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Mental Health in Chilean Higher Education Students During the COVID-19 Pandemic: A Longitudinal Study

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Objective: The COVID-19 pandemic has required important changes in the lifestyles and quality of life of higher education students, generating emotional distress. This study sought to evaluate a predictive model of emotional distress and positive mental health through measures of posttraumatic stress symptoms (PTSS) and posttraumatic growth (PTG) in Chilean higher education students during the pandemic. ***Method:*** To this end, 502 students (67.8% female), aged 18–44 years, were surveyed at two time points during the pandemic, separated by 6 months. Potential predictors included emotional regulation strategies, perceived social support, sociodemographic characteristics, factors related to the pandemic, and students' experiences related to online classes. ***Results:*** Findings indicated that PTSS levels were generally stable across the two time points, but PTG levels increased. In addition, emotional regulation strategies (suppression, cognitive reappraisal), perceived social support, and female gender predicted both PTSS and PTG 6 months later; students' number of hours of screen time for school also influenced PTG. ***Conclusions:*** Findings enhance understanding of the processes contributing to PTSS and PTG in higher education students. The need to improve quality of life and mental health in higher education students, including individual- and institutional-level strategies, is discussed.

Clinical Impact Statement

The results highlight the importance of attending to student adjustment in online classes during the pandemic, with the goals of reducing students' stress as well as their risk for negative mental health consequences. Results also suggest the potential benefit of promoting students' connections with their networks and potential sources of social support, such as their families, friends, or fellow students. Furthermore, findings indicate that preventive or clinical interventions that include a focus on emotional regulation can help decrease the distress associated with stress and facilitate the perception and experience of positive changes from the pandemic experience.

Keywords: COVID-19, emotional regulation, posttraumatic growth, posttraumatic stress, social support

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The respiratory disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), known as COVID-19, was declared a pandemic by the World Health Organization (WHO) on March 11, 2020, after affecting millions of people and becoming an unprecedented threat. Globally, as of April 2022, more than 513 million people had been infected, of which 6.23 million have died (Johns Hopkins University, 2022). In Chile in that same month, official figures from the Ministry of Health (2022) detailed more than 3,558,000 confirmed cases among the country's roughly 19 million people, whereas the number of deaths was around 58,000.

Epidemic outbreaks can have negative consequences for mental health. Their effects can be similar to those of a natural disaster (Berman, 2009), because they imply the presence of an uncontrollable danger, capable of altering people's well-being, often causing

fear, anxiety, posttraumatic stress, and suicidal tendencies (Wu et al., 2009; Yip et al., 2010). In line with such findings, the current pandemic's characteristics bring substantial risk.

The COVID-19 pandemic has led many countries to institute forced confinement to stop the spread of the virus (Brooks et al., 2020). Studies suggest that this measure has elicited symptoms of stress, anxiety, and depression (Andrades et al., 2021; Wang et al., 2020), as well as fear, loneliness, and increased consumption of alcohol and other drugs (Qiu et al., 2020; Shigemura et al., 2020). Longitudinal studies have reinforced such findings, with reports of higher levels of anxious and depressive symptoms compared with before the pandemic in the same population (Elmer et al., 2020).

Although the stress caused by events of this type may be necessary to cope actively with the crisis, the persistence of such circumstances over time can lead to burnout, distress, and impaired social or occupational functioning that may lead to increased vulnerability to mental health disorders (González Castro & Busto, 2019). The COVID-19 pandemic and the associated confinement, uncertainty, and changes in day-to-day living it has caused have now lasted for more than two years. It has been a chronic stressor with an end that is not yet possible to predict.

Previous studies on epidemics and pandemics have documented an increase in posttraumatic stress symptoms (PTSS) in significantly affected individuals (Brooks et al., 2020; Ramírez et al., 2020). In a similar vein, particularly among those who were directly impacted, research has frequently found nonspecific anxious and psychosomatic symptomatology associated with stress and, depending on the nature of the individual's specific experience, PTSS or posttraumatic stress disorder (e.g., Cova & Rincón, 2010).

