic symptoms. With regard to anxiety, a number of studies have found anxiety in schoolchildren, caused by the current pandemic situation (Kılınçel et al., 2021; Liu, Liu & Liu, 2020; Nearchou et al., 2020; Seçer & Ulaş, 2020), although our participants' scores were intermediate on both the STAI-S and STAI-T. As for the presence of somatic symptoms, the literature has reported that somatic symptoms are common in children and adolescents with prevalence rates ranging approximately from 10% to 30%, and that these are closely related to mental and emotional symptoms (Cerutti et al., 2017). Some studies have evidenced the appearance of such symptoms as a result of the COVID-19 pandemic (Zhou et al., 2020), although the scores in our sample were very low, coinciding with Liu et al. (2020) and Jiao et al. (2020) who indicated that primary school students reported mild somatic symptoms.

Concerning emotions, strikingly, joy was the most commonly reported emotion among our sample, with 43.7% of the participants suggesting that joy had been the predominant emotion in the past seven days, followed, at a great distance, by sadness (12.6%). We are unable to find a reason for this, although arguably there was an

overestimation of joy, focused on an instantaneous emotion, and as a consequence of the feeling of happiness which might act as a psychological defence (Seligman, 2011) in response to the great stress and grief triggered by the pandemic, in such a way that joy, as a positive or pleasant emotion might be acting as a restraint against mental illness.

Sadness is an important emotion related to loss (Aguado 2014; 2015) and, during the COVID-19 lockdown in the first wave, its presence was arguably logical, but not now when the COVID-19 death is much lower. In fact, our students had to give up many habitual routines, habits, activities, and freedoms in the first wave of the COVID-19 pandemic. However, we are currently transitioning to a new normality.

Secondly, the relationships between the variables reveal some interesting findings. **By gender**, the girls present more somatic symptoms than the boys. Women in the general population typically exhibit greater comorbidity, with a presence of more physical and/or somatic problems and other related disorders, compared to men (Cano-Vindel, Salguero, Wood, Dongil, & Latorre, 2012; Hinz et al., 2017; Kroenke et al., 2010). This trend in replicated in the female students in our study sample in the second COVID-19 wave, who present higher levels of somatization. These results would indicate the early presence of a gender pattern, where females tend to suffer somatic symptoms or somatise. Thus, the prevention, identification and treatment of somatic symptoms in females should be included amongst the concerns and competences of education authorities because as girls appear to be a risk group in the COVID-19 crisis.

Regarding age, our outcomes found two significant differences in STAI-T and PHQ-15 across different age groups: the participants in the 12.49-18 years age group presented greater trait anxiety and higher levels of somatization compared to the younger children in the 8-12.48 year group.

Some authors (Cerutti et al., 2017) have suggested that somatic symptoms are common in school-aged children, with approximately 25% of children experiencing chronic or recurrent pain and chronic fatigue (e.g., headache, abdominal pain, and sore muscles). For some children, these symptoms are short-lived with no negative long-term impact on daily functioning or developmental course. However, the majority of these symptoms are associated with functional disability, emotional distress, requests for medical care and school absenteeism, fewer hobbies, impairment in daily life, leisure and sporting activities. Nonetheless, in our case it is the older boys and girls that present more somatic symptoms than their younger counterparts. This may be that the older individuals are, the less they allow themselves to express fear or sadness, which are then channelled psychosomatically (Lang, 1979). We are unable to justify this finding and thus future research is needed to confirm these results.

Anxiety follows the same pattern, with the older school students being those that exhibit higher levels of trait anxiety. Similar findings have been reported for older children in comparison to younger cohorts (Liu et al., 2020; Nearchou et al., 2020; Zhou et al., 2020), where anxiety was more present, although different instruments were used to measure its presence. It would thus be of interest to study why this occurs in the case of treat anxiety and not in state anxiety. State anxiety typically refers to subjective and transitory feelings of tension, apprehension, and fear, which can vary over time and fluctuate in intensity. State anxiety increases in response to various situations and occurrences and thus the scale assesses how a person feels in a specific stressful situation. Meanwhile, trait anxiety reflects a relatively stable emotional state and measures a person's general tendency to perceive day-to-day situations as threatening, as well as the person's baseline feelings. Trait anxiety and state anxiety are theoretically independent constructs (Spielberger, 1983). Our results, as a consequence of the emotional impact of the second wave COVID-19 pandemic in older school students, could be related to factors

such as their perception of the future, uncertainty and the potential negative impact on academic progress, poor academic performance, the future consequences of the pandemic in their lives, etc., with these factors possibly being on their personality baseline. Future works should address these questions to determine whether there exists a psychological and/or personality profile.

In any event, what is striking is that those young people aged between 12.49-18 years have a significantly increased likelihood of appearing in the high-risk group, in terms of reported psychological distress, anxiety and levels of somatization when compared to other age groups in our study sample. These results are of importance for the prevention of future problems in this age group, as not all these minors acquired the capacities to face the challenges of life, especially during the second wave of COVID-19. With regard to school year, again it is the older students, those in baccalaureate, followed by those in secondary education, that show higher levels of trait anxiety (STAI-T) and somatization (PHQ-15), being, as mentioned, in the 12.49-18 years age group.

