

Feeling Down in Lockdown: Effects of COVID-19 Pandemic on Emotionally Vulnerable Individuals Ψ

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**Maria Panteli^{1,2}, Antonis Papantoniou¹,
Potheini Vaiouli^{1,2}, Chrysanthi Leonidou^{1,3} and
Georgia Panayiotou^{1,2}**

Abstract

We examined whether young adults with internalizing psychopathology during the pre-COVID-19 pandemic period exhibited different patterns of emotional responses than those without such psychopathology during the implementation of the “lockdown” in Cyprus, Greece. Two-wave longitudinal research was conducted in one hundred six college students completing measures of affective experiences, mental health, and quality of life during the prepandemic and lockdown periods. Increased negative affect and internalizing symptoms during the prepandemic period and decreased positive affect and increased perceived stress during the lockdown period both significantly predicted increased internalizing symptoms during the lockdown period. We discuss findings within the context of actions and interventions for young adults with existing internalizing symptomatology during the COVID-19 pandemic.

¹University of Cyprus,

²Center for Applied Neuroscience,

³Bank of Cyprus Oncology Center

Corresponding Author:

Corresponding Author: Maria Panteli Department of Psychology and Center for Applied Neuroscience University of Cyprus P.O. Box, 20537, 1678 Nicosia, Cyprus.

Email: mpante03@ucy.ac.cy

Keywords

COVID-19, negative affect, internalizing psychopathology, depression, college students

Significance of the Scholarship to the Public

The current study examined the emotional responses of college students with and without internalizing symptoms from before the COVID-19 pandemic lockdown period with predictors of internalizing symptoms during lockdown. College students experiencing heightened levels of negative affect and increased internalizing symptoms during the prepandemic period and low levels of positive affect and elevated levels of perceived stress during the lockdown period were at increased risk for experiencing more internalizing symptoms during the lockdown period. Our study informs policy makers, mental health workers, and universities regarding the actions that need to be taken during a pandemic in order to promote the mental health of college students.

The novel coronavirus disease 2019 (COVID-19) global outbreak was characterized as a pandemic by the World Health Organization (WHO) on March 11, 2020 (Cucinotta & Vanelli, 2020). In the absence of any vaccine or effective medicine, many countries adopted drastic measures in their effort to limit the spread of the “invisible enemy” (Panayiotou et al., 2021). Citizens saw their lives change radically overnight, as governments shutdown borders, schools, and businesses, forbade social and recreational events, and urged people to stay at home and keep social distance (Panayiotou et al., 2021; Panteli et al., 2021). In Cyprus, the first COVID-19 case was confirmed in March 2020 (Panayiotou et al., 2021). The government followed a strict route, with universities closing first and a general stay-at-home order following 10 days later. Cypriots spent nearly two months in quarantine, being allowed to leave their house only once per day for specific reasons.

Although the elderly and those with underlying diseases are considered to be at higher risk of serious health consequences from COVID-19, younger individuals and college students are also susceptible to the psychological effects of the pandemic, especially those who have experienced mental health issues in the past (Shanahan et al., 2020) and those who were struggling with psychological distress at the time of the pandemic (Mazza et al., 2020). Many psychological disorders including depression and schizophrenia appear in late adolescence or early adulthood (Chisolm, 1998; Perre et al., 2016), with one in five college students experiencing one or

more psychological disorders worldwide (Auerbach et al., 2016). Academic pressures, changes of lifestyle and housing, financial stress, difficulty accessing educational adjustments, and being away from significant others may cause and/or compound stress in this population (Carter et al., 2017), elevating their risk for negative mental health outcomes. Importantly, many students may fail to recognize psychological symptoms, as they expect to feel pressured by academic commitments (Gewin, 2012), and as a result normalize symptomatology and thus remain undiagnosed and untreated (Carter et al., 2017). Even though feelings of worry and uncertainty are expected and common during a crisis like the pandemic, individuals who are at risk for internalizing problems need special attention by policy makers, psychologists, and other mental health workers (Holmes et al., 2020).