In the current pandemic context, studies have detected that the highest levels of symptoms of stress and health problems occur among young adults between 18 and 26 years of age (Li et al., 2020). Other research efforts (Andrades et al., 2021; Sandín et al., 2020) have reported similar findings, with those between 18 and 30 years of age endorsing higher levels of emotional distress compared with adults in higher age ranges. Within this age range, many individuals are enrolled in higher education, with the student population being one of the most affected by the pandemic (UNESCO, 2020).

Higher education students have had to adapt to substantial, sometimes drastic changes to their day-to-day lives. For example, many students have had to continue their online classes without necessary equipment, with poor Internet signal quality, or with inadequate space conditions, difficulties associated with conditions of socioeconomic inequality (Lloyd, 2020; Ordorika, 2020). Such conditions can disrupt one's progress or threaten the prospect of starting a career (Andrades et al., 2021). Prior studies have found that the pandemic has led some students to evaluate abandoning their studies (Lovón & Cisneros, 2020), generated delays in the fulfillment of their tasks (Cao et al., 2020), and pushed them to a sedentary lifestyle (Savage et al., 2020). Given these changes and their consequences for daily living, stress as well as depressive and anxiety symptoms have risen in higher education students (Mechili et al., 2021; Odriozola-González et al., 2020). These studies underscore some key ways in which the pandemic influenced the mental health of higher education students, which could also affect the broader teaching-learning environment (Xiang et al., 2020).

In addition, the measures of confinement and social distancing in response to the pandemic have affected social connectedness and hindered their interpersonal relationships during an influential period for their social development. Therefore, people in this age range are at risk for effects on mental health that could develop postpandemic (Huarcaya-Victoria, 2020).

With respect to Chile, although research involving this age range is limited, the available results have shown an increase in symptoms of psychological distress in higher education students during the pandemic. For instance, reports indicate that three of four students (particularly women) endorse worse or much worse moods compared with the prepandemic context (Mac-Ginty et al., 2021). Three of four students in this age range also reported mild or greater stress symptoms at the onset of the pandemic (Andrades et al., 2021).

Although events such as pandemics can generate high levels of stress and other negative consequences, it is also possible for affected individuals to experience positive changes or learning from having to deal with these experiences. This phenomenon (i.e., the perception of positive changes resulting from one's struggle with a highly stressful event and its aftermath) has been referred to as posttraumatic growth (PTG; Calhoun & Tedeschi, 2004). PTG may involve the perception of positive changes about oneself, one's relationships with others, or one's philosophy of life (García et al., 2013; Tedeschi & Calhoun, 1996).

According to Tedeschi and Calhoun (2004), for an adverse experience to produce PTG, a moderate level of distress is necessary (Cho & Park, 2013). Thus, the distress generated from the event and its aftermath can contribute to the development of both PTSS and PTG, depending on the psychological processes involved (e.g., the emotional regulation strategies used, the social support perceived by the individual). The distress not only can lead to PTSS; it is thought to help catalyze the PTG process. In turn, studies regularly document the co-occurrence of PTSS and PTG (Chi et al., 2020; Shigemoto & Poyrazli, 2013), with some researchers detailing a curvilinear, or "inverted U," relationship between PTSS and PTG, such that moderate levels of PTSS are associated with the highest levels of growth (see Shakespeare-Finch & Lurie-Beck, 2014 for a meta-analysis of the PTSD–PTG relationship).

Evidence indicates that the use of an emotional regulation strategy such as cognitive reappraisal of the stressful or traumatic experience is related to PTG (Bustos, 2011; Moore et al., 2008), whereas a more avoidant strategy such as emotional suppression tends to increase distress (Fernández et al., 2001). Results also suggest that high perceived social support relates to higher PTG and lower PTSS (Calhoun et al., 2011; Prati & Pietrantoni, 2009).

PTG has been documented across diverse adversities, countries, and cultures (e.g., Calhoun et al., 2011; Tedeschi & Calhoun, 2004). In the context of the COVID-19 pandemic, significant levels of PTG have been found via studies conducted in Spain (Sandín et al., 2020; Vazquez et al., 2021) and China (Chi et al., 2020), with the latter effort involving higher education students. These studies confirm that in adverse situations people can also develop tools, perceive learning, or experience varying positive changes. However, the literature regarding the PTG process over time is less well-developed generally, and work regarding PTG in the context of the pandemic is still emerging. Further research is necessary to enhance understanding of possible outcomes and their predictors, especially given that the health crisis has not yet ended.

