Original article

Analyzing protective factors for adolescents' mental health during COVID-19 pandemic in Spain: A longitudinal study

Analyse des facteurs de protection de la santé mentale des adolescents pendant la pandémie de COVID-19 en Espagne: une étude longitudinale

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ABSTRACT

Objective. – This study examined the protective role of self-esteem and perceived emotional intelligence on mental health problems in Spanish adolescents during COVID-19 pandemic.
Method. – Participants ($N = 139$; $M_{age} = 13.83$ years; $SD = 0.96$; 63.8% female) completed measures before the outbreak of COVID-19 (T1) and during the first wave of the pandemic in Spain (T2). Participants self-reported emotional intelligence, self-esteem, mental health problems and suicidal behavior.
Results. – Adolescent mental health problems were equally affected by COVID-19 pandemic according to gender, age and lockdown conditions. Adolescents with low levels of emotional intelligence and self-esteem at T1 showed a significant decrease in self-reported anxiety, depression, stress and suicidal behavior at T2. However, adolescents with average or high levels of emotional intelligence and self-esteem at T1 showed no significant changes in mental health problems at T2. Self-esteem at T1 meditated the relationships between emotional intelligence at T1 (clarity and repair) and emotional symptoms at T2 (depression, anxiety and stress). Furthermore, the relationship between self-esteem and anxiety symptoms was moderated by the number of people living together during COVID-19 lockdown.
Conclusion. – Our findings highlight the protective role of pre-pandemic development of self-esteem and emotional intelligence in mitigating the impact of COVID-19 outbreak on adolescent mental health during the pandemic.

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RÉSUMÉ

Objectif. – Cette étude a examiné le rôle protecteur de l'estime de soi et de l'intelligence émotionnelle perçue sur les problèmes de santé mentale chez les adolescents espagnols pendant la pandémie de COVID-19.
Conception. – Les participants ($N = 139$; $AM = 13,83$ ans; $ET = 0,96$; 63,8 % de femmes) ont rempli des formulaires avant l'apparition du COVID-19 (T1) et pendant la première vague de la pandémie en Espagne (T2).
Principales mesures des résultats. – Les participants ont auto-évalué l'intelligence émotionnelle, l'estime de soi, les problèmes de santé mentale et le comportement suicidaire.
Résultats. – Les problèmes de santé mentale des adolescents ont été affectés de manière égale par la pandémie de COVID-19 selon le sexe, l'âge et les conditions de confinement. Les adolescents ayant des niveaux faibles d'intelligence émotionnelle et d'estime de soi à T1 ont montré une diminution significative de l'anxiété, de la dépression, du stress et du comportement suicidaire autodéclarés à T2. Cependant, les adolescents ayant des niveaux moyens ou élevés d'intelligence émotionnelle et d'estime de soi à T1 n'ont

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montré aucun changement significatif des symptômes de santé mentale à T2. L'estime de soi à T1 a médié les relations entre l'intelligence émotionnelle à T1 (clarté et réparation) et les symptômes émotionnels à T2 (dépression, anxiété et stress). De plus, la relation entre l'estime de soi et les symptômes d'anxiété a été modérée par le nombre de personnes vivant ensemble lors du confinement de COVID-19.

Conclusion. – Nos résultats soulignent le rôle protecteur du développement pré-pandémique de l'estime de soi et de l'intelligence émotionnelle atténuant l'impact de l'épidémie de COVID-19 sur la santé mentale des adolescents pendant la pandémie.

Due to the rapid spread and severity of the coronavirus disease 2019 (COVID-19) the World Health Organization (WHO) concluded that COVID-19 qualifies as a pandemic on 11 March 2020 (World Health Organization, 2020). Many countries around the world imposed lockdown restrictions and other measures to deal with this health crisis by restricting the behavior and movements of the population, an experience without precedent for most people (Páez & Pérez, 2020). Spain was one of the most affected countries in Europe, especially during the first wave of COVID-19 (Legido-Quigley et al., 2020) and the situation has remained difficult due to recurrent waves of new variants and breakouts (García-Fernández et al., 2021).

Recent literature has suggested that the lockdown experience had a negative psychological impact on people's mental health, especially regarding depression, anxiety, and stress symptoms (Brooks et al., 2020; Lee, 2020; Wang et al., 2020) as well as suicidal behavior (Fortgang et al., 2021). Anxiety symptoms include psychophysiological activation or autonomic arousal (e.g., sweating, trembling, etc.) as well as the subjective feeling of insecurity and fear; depression symptoms refer to low positive affect including dysphoria, hopelessness, sadness or anhedonia; and stress relates to having difficulty relaxing, nervous agitation and easy excitability (Fonseca-Pedrero, Paino et al., 2010; Lovibond & Lovibond, 1995). Suicidal behavior was defined by the World Health Organization (2014) in terms of a set of behaviors that include suicidal ideation, suicide planning, suicide attempts and completed suicide. The prevalence of these mental health problems has increased during the ongoing pandemic, especially in children and adolescents (Newlove-Delgado et al., 2021).

Adolescents have been particularly vulnerable during the COVID-19 pandemic due to the social, emotional and physical changes that characterize this developmental stage (Gilchrist, 2017). The way adolescents cope with these additional challenges will shape their future behavior and relationship patterns as adults (Memmott-Elison et al., 2020). A study conducted with Spanish adolescents during COVID-19 lockdown revealed that 13.7% suffered from severe depression, 16.4% from severe anxiety and 13% from severe stress (Tamarit et al., 2020). In a recent study, suicidal attempts increased in adolescent girls during the last wave of the COVID-19 pandemic (Gracia et al., 2021). It is therefore necessary to identify the psychological mechanisms underlying the development of mental health problems in adolescents such as depression, anxiety, stress and suicidal behavior during a global crisis such as the ongoing COVID-19 pandemic.

Most investigations on the psychological impact of COVID-19 have focused on the analysis of risk factors for mental health (e.g., Chen et al., 2021; Horesh et al., 2020) using a cross-sectional design, however longitudinal studies that consider the role of protective factors are rare (Valero-Moreno et al., 2021). According to the theoretical framework of Positive Psychology, research should also address the psychological resources and strengths that promote well-being and improve mental health (Curran & Wexler, 2017; Seligman & Csikszentmihalyi, 2000). Personal and emotional strengths such as emotional intelligence and self-esteem have been associated with numerous benefits for adolescents and may be especially relevant during this global crisis. In fact, self-esteem (Rossi et al., 2020a) and emotional intelligence (Barros & Sacau-Fontenla, 2021; Extremera, 2020) have shown their relevance when mediating the negative impact of COVID-19 on mental health.

Theoretical models of emotional intelligence have traditionally fallen into two categories: trait models and ability models (Mayer et al., 2000). Trait models understand emotional intelligence as a set of behavioral dispositions and self-perceptions about one's ability to recognize, process and use emotional information (Petrides et al., 2004). Ability models emphasize the adaptive use of emotions, understanding them to facilitate an effective reasoning (Mayer et al., 2008). Mayer and Salovey's (1997) ability model of emotional intelligence is theoretically sound and has the most empirical support (Joseph & Newman, 2010; Mayer et al., 2000).

According to the ability approach, emotional intelligence has been defined as a set of abilities or skills to perceive one's own emotions and those of others, to discriminate between them and to use emotional information to guide action and thought (Mayer & Salovey, 1997). The Trait Meta-Mood Scale (TMMS; Salovey et al., 1995) is one of the most widely used self-reports based on Mayer and Salovey's ability model (Mayer & Salovey, 1997; Mayer et al., 2016), which assess perceived emotional intelligence (Extremera & Fernández-Berrocal, 2005). Perceived emotional intelligence refers to the knowledge that people have about their own emotional abilities (Salovey et al., 2002). The instrument assesses three dimensions: attention to feelings, mood clarity and emotional repair, which can be addressed separately (Hodzic et al., 2016). For instance, clarity and repair were negatively related to symptoms of depression and anxiety as well as suicidal behavior, while the relationship between attention and mental health problems was positive (Domínguez-García & Fernández-Berrocal, 2018; Salguero et al., 2012). Similarly, adolescents with enhanced clarity and repair showed less perceived stress (Extremera et al., 2009), however, adolescents with high levels of attention presented higher levels of perceived and physiological stress (Ciarrochi et al., 2002; Villanueva et al., 2017). Previous studies have shown that self-esteem may be a mediator of the relationship between emotional intelligence and the cognitive dimension of subjective well-being (Kong et al., 2012). However, little is known about the mediating role in the relationship between emotional intelligence and mental health problems. The way in which emotional intelligence might influence self-esteem may be understood according to the theory of self-perception. In this theory, self-esteem is built on a person's perception of his or her ability and performance (Zeidner et al., 2009). If the person has an adequate ability to perceive, understand and regulate emotions, he/she is likely to develop a favorable attitude of him/herself. In this way, emotional intelligence would lead to higher levels of self-esteem.