Studies conducted in several countries including China (Wang et al., 2020), the United States (Son et al., 2020), Italy (Mazza et al., 2020), Spain (Losada-Baltar et al., 2020), France (Husky et al., 2020), and the United Kingdom (Groarke et al., 2020) indicated elevated negative feelings in younger individuals and college students during the pandemic. Such psychological states may have been due to the closure of universities, the postponing of in-campus activities, and the mandatory quarantine and mobility restrictions, which reduced students' socialization. Potential concerns of college students included how the duration of the pandemic would affect their studies and graduation, the inability to complete research projects, and the abrupt switch to online modalities of learning (Zhai & Du, 2020). Additionally, the greater access that younger individuals have to online information can easily lead to an "overdose" of threat-related information, heightening the fear of potential contagion of the virus from/to others, worries about the social stigma that accompanies transmission, and the financial uncertainty caused by the closure of businesses (Zhai & Du, 2020). All of the above, in combination with the limited access to mental health professionals due to social distancing and mobility restrictions, constituted significant stressors during the pandemic period for college students and younger individuals (Zhai & Du, 2020). Individuals with preexisting mental health issues (Brooks et al., 2020; Holmes et al., 2020; Shanahan et al., 2020) and with symptoms during the implementation of lockdown and quarantine measures (Mazza et al., 2020) may have been more vulnerable to these stressors. These stressors came to complicate an already challenging developmental period, characterized by the transition to adulthood and independent living.

Internalizing psychopathology typically refers to anxiety and depression symptoms, which are very often comorbid (both concurrently and sequentially), and is defined as the tendency to experience feelings and states that are inner-directed and usually accompanied by over-controlled behaviors (Griffith et al., 2010; Lamers et al., 2010). Prior work has established that internalizing

symptomatology is accompanied by high negative affect and low positive affect and negatively influences social relations, quality of life (QoL), and family, work, and academic responsibilities (Belmaker & Agam, 2008; Brenes, 2007; Griffith et al., 2010). To our knowledge, no previous study has examined whether young adults with existing internalizing psychopathology before the implementation of lockdown measures exhibited different patterns of affective responses during the COVID-19 pandemic relative to the prepandemic period, including differences in positive and negative affect and psychological well-being, through a longitudinal design. Further, no prior work has examined whether emotional responses and preexisting internalizing symptomatology prepandemic are associated with internalizing symptomatology during the implementation of lockdown and quarantine measures.

Considering the possible psychological costs and the uncertainty around the duration of the COVID-19 crisis worldwide, the goal of this paper was to provide preliminary evidence on the vulnerability of individuals with existing internalizing symptomatology during the prepandemic period, with regard to levels of perceived stress, subjective QoL, and changes in positive and negative affect, during the implementation of lockdown measures, through a two-wave longitudinal study. The study also examined predictors of internalizing symptoms during lockdown among college students. We hypothesized that:

- 1) Given the changes that COVID-19 induced in the lives of college students, and world-wide findings supporting increased prevalence of internalizing problems during the COVID-19 pandemic relative to the prepandemic period (Ettman et al., 2020), there would be an increase of psychopathology from prepandemic period to lockdown in college students.
- 2) Individuals with internalizing psychopathology during the prepandemic period (preexisting psychopathology) would show greater decline in positive affect and quality of life compared to a control group of individuals without internalizing psychopathology.
- 3) Individuals with internalizing psychopathology during the prepandemic period would exhibit greater increases in negative affect and higher perceived stress during the lockdown period compared to the control group.
- 4) Given existing knowledge about the association between internalizing psychopathology with reduced positive affect and increased negative affect (Anthony et al., 2002), we predicted that increased negative affect and decreased positive affect (both during the prepandemic period and during the lockdown period), and increased perceived stress during the lockdown period, along with preexisting internalizing symptomatology would predict increased internalizing symptomatology during the lockdown period.

Method

Participants

One-hundred and six Greek Cypriot undergraduate university students (82.1% females; $M_{age} = 21.60$, $SD = 3.43$ years) took part in the current study in exchange for extra course credit for psychology classes or inclusion in a prize-drawing. Of note, the majority of our participants were female college students compared to male ones. Participants were drawn from a larger project examining the associations between personality, mental health problems, and emotion regulation that received approval from the Cyprus National Bioethics Committee.