Although considerable research to date has focused on COVID-19, the initial waves focused primarily on the clinical and epidemiological characteristics of the virus, with comparatively less

information available on the mental health of individuals (Huarcaya-Victoria, 2020). That literature is now expanding; however, much of the published research on mental health and psychological well-being has been cross-sectional, with fewer longitudinal studies to date exploring symptoms of emotional distress among higher education students during the pandemic. Results from these works have been mixed. For instance, one documented a decrease in anxiety and depression symptoms after two weeks of confinement measures (Li et al., 2020), whereas another found increased anxiety severity (Elmer et al., 2020).

The present study aimed to assess predictors of stress-related distress and growth in higher education students at two points in time during the pandemic. Although this effort uses measures of PTSS and PTG as other studies have done (Chi et al., 2020; Vazquez et al., 2021), it is important to acknowledge that there are limitations to evaluating potential "posttraumatic" reactions when the pandemic is ongoing. With that as a backdrop, the present study's purpose is to evaluate longitudinally a model for the prediction of PTSS and PTG in higher education students during the COVID-19 pandemic that includes sociodemographic, pandemic experience, and online learning variables, as well as such psychological variables as emotional suppression, cognitive reappraisal, and perceived social support.

Method

Design

A quantitative, descriptive, and correlational design was used. Data collection occurred at two time points: in October 2020 and from April to May, 2021, 7 and 14 months, respectively, from the start of the COVID-19 pandemic in Chile.

Participants

A total of 509 students from different institutions of higher education residing in Chile who attended online classes during the COVID-19 pandemic participated. Of these, 345 were female (67.8%). The mean age was 22.20 years (SD = 2.87), with a range from 18 to 44 years. At Time 2 (T2), six to eight months later, 502 of these students completed the protocol, including 340 women (67.7%), with the same age range (M = 22.22; SD = 2.88). Among the seven nonrespondents at T2, four had graduated and one had withdrawn from the university.

Information regarding the students' institution was not collected. Participating students ranged in class level from first to fifth year (M = 3.01; SD = 1.44) and they were studying 45 different majors or careers. The most frequently reported were psychology (24%), engineering (16.3%), kinesiology (7.1%), technical (4.7%), and medicine (4.3%).

Measures

Posttraumatic Stress Symptoms

The Short Posttraumatic Stress Disorder Rating Interview – expanded versión (SPRINT-E; Connor & Davidson, 2001) assesses PTSS, according to *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (*DSM–IV*) criteria. Validated with Chilean participants by Leiva and Gallardo (2013), it was used in the present study as an indicator of emotional distress (i.e., not for diagnosis). Its 12 items are answered using a Likert scale from 0 (*not at all*) to 3 (*very much*). In the present study, α = .92 at T1 and T2.

Posttraumatic Growth

The Posttraumatic Growth Inventory – short form (PTGI-SF; Cann et al., 2010) assesses PTG and has been validated for use in the Chilean population (García & Wlodarczyk, 2016). Its 10 items are answered on a Likert scale ranging from 0 (*no change*) to 5 (*very important change*). The total score was used here as an indicator of positive change during the pandemic. In this study, T1 α = .91 and T2 α = .89.

Emotion Regulation

The 10-item Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) assesses two factors—emotional suppression and cognitive reappraisal—and was validated for use in Spanish by Cabello et al. (2006). Respondents answer using a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). In this study, cognitive reappraisal α = .82 at T1 and T2; emotional suppression T1 α = .78 and T2 α = .81.

Perceived Social Support

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988), validated for use in Chile (Arechabala & Miranda, 2002), consists of 12 items regarding perceived social support from family, friends, and significant others. The present study used the total score, with higher scores indicating higher levels of perceived support. The MSPSS uses a Likert-type response format, ranging from 1 (*almost never*) to 4 (*almost always*). T1 and T2 α = .93.