During the COVID-19 pandemic, studies on emotional intelligence and mental health problems have been conducted in different populations. A study with adolescent caregivers showed

that emotional regulation was a key predictor for mental health outcomes. Specifically, caregivers who were able to positively reappraise emotional situations experienced fewer somatic complaints and higher life satisfaction (Lacomba-Trejo et al., 2021). Furthermore, emotional intelligence was identified as a protective factor for emerging adults' mental health even during an unprecedented crisis such as the COVID-19 pandemic. A longitudinal study conducted by Persich et al. (2021) revealed that high levels of emotional intelligence before the pandemic reduced the likelihood of developing mental health problems later on. The participants of the study who participated in a pre-pandemic emotional skill-training presented lower levels of depression, suicidal ideation and state anxiety measured during the COVID-19 pandemic. In college students, emotional intelligence appeared to mediate the relationship between pandemic exposure and psychological disorders (Li et al., 2021). Other studies that have been conducted with adults also revealed the protective role of emotional intelligence during the COVID-19 pandemic, indicating that emotional abilities were associated with experiencing unpleasant emotions (such as sadness, fear and anxiety) with less intensity, but not less frequently (Moroń & Biolik-Moroń, 2021). Moreover, emotional intelligence was inversely related to worries about the COVID-19 pandemic in adults (Zysberg & Zisberg, 2022). Evidentially, it is necessary to examine whether emotional intelligence is also a relevant factor during the COVID-19 pandemic for adolescents' mental health.

The study of self-esteem has been approached mainly from two different perspectives: multidimensional and unidimensional. From the first perspective, self-esteem has been understood as a construct with multiple components that are organized in a hierarchical manner. According to the second perspective, the existence of a global self-esteem has been emphasized (Marsh et al., 2006). Self-esteem has been mainly assessed through self-report measures and the most widely used is the Rosenberg self-esteem scale, which follows the unidimensional perspective (Orth et al., 2018). In line with the unidimensional approach, self-esteem has been defined as the individual overall evaluation of personal value and self-worth (Rosenberg, 1965; Smith et al., 2014). On the one hand, previous studies have suggested that adolescents' self-esteem was related to mental health problems, i.e. adolescents with a high self-esteem showed fewer symptoms of anxiety and depression (Guo et al., 2018; Orth et al., 2012), coped better with stressful events (Kocayörük & Şimşek, 2015; Thompson et al., 2016) and experienced less stress (Pierkarska, 2020). In Beck's cognitive model of depression (Beck, 1967), one of the dimensions of the cognitive triad of depression is a negative view of oneself (along with a negative view of the world and the future). This cognitive schema with negative content contributes to further cognitive distortions that lead to altered information processing that manifests itself in depression. Therefore, a negative attitude of oneself may lead to distorted information processing that is reflected in increased depressive symptoms. Similarly, Clark and Beck's (2010) cognitive model of anxiety posits that cognition plays an important role in anxiety, especially in relation to the self. If beliefs are negative (e.g., "Nobody likes me"), this contributes to the occurrence of anxiety symptoms. In line with the transactional model of Lazarus and Folkman (1984), people will experience stress when they feel that the demands of the situation exceed the available personal resources and well-being is endangered. If the person has a positive attitude towards him/herself and feels able to cope with the demands of the environment, he/she will experience lower levels of stress. The above-mentioned models explain how self-esteem influences the occurrence of symptoms of depression, anxiety and stress. On the other hand, adolescents with low self-esteem were more likely to engage in parasuicidal behavior (cutting themselves, physical self-harm), suicidal ideation or attempts (Soto-Sanz et al., 2019). In this sense, the vulnerability-stress model (Anseán, 2014)

suggests that there is a predisposition (vulnerability) which, combined with environmental factors, may or may not lead to the appearance of suicidal behavior depending on the nature of these factors (risk or protective). Therefore, having a favorable attitude towards oneself would be a personal factor that influences the vulnerability of the person (predisposition) and reduces the probability of suicidal behavior.

Most studies examined the impact of COVID-19 on self-esteem in general (Alsawalqa, 2021; Pizarro-Ruiz & Ordóñez-Camblor, 2021; Vall-Roqué et al., 2021), but few analyzed the protective role of self-esteem for adolescents' mental health during the pandemic. There is some evidence to suggest that self-esteem was positively associated with mental health and well-being in adults. In a recent study conducted with 1200 adults, Rossi et al., 2020a found that self-esteem mediated the relationship between two risk factors (fear of COVID-19 and dispositional loneliness feelings) and mental health outcomes such as anxiety and stress symptoms. This study showed the mediating role of self-esteem in adult population and suggested that it might also be the case in adolescence. During the COVID-19 lockdown, self-esteem was a protective factor for social isolation in adolescents (Preston & Rew, 2022). However, more research is needed to determine the underlying mechanism that may explain the relationship between individual differences in emotional competence and mental health problems during the COVID-19 pandemic.

In addition to personal and emotional variables, external conditions related to the lockdown situation may have a relevant influence on mental health problems. For instance, the frequency leaving the house during lockdown (Aloi et al., 2020), household size and the number of people living together (Okabe-Miyamoto et al., 2021) have been identified as relevant stressors that might increase mental health problems (Moya-Lacasa et al., 2021). These recent studies also have shown that people were relying more on their household members to fulfill their social and emotional needs during lockdown and social distancing interventions, thus, living with a partner appeared to confer unique benefits for people's psychological health (Okabe-Miyamoto et al., 2021). It seems reasonable to expect that these lockdown conditions would moderate the influence of individual difference in emotional intelligence on adolescents' mental health problems. Based on the previous literature, we would expect that individual living in more disadvantaged lockdown conditions (not being able to leave the house, small household size and many people living together) would benefit less from their emotional intelligence and experience greater emotional instability (Persich et al., 2021).

1. The current study

Although other longitudinal studies have examined the psychological impact of the COVID-19 pandemic in adolescent population, only one of these previous investigations compared these effects with pre-pandemic measures. Most research involving adolescents have been launched once the pandemic has already started and public health restrictions, such as lockdown and social distancing measures, have been imposed (e.g., Fortgang et al., 2021; Orgilés et al., 2022). Some studies have analyzed the psychological distress during the COVID-19 pandemic with longitudinal data form before and after the outbreak in the United States (US), but only in adult population (e.g., Breslau et al., 2021; Yang et al., 2021). To the best of our knowledge, there is one study, which has examined the impact of COVID-19 on mental health problems in a longitudinal sample of 24 adolescents observing a large increase in depressive and anxiety symptoms in participants who were healthy prior to the pandemic (Cohen et al., 2021). This study focused on the influence of attachment with peers and family, but did not examine the influence of

other protective factors such as self-esteem and perceived emotional intelligence. Therefore, the present study aims to fill this gap in the literature and provided data on adolescents collected before the pandemic (T1) and during the first wave of the COVID-19 pandemic (T2), including variables on mental health problems and personal and emotional strengths.