Measures

Psychiatric and Diagnostic Screening Questionnaire. This 126 item-questionnaire is divided into 13 subscales assessing symptoms of several Diagnostic and Statistical Manual of Mental Disorders IV Axis I disorders (Zimmerman & Mattia, 2001), and it was completed by participants at both Time 1 (T1; during prepandemic period) and Time 2 (T2; during lockdown). Internalizing symptoms were measured through the depression, panic disorder, generalized anxiety disorder, and agoraphobia subscales of the Psychiatric and Diagnostic Screening Questionnaire (PDSQ; Zimmerman & Mattia, 2001). In the current study, internalizing psychopathology refers to those meeting the criteria of at least one anxiety disorder, including panic disorder (cutoff score = 4), generalized anxiety disorder (cutoff score = 7), and agoraphobia (cutoff = 4), or depression (cutoff score = 9) or both anxiety and depression disorders based on the clinical cutoff scores of the PDSQ and in accordance with the relevant literature (Griffith et al., 2010; Lamers et al., 2010). The PDSQ has shown good psychometric properties with Cronbach's α being greater than .80 for 12 of the 13 subscales, the measure also demonstrates good discriminant, convergent, and concurrent validity (Zimmerman & Mattia, 2001). The PDSQ showed high internal consistency and validity in Greek, with a mean convergent validity of ($r = .66$; e.g., Karekla et al., 2012; Theodorou et al., 2013). In the current study, included subscales showed good internal consistency with Cronbach's α ranging between .77–.88. Sample items for the anxiety subscale, assessing symptoms over the past month, included: "Did you often have difficulty concentrating because your mind was on your worries?" and "Did you often feel tension in your muscles because of anxiety or stress?" For the depression subscale, sample items included: "Did you feel sad or/and depressed?" and "Did you feel exhausted almost everyday?"

World Health Organization Quality of Life-BREF

The World Health Organization Quality of Life-BREF (WHOQoL-BREF) is a 26-item questionnaire, a brief version of the 100-item WHOQoL measure, was used to assess subjective QoL prepandemic and during lockdown (WHOQOL Group, 1996). Sample items were the following: physical health, “For the last month, did you need medical treatment to function in your daily life?”; psychological health, “For the last month, did you feel that your life had meaning?”; social relationships, “For the last month, how satisfied are you with the support you received from your friends?”; environmental quality of life, “For the last month, how safe was your physical environment?” Given that each subscale measures different dimensions of QoL that may have been affected differently by the COVID-19 pandemic, the analyses were performed for both total QoL and each domain of QoL separately. WHOQoL-BREF showed good psychometric properties, including good discriminant and content validity (WHOQOL Group, 1998). A Greek validation study showed similar findings for the WHOQoL-BREF, in which this instrument showed good convergent ($r = .78$ with Life Satisfaction Inventory) and discriminant validity among mentally and physically ill patients ($p < .001$; Ginieri-Coccossis et al., 2009). In this study, Cronbach’s α for QoL for T1 and T2 was .91 and .93, respectively.

Positive Affect and Negative Affect Schedule

The Positive Affect and Negative Affect Schedule (PANAS) developed by Watson et al. (1988) was used to measure participants’ positive and negative affect prepandemic and during the lockdown. It involves two subscales, positive and negative affect (10 items each), rated on a 5-point Likert-type scale from 1 (*very slightly or not at all*) to 5 (*extremely*). Participants rated the extent to which, over the last month, they often felt several pleasant or unpleasant emotions, such as interested, excited, stressed, upset, and afraid. The PANAS has demonstrated high internal consistency, with Cronbach’s α ranging between .84–.90 (Watson et al., 1988) and good construct validity based on the results of confirmatory factor analysis (RCFI = .94, RMSEA = .058, SRMR = .052; Crawford & Henry, 2004). In our sample, Cronbach’s alpha reliabilities for the two subscales across T1 and T2 ranged between .82–.92.