Sociodemographics, Pandemic Experience, Online Learning Experience

An additional questionnaire was developed for this work to obtain sociodemographic information (e.g., gender, age, class level), dichotomous (yes/no) pandemic-related indicators (e.g., if student has been infected, if a friend or relative has died from the virus, type of confinement at the time of assessment), and data about students' online learning experience (e.g., Likert-type items regarding quality of Internet connection, average screen hours, quality of physical space for connecting to online classes).

Procedure

Higher education students residing in Chile were recruited through virtual social networks, using purposive sampling. For this purpose, the link was sent to student groups in different social networks, such as whatsapp, facebook, or email lists, requesting also that they share the study information with classmates and contacts who are pursuing higher education. They were provided with an access link to a Google form, which informed them about the nature and ethical aspects of the research, such as confidentiality and the data security plan. After agreeing to participate, students accessed the questionnaire, which was designed to move to the next item as long as all previous items were answered, so that no missing data were counted. Given the nature of this recruitment approach, it is impossible to determine the number of students

who were provided with information about the study or to assess for potential differences between those who chose to participate and those who did not.

Time 1 data collection took place throughout October 2020 via a self-administered online questionnaire. Time 2 was carried out April through May, 2021. Those who participated in T1 were contacted, first by email, then reminded (if they had not completed the questionnaire) by whatsapp and, finally, by telephone to complete the T2 study measures. The project was reviewed and approved by the Scientific Research Ethics Committee of the Universidad Central de Chile, with resolution number 37/2020.

Data Analysis

Following calculation of descriptives and correlations, independent two-sample *t* test and one-way ANOVA were used to assess differences in PTSS and PTG on other predictor variables. To test the predictive value of the T1 variables on T2 PTSS and PTG, hierarchical multiple linear regression was used. SPSS v.21 (IBM Corp., 2011) was used for analyses.

Results

Preliminary Analyses

Table 1 details descriptive statistics and Pearson's *r* correlations for key study variables. T2 PTSS correlated significantly with all T1 variables evaluated except PTG, showing the strongest positive association with T1 PTSS ($r = .70$) and emotional suppression ($r = .25$) and the strongest negative associations with T1 social support and cognitive reappraisal ($r = -.28$ and $-.22$, respectively). Besides T1 PTG ($r = .72$), T1 social support ($r = .26$) and cognitive reappraisal ($r = .23$) were most strongly related to T2 PTG.

Student's *t* test for related samples was used to assess the changes in PTSS and PTG from T1 to T2. Results indicate that the change in PTSS was not significant ($t = -.80$; $p = .42$), but the change in PTG was significant, with students reporting higher PTG scores at T2 than at T1 ($t = -3.50$; $p < .001$).

Associations With T2 PTSS: Developing a Predictive Model

When assessing the sociodemographic variables' relationship with T2 PTSS, significant differences were found in sex, $t(500) = 3.284$, $p < .001$, such that women reported more PTSS ($M = 28.88$; $SD = 7.90$) than men ($M = 26.34$; $SD = 8.54$). In addition, age ($r = -.15$; $p <$, 001) and class level ($\rho = -.10$; $p = .031$) were inversely related to T2 PTSS such that older students and those further along in their studies endorsed lower levels of T2 PTSS. Those who reported not taking medication for mental health problems showed less PTSS ($M = 27.48$; $SD = 8.13$) than people who take such medications, either since before the pandemic ($M = 30.96$; $SD = 8.10$) or since the pandemic ($M = 32.20$; $SD = 7.61$), with $F(2, 497) = 7.357$, $p < .001$. There were no differences between those who have children ($n = 43$) and those who do not ($n = 466$).

Examination of pandemic-related variables and T2 PTSS revealed that students who had a family member or friend who died of COVID-19 had higher levels of PTSS ($M = 30.59$; $SD = 7.54$) than those who did not have someone close die as a result of the virus ($M = 27.85$; $SD = 8.21$), with $t(500) = -2.013$, $p = .045$. There were no differences between those who had been diagnosed with COVID-19 and those who had not been diagnosed, nor were there differences according to the type of confinement (i.e., voluntary, mandatory, none) at the time of both assessments.