Previous studies suggest that emotional intelligence may be influencing self-esteem and self-esteem in turn may be influencing the occurrence of mental health problems. The ability to perceive, understand and regulate emotions could determine a person's view of him or herself (Zeidner et al., 2009). If someone has adequate emotional intelligence, he/she is likely to develop a positive attitude of him/herself (high self-esteem); whereas, if he/she feels emotionally incompetent, he/she will develop a negative attitude of him/herself (low self-esteem). According to cognitive models of depression and anxiety (Beck, 1967; Clark & Beck, 2010), a negative view of oneself might influence the emergence of affective symptomatology. In this sense, a cognitive schema with negative content (negative self-view) will contribute to someone presenting more cognitive distortions. This will lead to altered information processing and will be manifested by the appearance of symptoms of depression and anxiety. Similarly, if someone has a positive view of him/herself and feels able to cope with the demands of the environment, he/she will experience lower levels of stress (Lazarus & Folkman, 1984). Finally, in line with the vulnerability-stress model, having a positive view of oneself would be a personal factor that influences a person's vulnerability (predisposition) and decreases the likelihood of suicidal behavior (Anseán, 2014).

Therefore, the present study examined the impact of perceived emotional intelligence and self-esteem on mental health problems in Spanish adolescents during COVID-19 pandemic. Regarding our hypotheses, we excepted to find: (H1) adolescents with high emotional intelligence (low-medium attention, high clarity, and high repair) and self-esteem at T1 would have lower levels of emotional symptomatology (depression, anxiety, and stress) and suicidal behavior during COVID-19 lockdown (T2); (H2) self-esteem at T1 would mediate the relationship between emotional intelligence at T1 and mental health problems (symptoms of depression, anxiety and stress, and suicidal behavior) at T2; and (H3) the COVID-19 pandemic-related variables (number of people living together, housing characteristics and frequency of going outside) would moderate the relationship between self-esteem at T1 and mental health problems at T2.

2. Material and methods

2.1. Setting and design

The present study was part of a larger research project designed to evaluate and implement a social-emotional learning program for adolescents. Data were collected prior to the launch of the program, which was scheduled for the beginning of the 2020 semester. We used a 2-wave longitudinal design (before the global pandemic November 2019–February 2020 = T1; end of hard lockdown May–June 2020 = T2), with 4–6 months between both assessments. All sociodemographic and psychological variables were measured in the first and second wave (T1 and T2), while the COVID-19 related variables were only assessed in the second wave (T2).

The data collection at T2 took place during the first wave of the COVID-19 in Spain, which was one of the most affected countries by the COVID-19 outbreak in Europe with a continuous increase in confirmed cases and deaths (1484 confirmed daily cases and 236 daily deaths when the data collection at T2 started) (WHO, 2021). As a result, the Spanish government had adapted several measures in response to the rapid spread of the coronavirus, which included

closures of schools, universities and non-essential shops, cancelations of public events, restrictions of mobility and total confinement of the population. According to the Oxford COVID-19 Government Response Tracker, the government response in Spain during data collection at T2 corresponded to a lockdown stringency index of 81.94 (index ranges between 1–100), which indicates a very strict lockdown (Hale et al., 2021).

The sampling method was a non-probabilistic convenience sampling method. Before the pandemic (T1), data from 647 adolescents have been collected, of whom 14 were excluded because they did not meet the inclusion criteria. A total of 138 participants who incorrectly answered more than 25% of the Oviedo Infrequency Scale were removed from the study. Of the remaining 495 adolescents, 168 completed the survey on sociodemographic and psychological variables. These 168 adolescents were asked to respond to a second survey about their experience during the COVID-19 pandemic, which 139 completed successfully.

2.2. Participants

The present study comprised 139 adolescents aged between 12 and 16 years (M = 13.83 years, SD = 0.96), who were attending from 7th to 10th grade of secondary school. Most of the participants were female (n = 80, 63.8%) and of Spanish nationality (n = 123, 89.1%). Regarding the conditions during the hard lockdown in Spain (Table 1), the majority of participants reported living either in an apartment with (74.1%) or without (15.1%) outside zones (balcony, courtyard, etc.) and sharing the space with an average number of 3.90 relatives (range between 2 and 9). At the time the study was conducted, many participants stayed at home during the lockdown (42.5%), and only a minority went outside (for shopping, doing exercise, spending time with friends, etc.) on a regular basis (16.6% once a week; 6.5% 2/3 times a week; 2.9% almost every day). In terms of personal of family impact of the coronavirus, 5.0% of participants have had relatives testing positive of COVID-19, and 8.6% have had someone from their families pass away because of the disease. In addition, 6.5% and 12.2% of participants tested positive of COVID-19 or experienced symptoms.

2.3. Procedure

The present research was approved by the Ethics Commission of the University of Valencia and the data were collected according to the standards of the Declaration of Helsinki (World Medical Association, 2013). Informed consent was signed by parents or legal guardian of the participants and by the adolescents themselves. All participants were informed of the purpose of the study, the voluntary nature of their participation, the confidentiality and the anonymity of their responses. Data were collected through an online questionnaire on Limesurvey accessible from any electronic device (smartphone, tablet, laptop, etc.). The assessment at T1 and T2 lasted approximately 50 minutes each.

The inclusion criteria were: (1) aged between 12 and 16 years; (2) complete responses in both assessments T1 and T2; and (3) having spent the COVID-19 health crisis and lockdown in Spain. Furthermore, participants who incorrectly answered more than 25% of the Oviedo Infrequency Scale (Fonseca-Pedrero, Wells et al., 2010), which detects careless responding, were removed from the study.

2.4. Instruments

Self-report measures, adapted and validated for Spanish adolescents were used in this study. The reliability values Cronbach's α and McDonald's ω, are based on the sample from this study at T1 and T2.

Table 1
Participants' demographic characteristics. COVID-19 lockdown conditions and its impact.

	n (%)	M (SD)
Demographics		
Gender		
Men	50 (36.23)	
Women	80 (63.77)	
Age (range = 12 to 16 years old)		13.83 (0.96)
Participants aged between 12 years old	12 (8.63)	
Participants aged between 13 years old	34 (24.46)	
Participants aged between 14 years old	64 (46.04)	
Participants aged between 15 years old	21 (15.11)	
Participants aged between 16 years old	7 (5.04)	
Grade (range = 7th to 10th grade of high school)		
Participants in 7th grade	18 (13.04)	
Participants in 8th grade	35 (25.36)	
Participants in 9th grade	69 (50.00)	
Participants in 10th grade	16 (11.59)	
Nationality		
Spain	123 (89.13)	
Other countries	15 (10.87)	
COVID-19 lockdown conditions		
Number of people living together (range = 2 to 9)		3.90 (0.98)
Housing characteristics		
Flat or apartment without outside zones (balcony, courtyard, etc.)	21 (15.11)	
Flat or apartment with outside zones (balcony, courtyard, etc.)	103 (74.10)	
House with outside zones (e.g., garden)	9 (6.47)	
House with large outside zones (e.g., a chalet in a mountain area)	5 (3.60)	
Frequency of going outside (for shopping, doing exercise, meeting friends, etc.)		
I have not going out since the beginning of the lockdown	59 (42.45)	
Less than 1 time per week	44 (31.65)	
Once a week	23 (16.55)	
Two or three times a week	9 (6.47)	
Almost every day	4 (2.88)	
Impact of COVID-19		
Has someone from your family died of COVID-19?		
No	127 (91.37)	
Yes	12 (8.63)	
Has someone from your family had symptoms of COVID-19 or tested positive?		
No	144 (82.01)	
Has had symptoms but has not been tested	7 (5.04)	
I do not know	18 (12.95)	
Have you had symptoms of COVID-19 or tested positive?		
No	105 (75.54)	
I had symptoms but have not been tested	9 (6.47)	
I have tested positive of COVID-19	17 (12.23)	
I do not know	8 (5.76)	

2.4.1. Participants' characteristics

Participants were asked about basic demographic information (gender, age and school grade), conditions in which the lockdown took place (household size and housing characteristics, and the frequency of going outside during lockdown), and personal/family impact of coronavirus (whether participants or family members experienced symptoms, tested positive or died of COVID-19).