The findings on emotions are interesting, as it is the secondary education students (aged from 12 to 16 years), who more prevalently report feeling unpleasant emotions (fear, anger, disgust, sadness and guilt) compared to those in primary education and baccalaureate. These emotions might beat at the root of many of the symptoms exhibited among the secondary school population in these pandemic times, and which are worthy of further research.

We found another important outcome related to emotions. Students reporting unpleasant emotions (fear, anger, disgust, sadness and guilt) scored higher than those reporting pleasant emotions on the FCV-19-S, STAI-T, PHQ-15 and were also older. Thus, students with an emotional style characterized by the presence of fear, anger, disgust, sadness and guilt present greater fear of COVID-19, greater trait anxiety, more somatic symptoms and are also older. It is as if maladaptive emotions were permanently activated, as there is a highly strong relationship between emotional rigidity (presenting the same emotion in repose to numerous stimuli) and psychosomatic illness (Aguado, 2014; 2015), placing these individuals in a situation of greater vulnerability and risk. Our findings therefore underline the need to implement detection and/or prevention interventions, through educational and emotion management programmes. In the same line, Decosimo et al. (2019) implemented a community psychosocial programme with the aim of improving the mental health capacity of children aged 3–18 years during the Ebola epidemic. The children received the interventions in settings where childhood trauma was prevalent. These interventions included expressive-art therapies, yoga therapy, and play therapy to help children to build healthy relationships, teach them child-specific trauma-coping skills, and build a safe space for children to express themselves. Consequently, it is key for schools to make proactive efforts to support the mental health and well-being of these students, as it seems they have fewer resources to adapt and are growing towards personal maturity.

Thirdly, the associations found between the instruments used in this study, despite not being significant, highlight that fear of COVID-19 measured on the FCV-19-S significantly predicted trait anxiety. Similar results have been found in children of the age of those in our study and in adolescents by (Gozpinar et al., 2021; Masuyama et al., 2020; Seçer & Ulaş, 2020), where fear of COVID-19 was directly related to anxiety, although again, in our case, this relationship is with trait anxiety. Fear of COVID-19 measure on the FCV-19-S also significantly predicted the total score on the PHQ-15, suggesting that fear of COVID-19 is associated with the presence of somatic symptoms. In this line, the STAI-T significantly predicted somatic symptoms on the PHQ-15. This situation is clinically understandable given that somatic symptoms are frequent in anxiety

disorders and vice versa and may be comorbid disorders (Hinz, et al., 2017; Kroenke et al., 2010; Lorca et al., 2021).

Our findings show an interesting negative association between the PHQ-15 and state anxiety. We are not aware of the reason for this disparity between the STAI-S and STAI-T. It is arguably related to our previous explanation with regard to trait anxiety and state anxiety being theoretically independent constructs (Spielberger, 1983); the participants in our study are young and not may not understand anxiety in the same way as adults. Further research is needed to clarify this issue.

On 21 October 2020, Spain became the first European country to report more than one million cases of Covid-19. In May 2020, it relaxed one of the world's longest lockdowns (Monge et al., 2021), but the country has struggled to contain outbreaks and in October the second wave of COVID-19 started. New measures were introduced, with restrictions on mobility between autonomous communities, curfews, reductions in the number of persons that can meet together, and the closure of leisure, culture and sporting facilities. Schools, however, remained open, with teaching continuing across all stages of education.

In conclusion, this research was motivated by the desire to ascertain the emotional, anxiety and mental health status of school students during the second wave of COVID-19. It was found that our 12- to 18-year old showed no fear of COVID-19, and no anxiety or symptomatic symptoms. The girls presented more somatic symptoms. The participants aged between 12.49 and 18 years presented greater trait anxiety and higher levels of somatization, compared with those aged between 8 and 12.48 years. The secondary school children reported the greatest prevalence of unpleasant emotions (fear, anger, disgust, sadness and guilt) compared to their counterparts in primary education and baccalaureate, suggesting they manage their emotions less effectively. Additionally, the unpleasant emotions were associated with fear of COVID-19, trait anxiety, somatization and age (the older boys and girls). Finally, we found a presence of psychological and/or psychiatric comorbidity, shown by the correlations between somatic symptoms and fear of COVID-19 and between fear of COVID-19 and trait anxiety. We also found a striking negative relationship between somatic symptoms and state anxiety.

Therefore, expanding research on strategies that are adaptable to individualized needs according to gender, age, and school year is fundamental to promote children's and adolescents' positive mental health status in the context of the COVID-19 pandemic. This study provides an insight into the associations between COVID-19-related emotional reactions and mental health outcomes in young people. For this reason, and also because their understanding requires a vast knowledge in many fields, they constitute an attractive topic for research.

This study had some limitations. First, the sample was made up of students from a geographically limited area of Spain and was not necessarily representative of the general Spanish population. Future studies using nationally representative samples and with students from different areas are needed to confirm the results reported herein. Second, these scores should be interpreted individually within the study context and not as aggregated findings. Third, the descriptive, cross-sectional nature of this research means it was not possible to establish causal relationships. It would be interesting for future research to conduct longitudinal studies

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