Among correlations between online learning experiences and T2 PTSS, significant associations were found with "quality of Internet connection" ($\rho = -.14$, $p = .002$), "average hours in front of the screen for study purposes" ($\rho = -.10$; $p = .03$), and "quality of physical space dedicated to online classes" ($\rho = -.15$; $p < .001$). Specifically, better quality Internet connection, fewer hours on screens for study, and better quality of physical space dedicated to online learning were associated with lower levels of PTSS at T2.

Next, hierarchical multiple linear regression was used to assess the influence of T1 variables on T2 PTSS (see Table 2). T1 PTSS was entered in the first step, whereas the second step included the sociodemographic variables with a significant bivariate relationship with T2 PTSS (i.e. gender, age, and class level). In Step 3, the pandemic- and online learning-related variables that had shown a significant relationship with T2 PTSS were included. In the fourth step, psychological variables were included. For the final model, $F(11, 490) = 54.24$, $p < .001$, with an $R^2 = .55$ (Adjusted $R^2 = .54$). Significant influences were T1 PTSS ($\beta = .62$), cognitive reappraisal ($\beta = -.10$), emotional suppression ($\beta = .11$), and social support ($\beta = .11$).

Associations With T2 PTG: Developing a Predictive Model

A structurally similar approach was used to examine relationships with T2 PTG. As with T2 PTSS, the relationship of sociodemographic

Table 1
Descriptive Statistics and Correlations Involving Key Study Variables (n at T1 = 509, n at T2 = 502)

Variables	Min	Max	*M*	*SD*	2	3	4	5	6	7
1. Cognitive reappraisal T1	6	42	28.97	6.47	−.02	.29***	−.20***	.33***	−.22***	.23***
2. Emotional suppression T1	4	28	15.58	5.50	—	−.36***	.31***	−.12**	.25***	−.14***
3. Social support T1	13	48	34.82	8.91		—	−.42***	.28***	−.28***	.26***
4. Posttraumatic stress symptoms T1	12	48	27.91	8.14			—	.02	.70***	.01
5. Posttraumatic growth T1	10	60	30.63	12.57				—	.03	.72***
6. Posttraumatic stress symptoms T2	12	47	28.06	8.19					—	.02
7. Posttraumatic growth T2	10	60	32.13	11.93						—

Note. T1 = Time 1; T2 = Time 2.
** $p < .01$. *** $p < .001$.

Table 2
Hierarchical Multiple Linear Regression Predicting Posttraumatic Symptoms at Time 2

Step	Variable	R^2	ΔR^2	Nonstandardized coefficients		Standardized coefficients	
				B	*SE*	β	*t* value
1		.49					
	(Constant)			8.37	0.93		8.98***
	Posttraumatic stress symptoms T1			**0.71**	**0.03**	**.70**	**22.02*** **
2		.50	.01				
	(Constant)			11.10	2.39		4.63***
	Posttraumatic stress symptoms T1			**0.70**	**0.03**	**.69**	**21.25*** **
	Sex (0 = female; 1 = male)			**−1.19**	**0.56**	**−.07**	**−2.12***
	Age			−0.11	0.10	−.04	−1.14
	Class level			0.15	0.20	.03	0.77
3		.51	.01				
	(Constant)			11.46	3.20		3.58
	Posttraumatic stress symptoms T1			**0.70**	**0.03**	**.69**	**20.66*** **
	Sex (0 = female; 1 = male)			−0.98	0.57	−.06	−1.72
	Age			−0.10	0.10	−.04	−1.03
	Class level			0.17	0.20	.03	0.84
	PV: Someone close died (0 = no; 1 = yes)			1.40	0.98	.05	1.44
	OL Internet connection quality			**−0.76**	**0.36**	**−.07**	**−2.11***
	OL: Hours of screen time			0.13	0.27	.02	0.48
	OL: Quality of physical space			0.37	0.28	.05	1.33
4		.55	.04***				
	(Constant)			16.34	3.50		4.67
	Posttraumatic stress symptoms T1			**0.63**	**0.03**	**.62**	**18.49*** **
	Sex (0 = female; 1 = male)			**−1.244**	**0.55**	**−.07**	**−2.25***
	Age			−0.09	0.10	−.03	−0.88
	Class level			0.24	0.19	.04	1.23
	PV: Someone close died (0 = no; 1 = yes)			1.72	0.94	.06	1.84
	OL: Internet connection quality			−0.49	0.35	−.05	−1.39
	OL: Hours of screen time			0.13	0.26	.02	0.51
	OL: Quality of physical space			0.48	0.27	.06	1.81
	Cognitive reappraisal T1			**−0.13**	**0.04**	**−.10**	**−3.23*** **
	Emotional suppression T1			**0.16**	**0.05**	**.11**	**3.14** **
	Social support T1			**−0.10**	**0.03**	**.11**	**3.02** **