2.4.2. Perceived emotional intelligence

The Spanish version of the Trait Meta-Mood Scale-24 (TMMS-24; Fernández-Berrocal et al., 2004; Pedrosa et al., 2014; Salovey et al., 1995) was used. The instrument consists of 24 items divided into three factors (attention, clarity and repair) and a 5-point Likert response scale (1 = strongly disagree to 5 = strongly agree). Attention is the ability to pay attention and express feelings appropriately (e.g., "I think it is worth paying attention to your own emotions or moods"), clarity refers to understanding of emotional mood states (e.g., "I often perceive my feelings clearly"), and repair is the appropriate emotional regulation (e.g., "Although I am sometimes sad, I generally have an optimistic viewpoint"). The results showed that the Cronbach's alpha and McDonald's omega were found to be satisfactory in the present sample: Attention ω_{T1} = .89, α_{T1} = .89, ω_{T2} = .88, α_{T2} = .87; Clarity ω_{T1} = .86, α_{T1} = .85, ω_{T2} = .93, α_{T2} = .92; and Repair ω_{T1} = .86, α_{T1} = .86, ω_{T2} = .85, α_{T2} = .84.

2.4.3. Self-esteem

The Rosenberg Self-esteem Scale (RSE; Atienza et al., 2000; Rosenberg, 1965) was used. This instrument consists of 10 items and a 4-point Likert response scale (1 = strongly disagree to 4 = strongly agree). The self-esteem scale measures the individual overall evaluation of personal value and self-worth (e.g., "I feel that I have a number of good qualities"). This scale showed good reliability indexes in the study's sample (ω_{T1} = .85, α_{T1} = .86, ω_{T2} = .89, α_{T2} = .89).

2.4.4. Depression, anxiety and stress symptoms

The Depression, Anxiety and Stress Scales (DASS-21; Daza et al., 2002; Lovibond & Lovibond, 1995) was used. The scale consists of 21 items with a 4-point Likert response scale (0 = never, 3 = almost always) and assess depression, anxiety and stress symptoms during the previous week. The depression scale measures dysphoria, hopelessness, devaluation of life, lack of interest/involvement and anhedonia (e.g., "I couldn't seem to experience any positive feeling at all"). The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect (e.g., "I was aware of dryness of my mouth"). The stress scale evaluates having difficulty relaxing, nervous arousal, and being easily agitated (e.g., "I felt that I was using a lot of nervous energy"). In our study, Cronbach's alpha and McDonald's omega

for the three subscales were satisfactory: Depression ω_{T1} =.88, α_{T1} =.88, ω_{T2} =.86, α_{T2} =.88; Anxiety ω_{T1} =.79, α_{T1} =.78, ω_{T2} =.81, α_{T2} =.80; and Stress ω_{T1} =.77, α_{T1} =.77, ω_{T2} =.76, α_{T2} =.75.

2.4.5. Suicidal behavior

The Adolescent Suicidal Behavior Assessment Scale (SEN-TIA – Brief; Díez-Gómez et al., 2020, 2021) was used. This short version of the original SENTIA scale consists of 5 items with dichotomous response format (*yes/no*). The scale evaluates a set of different suicidal behaviors in adolescence, which include suicidal ideation, planning, communication and acts (e.g., "Have you ever wished you were dead?"; "Have you ever tried to take your life?"). In the present study, the reliability of the SENTIA-Brief was appropriate (ω_{T1} =.82, α_{T1} =.80, ω_{T2} =.77, α_{T2} =.76).

2.5. Data analysis

Before testing our hypotheses, preliminary analyses have been performed. First, descriptive statistics (i.e., means and percentages) were estimated to characterize participants in terms of basic socio-demographic information at T1, as well as COVID-19 lockdown conditions and impact of COVID-19 at T2. Second, multivariate ANOVAs were conducted to test for differences in mental health problems at T2, controlling for T1 values, related to demographic variables (gender and age) at T1 and COVID-19 related variables at T2: housing, number of people living together, frequency of going outside, having been tested positive for COVID-19 oneself or a family member, death of a family member due to COVID-19. In addition, Pearson's bivariate correlation analyses were performed between all observed variables at T1 and T2.

To test our first hypothesis, repeated-measures ANOVA (GLM) were conducted for mental health problems in order to analyze the effect of longitudinal measures and the interaction with levels of perceived emotional intelligence and self-esteem at T1. For that purpose, participants were assigned to pre-established categories (low, average, high) based on their scores on each dimension of emotional intelligence (attention, clarity and repair) as well as self-esteem at T1 according to the cut-off scores provided by the Spanish validation of the TMMS-24 (Fernández-Berrocal et al., 1998) and RSE (Rosenberg, 1965) respectively. Specifically, in perceived emotional intelligence: low attention (girls: $\leq$ 24, boys: $\leq$ 21), average attention (girls: 25–35, boys: 22–32) and high attention (girls: $\geq$ 36, boys: $\geq$ 33); low clarity (girls: $\leq$ 23, boys: $\leq$ 25), average clarity (girls: 24–34, boys: 26–35) and high clarity (girls: $\geq$ 35, boys: $\geq$ 36); and low repair (girls: $\leq$ 23, boys: $\leq$ 23), average repair (girls: 24–34, boys: 24–35) and high repair (girls: $\geq$ 35, boys: $\geq$ 36). In self-esteem, low levels were defined as scores of 25 or below, intermediate levels for scores between 26 and 29, and high levels for scores of 20 or above. In case that mean differences between group levels of emotional intelligence and self-esteem at T1 shown statistical significance (p < .05), Tukey's honest significant difference (HSD) tests were conducted to determine which levels significantly differed from each other. Power analysis were carried out using G*Power 3.1.9.7 (Faul et al., 2007).

To test our second hypothesis, The Hayes (2017) PROCESS macro was used to analyze the mediating role of self-esteem in the relationship between perceived emotional intelligence (T1) and mental health problems (T2), controlling for gender, age and mental health problems at T1 (covariates). The mediating model (model 4) was tested with mean-centered variables, heteroscedasticity-consistent standard errors and 10.000 bootstrap resamples with 95% bias-corrected confidence intervals for the indirect effect. For those models that showed significant mediations, moderated mediations (model 15) were performed to evaluate the third hypothesis, that is, whether COVID-19 related variables moderated the

relationship between emotional intelligence, self-esteem and mental health problems.

Finally, Cronbach's alpha and McDonald's omega were examined for the reliability of all measurement instruments at T1 and T2. All analyses of the present study were run using IBM SPSS Statistics 26.0 and JASP 0.9.2.

3. Results

3.1. Descriptive statistics and demographic analyses

Descriptive statistics are provided in Table 2. Results from multivariate ANOVAs for the demographic variables indicated neither statistically significant age differences in mental health problems at T2 (Wilks's Lambda, L = .83, F [16,382] = 1.54, p = .08, η^2 = .05) nor for gender (Wilks's Lambda, L = .96, F (4,1280) = 1.34, p = .26, η^2 = .04), controlling the effect of T1 values.

Regarding COVID-19 lockdown conditions, participants showed any significant differences in mental health symptoms at T2, controlling the effect of T1 values, when comparing their housing characteristics [Wilks's Lambda, L = .88, F (12,336) = 1.42, p = .16, η^2 = .04], comparing how many people they were living together with [Wilks's Lambda, L = .77, F (24,430) = 1.38, p = .11, η^2 = .06) nor how often their went outside [Wilks's Lambda, L = .91, F (12,333) = 0.99, p = .46, η^2 = .03]. In addition, variables related to personal/family impact of coronavirus did not shown significant differences in the outcome variables at T2, controlling the effect of T1 values: have been tested positive for COVID-19 [Wilks's Lambda, L = .94, F (12,333) = .61, p = .83, η^2 = .02]; a family member has been tested positive for COVID-19 [Wilks's Lambda, L = .95, F (8,254) = .77, p = .63, η^2 = .02]; death of a family member [Wilks's Lambda, L = .99, F (4,128) = .17, p = .95, η^2 = .01].