Perceived Stress Scale

The Perceived Stress Scale (PSS) assessed general stress and how uncontrollable and unpredictable participants found their lives to be during the lockdown period (Cohen et al., 1983). The PSS involves 10 items rated on a 5-point Likert-type scale from 0 (*never*) to 4 (*very often*). The PSS has

demonstrated good construct (CFA results: CFI = .945, RMSEA = .065, SRMR = .041) and convergent validity (through comparisons with Depression Anxiety and Stress Scale-21, in the Greek language, $r = .64$ Andreou et al., 2011). In the original study, the PSS showed high reliability ranging between .84–.86, likewise Cronbach's α for our study was .79, supporting good psychometric properties. Sample items were "In the last month, how often have you felt upset by something happening unexpectedly?" and "In the last month, how often have you been effectively coping with important changes that were occurring in your life?"

Procedure

The first phase (T1) was conducted nine months (May–June 2019) before the WHO declared the COVID-19 pandemic on March 11, 2020. During T1, participants completed questionnaires on QoL (WHOQoL-BREF), mental health (PDSQ), and positive and negative affect (PANAS) through the LimeSurvey online platform. The second phase (T2) was conducted about one month into the implementation of the first lockdown (mid April–early May) and spanned through the first steps of easing of the measures announced by the Cypriot authorities (i.e., during T2, participants were allowed to leave the house 1–3 times daily, through text notification). During T2, participants completed the same instruments as in T1, but also a questionnaire about perceived stress (PSS), they were asked to respond based on their experiences during the last month, without explicitly mentioning the pandemic.

Plan of Analyses

The statistical package SPSS 25 for Windows was used to analyze data. Initially, we used international cutoff scores for depression and anxiety disorders based on the PDSQ to split our sample into those with and without internalizing psychopathology. Secondly, Pearson's r correlations were conducted among study variables measured during the prepandemic period with the corresponding variables during the lockdown period to establish the test–retest reliability of these measurements and identify the associations among constructs. Repeated measures analysis of variances (RANOVAs) were conducted between internalizing symptoms during the prepandemic period and lockdown period to assess potential changes. For the main analyses, RANOVAs were conducted to (a) examine changes in positive affect, negative affect, and QoL from the prepandemic to the lockdown period and (b) to examine if these changes interacted with clinical status during the prepandemic period: Specifically, a RANOVA was conducted with only time phase (e.g., positive affect prepandemic vs. positive affect during lockdown) as the within factor and group category during the

prepandemic period (internalizing symptomatology group vs. control group) as the between factor. The same type of RANOVA was conducted for each of the remaining mental health indices (negative affect, QoL, and QoL subscales) with time phase (prepandemic, during lockdown) as the within factor and group category during the prepandemic period (internalizing symptomatology group vs. control group) as the between factor, in separate analyses. We also examined with independent samples *t*-test the differences between participants with and without internalizing psychopathology during the prepandemic on perceived stress during the lockdown. Furthermore, a multiple linear regression was conducted with positive and negative affect during the prepandemic period and the lockdown period, perceived stress during the lockdown period, and preexisting internalizing symptoms as the predictors and internalizing symptoms during the lockdown as the dependent variable, in order to examine which affective responses predicted internalizing symptomatology during lockdown.

Results

Description of the Groups

International cutoff scores for depression and anxiety disorders based on the PDSQ were used to split our sample into those with and without internalizing psychopathology (Ciuca et al., 2011). Based on these cutoff scores, 38 participants (26 females, 12 males) met the criteria for at least one of the aforementioned internalizing disorders during the prepandemic period (internalizing psychopathology group), whereas 68 participants (61 females, 7 males) did not meet the cutoff criteria (control group) during the same period. Participants in the internalizing group during the prepandemic period did not differ from the control group with respect to age $t(104) = 1.11, p = .269$, but they differed in gender composition $t(54.84) = -2.51, p = .015$.

Correlations Among Study Variables Prepandemic and During Lockdown

As expected, significant correlations were observed among internalizing symptoms, positive affect, negative affect, and QoL during the prepandemic period and during lockdown, and also between measurements of prepandemic and lockdown (see Table 1). Of note, internalizing symptoms during both the prepandemic and lockdown periods were positively correlated with negative affect and negatively correlated with positive affect and QoL, although these associations during lockdown were stronger than during the prepandemic period. These findings support that measurements were both valid and stable over time.