Note. Significant predictors are represented in boldface text. T1 = Time 1; T2 = Time 2; OL = online learning; PV = pandemic-related variable.
* $p < .05$. ** $p < .01$. *** $p < .001$.

variables with T2 PTG was assessed. Significant sex differences were found, $t(500) = 2.37$, $p < .018$, such that women endorsed more PTG ($M = 32.99$; $SD = 11.90$) than men ($M = 30.30$; $SD = 11.30$). Differences were also found with respect to the presence of children, $t(500) = -3.27$, $p < .001$, such that those with children reported higher levels of PTG ($M = 38.33$; $SD = 13.27$) than those without children ($M = 31.65$; $SD = 13.27$). Age was inversely correlated with T2 PTG ($r = -.11$; $p < .018$), such that older students reported lower levels of growth. No significant differences were detected with respect to students' class level or use of medication for mental health problems.

No significant relationships were found between pandemic-related variables and T2 PTG. Among the online learning variables, average screen hours for school was the only significant correlate. It was inversely related to T2 PTG ($\rho = -.10$; $p = .027$); those reporting more screen time for their studies tended to endorse lower T2 PTG.

Finally, hierarchical multiple linear regression was used to assess the influence of T1 variables on T2 PTG (see Table 3). T1 PTG was entered first, and the second step included the sociodemographic variables that related significantly to PTG (i.e., gender, age, and presence of children). Step 3 included screen time for school; psychological variables were included in Step 4. For the final model, $F(8, 493) = 79.81$, $p < .001$, with an $R^2 = .56$ (Adjusted $R^2 = .56$). Significant influences were T1 PTG ($\beta = .65$), hours of screen time for school ($\beta = -.09$), cognitive reappraisal ($\beta = .13$), emotional suppression ($\beta = -.09$), and social support ($\beta = .07$).

Discussion

The present research longitudinally evaluated a predictive model of PTSS and PTG in higher education students during the COVID-19 pandemic. Model variables included sociodemographics, indicators of pandemic and online learning experiences, and psychological constructs such as cognitive reappraisal, emotional suppression, and perceived social support as potential predictors of PTSS and PTG at T2.

Of the sociodemographic variables, being female was the only one that predicted both PTSS and PTG at T2. This is consistent with the positive relationship between being female and PTSS and PTG in other studies, as reflected in the meta-analyses of Brewin et al. (2000) and Vishnevsky et al. (2010). Vishnevsky and colleagues explain the association by noting that women tend to think repetitively about a stressful event to a greater extent than men. This practice can be negative and unconstructive emotionally,

Table 3
Hierarchical Multiple Linear Regression Predicting Posttraumatic Growth at Time 2