3.2. Correlation analyses

Table 2 shows Pearson's correlations between all measure at T1 in the upper half of the table and at T2 in the lower half on the table. Descriptors for the magnitude of the correlations are based on Cohen (1988). At the first moment of assessment (T1), emotional abilities (clarity and repair) correlated positively with self-esteem (r between .20 and .49, p < .05) and negatively with depression, stress, suicide behavior and negative affect (r between −.21 and −.33, p < .01), showing small to moderate effect sizes. However, moderate to large correlations were observed between self-esteem and mental health problems. Thus, self-esteem was associated negatively with depression, anxiety, stress (r between −.36 and −.64, p < .01). The correlations between emotional symptoms (depression, anxiety and stress) and suicide behavior were positive (r between .26 and .51, p < .01), observing moderate to large effect sizes. Correlations at the second moment of assessment during the COVID-19 lockdown (T2) were very similar in magnitude to those at T1.

3.3. Repeated-measures ANOVA (GLM)

The means and standard deviations of mental health problems measured at T1 and T2 for three different levels of emotional intelligence and self-esteem (low, average, high) at T1 are presented in Table 3, with differences in the score of anxiety, depression, stress and suicidal behavior at both assessments.

3.3.1. Attention T1

Results from repeated-measures linear model (GLM) showed a significant change between the two assessments (T1 and T2) of anxiety across attention levels ($F_{(1)}$ = 8.55, p < .01). There was also a significant interaction with the two time measurements ($F_{(2)}$ = 3.96,

Table 2
Descriptive statistics and Pearson's correlations between included measures at T1 and T2.

	T1 Range	T1 M (SD)	T2 Range	T2 M (SD)	1	2	3	4	5	6	7	8
Perceived emotional intelligence (TMMS)												
1. Attention	8–40	24.19 (7.34)	9–40	23.05 (6.18)	1	.30**	.14	−.11	.13	.09	.05	−.04
2. Clarity	8–39	24.30 (6.82)	11–40	23.22 (6.97)	.50**	1	.31**	.20**	−.10	−.05	.09	−.09
3. Repair	12–40	26.86 (6.82)	11–40	26.17 (6.29)	.26**	.38**	1	.49**	−.33**	−.17	−.21**	−.21**
Self-esteem (RSE)												
4. Total score	14–40	29.24 (5.79)	15–40	29.47 (5.79)	.08	.40**	.50**	1	−.64**	−.38**	−.36**	−.46**
Depression, anxiety, and stress (DASS-21)												
5. Depression	0–42	11.65 (10.04)	0–42	11.76 (10.38)	−.05	−.28**	−.32**	−.67**	1	.67**	.54**	.51**
6. Anxiety	0–42	12.33 (9.10)	0–38	10.83 (8.96)	.01	−.20*	−.20*	−.50**	.68**	1	.68**	.32**
7. Stress	0–40	17.94 (8.83)	0–40	17.87 (8.77)	−.02	−.10	−.10	−.44**	.67**	.72**	1	.26**
Suicidal behavior (SENTIA)												
8. Total score	0–5	0.69 (1.22)	0–4	0.61 (1.13)	−.13	−.15	−.37**	−.47**	.41**	.31**	.24**	1

Note. T1: first wave (upper half of the table); T2: second wave (lower half of the table). *p < .05. **p < .01. ***p < .001.

Table 3
Means. SDs. Effect sizes. Statistical power. Analysis of variance for mental health symptoms.

	Depression T1 M (SD)	Depression T2 M (SD)	Anxiety T1 M (SD)	Anxiety T2 M (SD)	Stress T1 M (SD)	Stress T2 M (SD)	Suicide behaviour T1 M (SD)	Suicide behaviour T2 M (SD)
Attention T1								
Low	10.27 (9.23)	11.29 (10.09)	11.24 (8.49)	9.95 (8.16)	17.24 (8.40)	17.32 (8.06)	0.67 (1.18)	0.56 (1.07)
Average	12.51 (10.52)	13.20 (11.18)	12.40 (9.37)	12.60 (10.95)	17.89 (9.14)	18.66 (10.40)	0.61 (1.23)	0.60 (1.11)
High	15.38 (13.46)	9.38 (11.15)	16.92 (10.54)	8.77 (7.46)	22.00 (9.49)	17.38 (10.66)	1.08 (1.75)	0.92 (1.75)
ANOVA								
Time	$F_{(1)} = 1.38$	$p = .24$	$F_{(1)} = 8.55$	$p = .004$	$F_{(1)} = 1.34$	$p = .25$	$F_{(1)} = 0.58$	$p = .45$
Level	$F_{(2)} = 2.20$	$p = .11$	$F_{(2)} = 3.96$	$p = .02$	$F_{(2)} = 1.56$	$p = .21$	$F_{(2)} = 0.17$	$p = .84$
Interaction	$F_{(2)} = 1.10$	$p = .33$	$F_{(2)} = 1.31$	$p = .27$	$F_{(2)} = 0.73$	$p = .48$	$F_{(2)} = 0.80$	$p = .45$
$\eta2_p$ (1-∝)	.030	(.062)	.055	(.092)	.026	(.059)	.002	(.050)
Clarity T1								
Low	12.80 (9.98)	13.06 (10.40)	12.92 (9.33)	11.83 (9.26)	18.24 (7.62)	18.77 (8.85)	0.83 (1.38)	0.65 (1.21)
Average	10.47 (9.86)	11.00 (11.16)	11.50 (8.57)	10.17 (9.98)	17.22 (9.67)	16.44 (9.85)	0.57 (1.15)	0.57 (1.09)
High	10.20 (14.09)	9.60 (8.53)	11.00 (11.32)	9.80 (7.02)	19.80 (12.09)	21.00 (7.73)	0.20 (0.42)	0.50 (1.08)
ANOVA								
Time	$F_{(1)} = 0.01$	$p = .96$	$F_{(1)} = 1.02$	$p = .31$	$F_{(1)} = 0.07$	$p = .79$	$F_{(1)} = 0.09$	$p = .76$
Level	$F_{(2)} = 0.04$	$p = .96$	$F_{(2)} = 0.01$	$p = .98$	$F_{(2)} = 0.39$	$p = .67$	$F_{(2)} = 1.08$	$p = .34$
Interaction	$F_{(2)} = 1.47$	$p = .23$	$F_{(2)} = 0.87$	$p = .42$	$F_{(2)} = 1.56$	$p = .21$	$F_{(2)} = 0.91$	$p = .40$
$\eta2_p$ (1-∝)	.002	(.050)	.001	(.050)	.008	(.051)	.012	(.052)
Repair								
Low	15.92 (10.76)	15.55 (11.69)	13.77 (9.62)	11.81 (9.88)	20.75 (7.76)	20.00 (8.72)	1.13 (1.51)	1.00 (1.43)
Average	10.35 (9.75)	11.25 (10.03)	11.82 (9.34)	11.19 (9.59)	16.84 (9.49)	17.49 (9.75)	0.45 (1.00)	0.44 (0.98)
High	6.29 (6.27)	5.90 (6.85)	9.71 (5.74)	8.00 (7.40)	15.24 (6.65)	14.29 (7.49)	0.52 (1.25)	0.33 (0.73)
ANOVA								
Time	$F_{(1)} = 0.01$	$p = .96$	$F_{(1)} = 2.37$	$p = .13$	$F_{(1)} = 0.14$	$p = .71$	$F_{(1)} = 1.13$	$p = .29$
Level	$F_{(2)} = 0.25$	$p = .77$	$F_{(2)} = 0.32$	$p = .73$	$F_{(2)} = 0.43$	$p = .65$	$F_{(2)} = 0.32$	$p = .72$
Interaction	$F_{(2)} = 11.89$	$p < .001$	$F_{(2)} = 1.94$	$p = .14$	$F_{(2)} = 5.43$	$p = .005$	$F_{(2)} = 6.68$	$p = .002$
$\eta2_p$ (1-∝)	.002	(.050)	.005	(.050)	.005	(.050)	.015	(.053)
Self-esteem								
Low	20.57 (9.90)	17.29 (11.88)	16.81 (9.90)	15.81 (10.66)	21.43 (8.04)	21.29 (9.55)	1.62 (1.62)	1.24 (1.57)
Average	14.37 (8.52)	16.68 (8.74)	14.95 (8.65)	12.37 (8.25)	20.26 (9.15)	21.68 (6.83)	0.61 (1.08)	0.71 (1.09)
High	5.86 (6.89)	7.13 (8.38)	8.64 (7.39)	8.11 (8.26)	15.08 (8.42)	14.53 (9.11)	0.24 (0.78)	0.29 (0.76)
ANOVA								
Time	$F_{(1)} = 0.01$	$p = .92$	$F_{(1)} = 2.73$	$p = .10$	$F_{(1)} = 0.08$	$p = .77$	$F_{(1)} = 0.67$	$p = .42$
Level	$F_{(2)} = 3.06$	$p = .05$	$F_{(2)} = 0.56$	$p = .57$	$F_{(2)} = 0.51$	$p = .60$	$F_{(2)} = 2.45$	$p = .09$
Interaction	$F_{(2)} = 55.65$	$p < .001$	$F_{(2)} = 10.06$	$p < .001$	$F_{(2)} = 17.32$	$p < .001$	$F_{(2)} = 21.53$	$p < .001$
$\eta2_p$ (1-∝)	.024	(.058)	.007	(.051)	.008	(.051)	.064	(.109)

Note. N: 163; M: mean; SD: standard derivation; F: F ratio; p: probability; T1: first wave; T2: second wave; η2_p: partial eta squared (size effect); 1-∝: statistical power.

$p = 02$), but not for the effect for attention levels ($F_{(2)} = 1.31$, $p = .27$). The graph in Fig. 1 shows significantly higher values of anxiety at T1 for adolescents with high levels of attention to feelings in comparison to those with average or low levels of attention, registering a decrease in anxiety at T2 in the high-level attention group.

3.3.2. Clarity T1

No significant changes between T1 and T2 assessment were observed for different levels of mood clarity.

3.3.3. Repair T1

Results from repeated-measures ANOVA indicated significant interaction effects between the two assessments (T1 and T2) and different levels of emotional repair in depression ($F_{(2)} = 11.89$, $p < .001$), stress ($F_{(2)} = 5.43$, $p < .01$) and suicidal behavior ($F_{(2)} = 6.68$, $p < .01$). Tukey's HSD tests confirmed significant mean differences between all three repair levels on depression at T2 ($p < .05$). Significant mean differences were also observed between repair levels on stress and suicidal behavior at T2 ($p < .05$), except between average and high levels. The graphs in Fig. 2 show significantly higher values of depression and stress for adolescents with low levels of
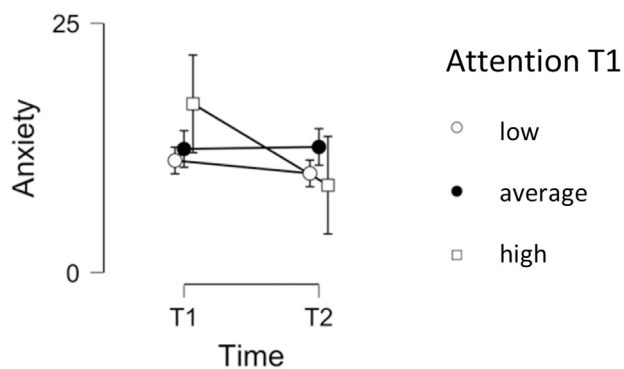
Fig. 1. Means and their confidence intervals (95%) of longitudinal measures (T1 and T2) of mental health variables and the interaction with levels of emotional attention at T1.

emotional repair in comparison to those with average and high levels of repair. Fig. 2 shows how the means of depression and stress in the low and high-level group decrease, while they increase in the average-level group. Regarding suicidal behavior, the graph in Fig. 2 indicates higher values of the variable in adolescents with low levels of emotional repair compared to those with average and high levels. Fig. 2 shows how the means decrease in the low and high-level group, while there is no change in the average-level group.

3.3.4. Self-esteem T1

Results showed significant interaction effects between the two assessments at T1 and T2 and different levels of self-esteem in the depression ($F_{(2)} = 15.65$, $p < .001$), anxiety ($F_{(2)} = 10.06$, $p < .001$), stress ($F_{(2)} = 17.32$, $p < .001$) and suicidal behavior ($F_{(2)} = 21.53$, $p < .001$). In addition, there was a significant effect for self-esteem levels ($F_{(2)} = 3.06$, $p = 05$) on depression scores. Tukey's HSD tests confirmed significant mean differences between self-esteem levels on depression, anxiety and stress at T2 ($p < .05$), except between low and average levels. Significant mean differences were also observed between the three self-esteem levels on suicidal behavior at T2 ($p < .05$), except between average and high levels. The graphs in Fig. 3 show significantly higher values of depression for adolescents with low and average levels of self-esteem in comparison to those with high levels of self-esteem. Fig. 3 shows how the means of depression in the low-level group decrease, while they increase in the average and high-level group. With regard to anxiety scores, the graph in Fig. 3 shows significantly higher values of anxiety for adolescents with low and average levels of self-esteem in comparison to those with high levels of self-esteem. Fig. 3 shows how the means of anxiety in all groups decrease, registering a greater decrease in the average-level group. In addition, the graphs in Fig. 3 show significantly higher values of stress and suicidal behavior for adolescents with low and average levels of self-esteem in comparison to those with high levels of self-esteem. Fig. 3 shows how

the means of stress and suicidal behavior in the low and high-level group decrease, while they increase in the average-level group.

3.4. Mediation models

The mediating role of self-esteem in the relationship between emotional intelligence and mental health problems was tested, controlling the effects of gender, age and mental health problems before the pandemic (T1). The statistically significant mediation models are shown in Table 4.

The first model represented the mediating role of self-esteem in the relationship between mood clarity and depression symptoms. Clarity had a positive and significant direct effect on self-esteem and self-esteem had a negative direct effect on depressive symptoms. The standardized indirect effect from clarity at T1 to depressive symptoms at T2 through self-esteem was negative and significant, while the direct effect was not significant ($p > .05$), indicating a complete mediation. Furthermore, depressive symptoms at T1 significantly predicted depression at T2 (standardized coefficient = .37; $p < .001$), while gender and age were non-significant covariates. The total mediation model predicted 24% of the variance of depression (T2).

In the second model, the mediating role of self-esteem in the relationship between emotional repair and depression symptoms was tested. Emotional repair had a positive and significant direct effect on self-esteem and self-esteem had a negative direct effect on depressive symptoms. The standardized indirect effect from repair at T1 to depression at T2 through self-esteem was negative and significant. There was no direct effect from repair to depressive symptoms ($p > .05$), indicating complete mediation. Furthermore, depressive symptoms at T1 were a significant predictor of depression at T2 (standardized coefficient = .32; $p < .001$), while gender and age were non-significant covariates. The total mediation model predicted 25% of the variance of depressive symptoms (T2).

In the third model, the mediating role of self-esteem in the relation between emotional repair and anxiety symptoms was examined. Repair had a positive and significant direct effect on self-esteem and self-esteem had a negative direct effect on anxiety symptoms. The standardized indirect effect from repair at T1 to anxiety at T2 through self-esteem was negative and significant, while the direct effect was not significant ($p > .05$), indicating a complete mediation. Furthermore, anxiety symptoms at T1 significantly predicted anxiety symptoms at T2 (standardized coefficient = .40; $p < .001$), while gender and age were non-significant covariates. The total mediation model predicted 20% of the variance of anxiety symptoms at T2.