Step	Variable	R^2	ΔR^2	Nonstandardized coefficients		Standardized coefficients	
				B	*SE*	β	*t* value
1		.52					
	(Constant)			11.15	0.98		11.38
	Posttraumatic growth T1			**0.68**	**0.03**	**.72**	**23.11*** **
2		.52	.00				
	(Constant)			8.21	3.14		2.61
	Posttraumatic growth T1			**0.67**	**0.03**	**.71**	**22.58*** **
	Sex (0 = female; 1 = male)			−1.33	0.80	−.05	−1.66
	Age			0.16	0.14	.04	1.17
	Do you have children? (0 = no; 1 = yes)			1.26	1.55	.03	0.82
3		.53	.01				
	(Constant)			13.60	3.68		3.69
	Posttraumatic growth T1			**0.67**	**0.03**	**.71**	**22.70*** **
	Sex (0 = female; 1 = male)			**−1.68**	**0.81**	**−.07**	**−2.08***
	Age			0.09	0.14	.02	0.66
	Do you have children? (0 = no; 1 = yes)			1.17	1.54	.03	0.76
	OL: Hours of screen time			**−1.06**	**0.38**	**−.09**	**−2.77** **
4		.56	.03***				
	(Constant)			9.34	4.31		2.17
	Posttraumatic growth T1			**0.61**	**0.03**	**.65**	**20.24*** **
	Sex (0 = female; 1 = male)			**−1.68**	**0.79**	**−.07**	**−2.12***
	Age			0.03	0.14	.01	0.20
	Do you have children? (0 = no; 1 = yes)			1.14	1.49	.03	0.77
	OL: Hours of screen time			**−1.01**	**0.37**	**−.09**	**−2.75** **
	Cognitive reappraisal T1			**0.24**	**0.06**	**.13**	**4.04*** **
	Emotional suppression T1			**−0.18**	**0.07**	**−.09**	**−2.57** **
	Social support T1			**0.09**	**0.05**	**.07**	**2.00***

Note. Significant predictors are represented in boldface text. T1 = Time 1; T2 = Time 2; OL = online learning variable.
* $p < .05$. ** $p < .01$. *** $p < .001$.

increasing discomfort and contributing to PTSS, but it can have positive, productive implications as well, supporting learning from the experience and meaning making. which could help foster growth or benefit-finding from adverse experiences (see Watkins, 2008). Although the present findings are consistent with the broader PTSS and PTG literature, it is also possible that they reflect some of the disproportionate impact that the pandemic has had on women (see, e.g., Riecher-Rössler, 2022). That is, in light of the social construct of womanhood (in multiple contexts) and the role of women in Chilean society, it may be that such responsibilities as caring for sick relatives, maintaining households (or helping at home), and homeschooling children or younger siblings may have fallen primarily to women. These weighty task demands may have exacerbated the impact of the pandemic and, in turn, the distress experienced by women in our sample. Given the linkage between distress, or PTSS, and PTG, the fact that students who had children also reported higher levels of PTG is consistent with this possibility.

Although each of the variables related to online learning was correlated with T2 PTSS, they were not significant contributors to the multivariate analysis. However, the number of hours spent in front of the screen for school did have a significant influence on the prediction of PTG such that more hours of screen time for school or studying contributed to lower T2 PTG levels. It is possible that this result may reflect the fact that, when students need to be connected for so many hours, this precludes time for reflection, the search for meaning, or other deliberate ruminative processes believed necessary for the PTG process (e.g., Tedeschi & Calhoun, 2004). Excessive screen hours related to academic demands can also interfere with students' experience of social connectedness and support and tax their cognitive capacities, resources related to PTG and to well-being, more broadly (e.g., Tedeschi & Calhoun, 2004). Institutions of higher education and their instructions should be mindful of the screen-based demands placed on students, particularly during long-term adverse experiences such as the pandemic, and should consider implementing "disconnection days" every few weeks, to alleviate the burden of chronic screen exposure.

The study's psychological variables—cognitive reappraisal, emotional suppression, and perceived social support—were each significant in the prediction of T2 PTSS and T2 PTG. Emotional regulation strategies are used to cope with negative emotions that arise on exposure to highly stressful events (Gross, 2013), and different practices yield varying results. For instance, suppression inhibits the emotional impact of adverse events and negative emotional responses by restricting affective processing and expression; however, its regular use can have a negative impact on mental health (Fernández et al., 2001; Gross & John, 2003). For its part, cognitive reappraisal involves thinking in a different way in relation to a stressful event; it has been found to be positively related to psychological well-being (King & dela Rosa, 2019) and PTG (Orejuela-Dávila et al., 2019). In light of these processes, as expected, emotional suppression has shown a direct relationship with a higher level of distress during the pandemic (e.g., Bramanti et al., 2021), and cognitive reappraisal has been associated with a lower level of anxiety in people confined during the pandemic (e.g., Xu et al., 2020). It is likely that the circumstances of the pandemic have led to experiences and necessitated changes in students' lifestyles

that have generated high levels of distress accompanied by negative emotions. It appears that expressing these emotions instead of suppressing them and, as an alternative, considering a more acceptable meaning for the changes generated by the pandemic, can serve a potentially protective function in the face of COVID-19. The present results suggest the value of addressing and helping build healthy emotion regulation strategies as part of mental health interventions involving students subjected to high levels of stress. Helping them to access and express their emotions effectively and find an acceptable meaning for what is happening to them could reduce their levels of distress. In a similar vein, as others have articulated in other contexts (e.g., Greenberg et al., 2003; Kilmer et al., 2020), promotive strategies seeking to strengthen emotion regulation capacity can be part of system-, community-, or population-level policies and programming designed to build wellness from the start (see Cowen, 1994).

Social support can be conceived of as the feeling of being appreciated and valued by others and of belonging to a caring, helpful, and supportive social network, and a substantial body of research links such support to better quality of life, low psychological morbidity, and longer life (Barra, 2004). Its importance has been demonstrated by several studies that indicate, for example, that lack of social support is a risk factor for the onset of PTSD (Brewin et al., 2000). In that vein, McNally et al. (2003) emphasize that the vast majority of trauma survivors are able to recover without professional help, because they have good networks and prefer to confide in those close to them. These authors assert that a posttrauma supportive environment could reduce acute symptoms and the risk of developing PTSS. Social support has also evidenced a strong positive relationship with PTG in college students (Avilés et al., 2014). It may be that perceived social support, after a highly stressful event, decreases its cognitive impact and allows one to better regulate negative emotions, control dysfunctional behaviors, engage in distracting and rewarding activities, and better solve practical problems (Prati & Pietrantoni, 2009). This implies that promoting trauma-exposed students' attachment to their sources of social support, including family, friends, peers, and significant others, can help reduce the likelihood of developing PTSS and possibly foster PTG. Such efforts could be universal, pretrauma strategies, with the goal of building relevant social and emotional capacities that will facilitate positive relationships and adaptation (including in the face of adversity; see, e.g., Collaborative for Academic, Social, and Emotional Learning, 2012), or subsequent to a mass trauma event.

Several study limitations bear mention. The method used for the selection of participants in this study is a clear limitation, given that it involved an online survey and participants were not compensated for taking part. Thus, although the study sample is sizable, it is not representative of the population of Chilean higher education students more generally. It is possible that those who respond to online surveys may have different characteristics than those who do not, such as (a) better quality Internet or appropriate equipment to connect, which could relate to income level, or (b) sufficient cognitive resources available to take on completing the survey. Because it was not possible to assess for differences between those who chose to take part and those who did not, they may vary on variables key to this study, including their pandemic experience, their PTSS, and their experience of PTG. As such, study results and conclusions should be interpreted judiciously. Moreover, although the measures of PTSS and PTG were used as indicators of emotional distress and positive mental health and perceived benefits, it is not possible to frame these as posttraumatic responses in relation to the pandemic, because their potentially traumatic nature is under discussion (Bridgland et al., 2021) and the pandemic crisis has not yet ended. Furthermore, the present protocol was designed to minimize potential participant burden. It would have been strengthened by the inclusion of measures of other indicators of psychological functioning (e.g., depression and anxiety symptoms, life satisfaction) and well-being as well as additional potential predictors (e.g., hope, optimism, coping practices).

Notwithstanding those limitations, the present study establishes predictors of PTSS and PTG through a longitudinal study and, in turn, contributes to understanding regarding the psychological processes that lead to PTSS and PTG. Such work is necessary to inform strategies for promoting positive mental health and guiding clinical interventions aimed at preventing distress and helping facilitate the search for meaning and learning for those who have experienced significant adversities. The COVID-19 pandemic has had a negative impact on people's emotional well-being, and the virus itself as well as the manifold needed lifestyle changes have affected the school experiences and mental health of higher education students. A comprehensive mental health approach is needed—one that provides resources and supports to reduce discomfort, but also facilitates individuals' capacity to build skills, perceive learning, or foster positive personal experiences in the context of adversity.

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