Finally, the fourth model shows the mediating role of self-esteem in the relationship between mood clarity and stress symptoms. Clarity had a positive and significant direct effect on self-esteem and self-esteem had a negative direct effect on stress symptoms. The standardized indirect effect from clarity at T1 to stress at T2 through self-esteem was negative and significant, while the direct effect was not significant ($p > .05$), indicating a complete
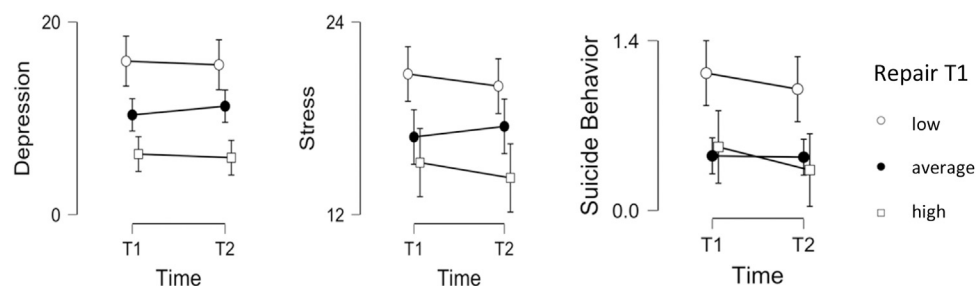

Fig. 2. Means and their confidence intervals (95%) of longitudinal measures (T1 and T2) of mental health variables and the interaction with levels of emotional repair at T1.
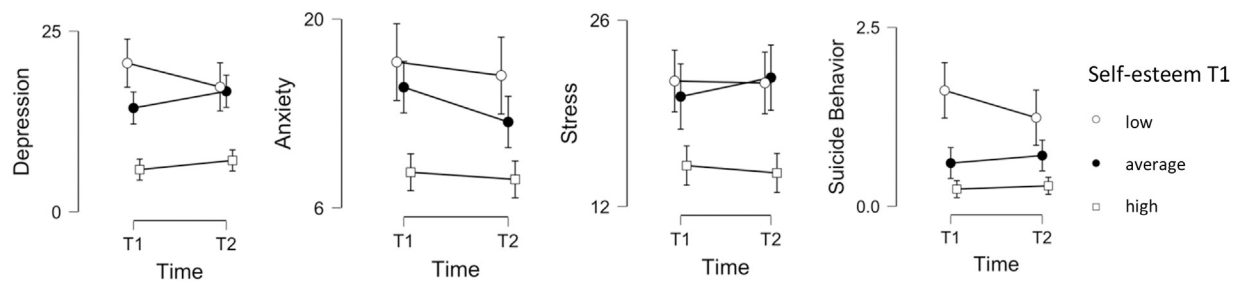
Fig. 3. Means and their confidence intervals (95%) of longitudinal measures (T1 and T2) of mental health variables and the interaction with levels of self-esteem at T1.

Table 4
Analysis of the mediating capacity of self-esteem in the relationship between perceived emotional intelligence and mental health problems.

IV (T1)	M (T1)	DV (T2)	R^2	Effect of IV on M	Effect of M on DV	Direct effect	Standardized indirect effect	95% CI for standardized indirect effect	Total effect
Clarity	Self-esteem	Depression	.24***	.14*	−.39***	.00	−.06	−.12, −01	−.08
Repair	Self-esteem	Depression	.25***	.31***	−.36**	−.10	−.11	−.22, −03	−.27*
Repair	Self-esteem	Anxiety	.20***	.44***	−.21*	.08	−.09	−.21, −01	−.04
Clarity	Self-esteem	Stress	.17***	.25**	−.21*	.03	−.05	−.12, −01	−.04

Note. IV: independent variable; M: mediator; DV: dependent variable; CV: covariable. bootstrap samples: 10,000. R^2: coefficient of determination. *$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

mediation. Furthermore, stress symptoms at T1 were significant predictor of stress symptoms at T2 (standardized coefficient = .33; $p < .001$), while gender and age were non-significant covariates. The total mediation model predicted 17% of the variance of stress symptoms at T2.

3.5. Moderated mediation model

For all four models that showed significant mediations, moderated mediations were performed with COVID-19 related variables at T2 as moderators of the relationship between emotional intelligence, self-esteem and mental health outcomes, controlling the effects of gender, age and mental health problems before the pandemic (T1). The results from the statistically significant moderated mediation model are shown in Table 5.

Only the number of people living together during COVID-19 lockdown had a significant conditional effect on the indirect effect from emotional repair at T1 to anxiety symptoms at T2 through self-esteem at T1. Together the predictor variables explained about 34% of the variance in the sum of self-esteem at, and the full model explained about 25% of the variance in anxiety symptoms at T2. As predicted, we found self-esteem to be associated with symptoms of anxiety. Furthermore, in line with our moderation hypothesis, the relationship between self-esteem and anxiety was dependent on the number of people living together during COVID-19 lockdown, indicating that higher levels of the moderator (higher number of people living together) significantly increased the rates by which low self-esteem pre-pandemic predicts higher symptoms of anxiety during lockdown. Therefore, the number of people living together during the COVID-19 pandemic strengthened the negative effect of self-esteem on anxiety. With a statistically significant overall index of moderated mediation, the proposed moderated mediation model was supported, although the effect was rather small.

4. Discussion

The COVID-19 pandemic and the public health restrictions, such as lockdown and social distancing, that have been imposed to reduce the transmission of the coronavirus, had an unprecedented impact on people around the world, especially in the adolescent population (Marques de Miranda, da Silva Athanasio, Sena Oliveira, & Simoes-e-Silva, 2020; Ravens-Sieberer et al., 2022). The pandemic continues and there is an increased concern about multiple variants of the virus, while vaccination campaigns give hope and reduce the waves of infection. Despite these promising developments, understanding the psychological mechanisms of how COVID-19 pandemic impacts mental health has an important task when developing effective interventions within the public healthcare system. With the aim of providing empirical evidence on the protective factors of mental health during COVID-19, the present study assessed a variety of factors (e.g., emotional intelligence, self-esteem and potential sociodemographic and pandemic-related factors) associated with mental health problems in a longitudinal sample of adolescents before the outbreak of the COVID-19 (T1) and during the first wave of the pandemic in Spain (T2).

Regarding our first hypothesis, we expected that adolescents would show an increase in mental health symptoms (depression, anxiety, stress and suicidal behavior) with the onset of the pandemic and that these changes would be greater for those with low levels of emotional intelligence and self-esteem at T1. Our hypothesis for changes across groups was not supported. On average, adolescents who lacked personal and emotional strengths at T1 (high attention to feelings, low emotional repair and low self-esteem), exhibited higher levels of mental health symptoms during COVID-19 pandemic. However, this group of adolescents showed a decrease in self-reported anxiety, depression, stress and suicidal behavior, while these symptoms remained low and stable in adolescents with average or high self-esteem and emotional competence after the pandemic's onset. For instance, adolescents with high levels of attention to feelings exhibited a large decrease in self-reported anxiety symptoms during the COVID-19 lockdown, whereas emotional symptoms did not change in the average and low attention groups. Additionally, adolescents with low and high levels of emotional repair exhibited significant decrease in self-reported depression and stress symptoms, as well as suicidal behavior, while these mental health symptoms remained low or increased a little in adolescents with average levels of emotional repair during the first wave of COVID-19. Furthermore, our results suggest that there was a significant decrease in self-reported emotional symptoms and suicidal behavior among adolescents with low self-esteem during the lockdown due to COVID-19 pandemic, whereas the average and high self-esteem groups behaved differently. Self-reported depressive symptoms increased significantly,

Table 5

Results of moderated mediation analysis and conditional indirect effects.

Predictors (X)	Self-esteem at T1 (M)				Anxiety at T2 (Y)			
	B	SE	LLCI	ILCI	B	SE	LLCI	ILCI
Repair at T1	0.37**	0.06	0.25	0.49	0.17	0.12	−0.07	0.40
Self-esteem at T1					−0.43**	0.15	−0.73	−0.12
Num. people living together at T2 (W)					0.95	0.77	−0.57	2.48
Repair × Num. people living together (X*W)					0.25	0.15	−0.05	0.55
Self-esteem × Num. people living together (M*W)					−0.45*	0.19	−0.83	−0.07
Covariates at T1								
Age	0.34	0.86	−1.36	2.06	−2.06	1.45	−4.93	0.82
Gender	−0.56	0.42	−1.38	0.27	0.67	0.71	−0.72	2.07
Anxiety	−0.21**	0.05	−0.29	−0.11	0.34**	0.08	0.18	0.50
R^2	.34**				.25**			

Number of people living together at T2 (W)	Effect	Boot SE	Boot LLCI	Boot ULCI
−1 SD	.01	.09	−.16	.21
M	−.16	.07	−.31	−.04
+1 SD	−.33	.14	−.65	−.10
Index of moderated mediation	Index	Boot SE	Boot LLCI	Boot ILCI
W	−.17	.10	−.40	−.02

Note. Bootstrap samples = 10,000. *SE*: standard error; *LLCI*: lower level of the 95% confidence interval; *ULC*: upper level of the 95% confidence interval; *ULCI*: upper level of the 95% confidence interval; R^2: coefficient of multiple determination. Products are mean-centred. *p < .05. **p < .01.

while anxiety symptoms decreased in both groups; stress and suicidal behavior decreased in high self-esteem group, while they increased in the average self-esteem group.

Our findings suggest that COVID-19 related changes in mental health had a particularly mitigating effect among adolescents with low levels of personal and emotional strengths. The significant decrease in self-reported emotional symptoms and suicidal behavior among adolescents with low levels of emotional intelligence and self-esteem with the onset of the global pandemic could be explained by the temporal disconnection of environmental stressors caused by less satisfying social relationships, high school pressure or lack of leisure time. Previous studies have shown that despite the many difficulties and the emotional struggle experienced during COVID-19 lockdown, adolescents were able to focus on positive aspects of the unprecedented situation by embracing ways to enjoy time with the family at home, re-discovering oneself or sharing life at a distance (Fioretti et al., 2020; Postigo-Zegarra et al., 2021).

The second hypotheses addressed the mediating effect of self-esteem on the relationship between perceived emotional intelligence at T1 and mental health problems at T2, controlling for pre-pandemic symptomatology. In general, the results obtained from the tested mediation models suggest that pre-pandemic emotional abilities, i.e. mood clarity and emotional repair, are negatively associated with adolescents' mental health problems after the outbreak of COVID-19 pandemic, and this association is fully mediated by their perceived level of self-esteem.

First, in the tested mediation models that predicted depression, anxiety and stress symptoms, clarity and/or repair at T1 were positively associated with self-esteem at T1, which in turn was negatively related to the outcome variables at T2. The indirect effects of clarity and/or repair on emotional symptoms through self-esteem were negative and significant, however the direct effects were non-significant in all four models, indicating complete mediations. Thus, participants of this study who perceived themselves with the ability to understand and regulate emotional mood states accurately before the pandemic, presented less symptoms of depression during the first wave of COVID-19 and this might be explained because they had previously developed a higher level of self-esteem. These findings are in line with previous studies that stated the protective role of self-esteem and emotional intelligence on mental health symptoms (Domínguez-García & Fernández-Berrocal, 2018; Orth et al., 2016; Salguero et al., 2012). However our findings provide further evidence regarding the longitudinal positive impact of pre-pandemic personal and emotional strengths on adolescent mental health during the COVID-19 pandemic, highlighting the meditating role of self-esteem (Persich et al., 2021; Preston & Rew, 2022; Rossi et al., 2020a).

Furthermore, the tested mediation models with attention to feelings at T1 as predictor variable for mental health problems at T2 were not found to be significant because attention was not significantly related to mental health problems at T2. This finding is consistent with previous studies, which have indicated that the attention to feelings seems to be neither beneficial nor detrimental for mental health and well-being (Lischetzke & Eid, 2003), while other studies have indicated attention to be a risk factor for different health indicators such as perceived stress and suicidal behavior (Domínguez-García & Fernández-Berrocal, 2018; Villanueva et al., 2017).

Third, the prediction models with mediation analysis of suicidal behavior were not significant, neither perceived emotional intelligence nor self-esteem before the pandemic were strong enough predictors for suicidal behavior after the onset of COVID-19. However previous research has indicated the cross-sectional relationship

between adolescent's self-esteem, emotional intelligence and suicidal behavior (Domínguez-García & Fernández-Berrocal, 2018; Soto-Sanz et al., 2019), more studies with longitudinal design are needed to understand the psychological mechanisms underlying this relationship during an exceptional situation such as the current health crisis.

Finally, our third hypothesis stated that the COVID-19 pandemic-related variables (number of people living together, housing characteristics and frequency of going outside) would moderate the relationship between self-esteem at T1 and mental health problems at T2. The results obtained by moderated mediation analyses only partially confirmed this hypothesis, showing that only the number of people living together during COVID-19 pandemic had a significant conditional effect on the indirect effect from emotional repair on anxiety symptoms through self-esteem. Indeed, the results indicated that participants who lived with many people during the COVID-19 lockdown, their anxiety symptoms increased significantly at T2 if they showed low self-esteem at T1. However, adolescents who lived with fewer people showed stable anxiety levels at T2 regardless of their perceived level of self-esteem at T1. Therefore, the number of people living together during the COVID-19 pandemic enhanced the negative effect of self-esteem on anxiety. This finding suggests that the number of individuals living in the same household, rather than being a source of social support, appears to be a significant risk-factor for emotional symptoms, moderating the rates by which low levels of pre-pandemic self-esteem predicts higher symptoms of anxiety during COVID-19 lockdown. This could be due to the fact that people were suddenly forced to live with others in sometimes confined spaces that they might not have deliberately chosen, but rather the result of an unpredictable situation. In line with previous studies, the living conditions during lockdown are directly and indirectly related to adolescent's mental health outcomes such as depression, anxiety, stress (Okabe-Miyamoto et al., 2021; Schoeps et al., 2022; Tamarit et al., 2020).

5. Limitations

Although the current study is among the few to analyze changes in adolescent mental health symptoms using a longitudinal approach (i.e., with available pre-pandemic measures), several limitations should be noted. First, follow-up measurements are needed to further examine the long-term effects of the pandemic on adolescents during subsequent waves of infection. Second, generalizability may be limited, considering that the rather small sample size and the fact that the experience of the COVID-19 pandemic thus far has been dependent upon the location and timeframe in which data is collected. For the present study, data was collected during domestic lockdown in Spain, when the most restrictive measures were established including not leaving home except for a few exceptions. Third, this study has examined a limited number of variables, particularly emotional intelligence and self-esteem that may underlie mental health problems in adolescents during the COVID-19 pandemic. The influence of other variables such as resilience and ego development could be studied, which are also relevant and should be taken into account in future studies. Fourth, although this is a study conducted under special circumstances due to the COVID-19 pandemic, the statistical power is not optimal and a priori calculations of the required sample should be made. Finally, although the use of self-report measures was appropriate for the sample studied, with adolescents and young people being reliable reporters of their feelings and thoughts, future research may use mixed methods (qualitative and quantitative), or include objective measures to reduce common method bias.

6. Conclusions

The COVID-19 pandemic continues to carry new waves of infection and there are concerns about multiple variants of the virus, making it necessary to continue to implement public health restrictions such as social distancing, quarantine, mobility restrictions, among others. Society seems to be adjusting to the current pandemic and the new circumstances on a social, political and personal level, but the public health system in particular is making enormous efforts to cope with the major challenges (i.e., global vaccination campaigns). However, there is already ample empirical evidence that many of these circumstances pose a threat to the mental health of children and adolescents and compromise their positive development. Studies such as ours, therefore, provide valuable empirical data to better understand the psychological mechanisms underlying adolescent mental health during the COVID-19 pandemic.

We discovered that the mental health of girls and boys were equally affected by COVID-pandemic. Furthermore, we observed that adolescents with low levels of perceived emotional intelligence and self-esteem prior to the COVID-19 outbreak experienced significant decreases in self-reported anxiety, depression, stress and suicidal behavior, while adolescents from the average or high level groups shown no significant changes in mental health symptoms after the pandemic's onset. Finally, our findings highlight the protective role of self-esteem in mitigating mental health problems during the COVID-19. Prevention and intervention efforts may be able to capitalize on the development of self-esteem and emotional intelligence to enhance healthy development among young people affected by a large-scale crisis such as the current pandemic. After all, the COVID-19 pandemic is likely exacerbating an accelerating pattern of mental disorders among adolescents and young adults. Therefore, promoting early interventions to develop their personal and emotional strengths may help them overcome this crisis, reduce their emotional distress and enhance mental health for future crises.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author (IMC). The data are not publicly available due to the fact that they constitute an excerpt of research in progress.

Author contribution

All authors contributed equally to the study design, participants' recruitment, data collection, analysis/interpretation of data, and writing up the study and the paper. All of them read and approved the final manuscript.

Disclosure of interest

The authors declare that they have no competing interest.

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