Internalizing Symptoms Prepandemic and During Lockdown

No significant differences were observed between the number of internalizing symptoms during the prepandemic period, with those reported during the lockdown period supporting stability of internalizing symptomatology, Wilks' Lambda = 0.999, $F(1, 105) = 0.94$, $p = .760$, $\eta_p^2 = .001$.

Positive and Negative Affect During Prepandemic Versus During Lockdown and Effects of Clinical Group

RANOVAs indicated a main effect of time on positive affect in the expected direction, in other words, a decrease from prepandemic to lockdown (prepandemic positive affect: $M = 35.33$, $SE = 0.74$, lockdown period positive affect: $M = 30.68$, $SE = 0.99$), Wilks' Lambda = 0.849, $F(1, 104) = 18.56$, $p < .001$, $\eta_p^2 = .151$. The Time Phase x Group interaction was not significant, Wilks' Lambda = 0.999, $F(1, 104) = 0.78$, $p = .781$, $\eta_p^2 = .001$, showing that those with and those without internalizing pathology did not differ in the changes to their positive affect. Further, there was a nonsignificant main effect of time on negative affect, Wilks' Lambda = 0.994, $F(1, 104) = 0.58$, $p = .447$, $\eta_p^2 = .002$, and no significant Time Phase x Group interaction, Wilks' Lambda = 0.971, $F(1, 104) = 2.11$, $p = .081$, $\eta_p^2 = .029$, suggesting that clinical group membership at the prepandemic period did not affect changes in negative affect. Notably, emotional changes from prepandemic to lockdown involved a decrease in positive affect but no significant change in negative affect.

Quality of Life Prepandemic Versus During Lockdown and Effects of Clinical Group

From the total pool, sixteen participants were excluded from this analysis due to incomplete questionnaires. Although a significant main effect of time phase on participants' QoL was observed, with QoL reduced at T2 versus T1, Wilks' Lambda = 0.937, $F(1, 86) = 5.83$, $p = .018$, $\eta_p^2 = .063$, the Time Phase x Group interaction was not significant, Wilks' Lambda = 1.000, $F(1, 86) = 0.001$, $p = .982$, $\eta_p^2 < .001$. Similarly, although a significant main effect of time phase on participants' quality of physical health, Wilks' Lambda = 0.844, $F(1, 86) = 15.93$, $p < .001$, $\eta_p^2 = .156$, and psychological health was observed, Wilks' Lambda = 0.95, $F(1, 86) = 4.48$, $p = .037$, $\eta_p^2 = .05$, with decreases in physical and psychological health from T1 to T2, the Time Phase x Group interaction was not significant neither for quality of physical health, Wilks' Lambda = 0.996, $F(1, 86) = 0.35$, $p = .553$, $\eta_p^2 = .004$, nor for quality of psychological health, Wilks' Lambda = 1.00, $F(1, 86) = 0.01$, $p = .918$, $\eta_p^2 < .001$, suggesting that QoL did not change differently for participants with and

Table 1. Correlations Pearson *r* Among Internalizing Symptoms, Positive Affect, Negative Affect, Quality of Life Prepandemic and During Lockdown, and Perceived Stress During Lockdown

Variables	1	2	3	4	5	6	7	8	9
1. Internalizing symptoms prepandemic	—								
2. Positive affect prepandemic	-.36**	—							
3. Negative affect prepandemic	.43**	-.12	—						
4. Quality of life prepandemic	-.59**	.64**	-.21*	—					
5. Internalizing symptoms lockdown	.60**	-.22*	.21*	-.51**	—				
6. Positive affect lockdown	-.23*	-.39**	-.21*	.34**	-.49**	—			
7. Negative affect lockdown	.54**	-.19*	.48**	-.33**	.52**	-.22*	—		
8. Quality of life lockdown	-.42**	.40**	-.31**	.66**	-.66**	.74**	-.34**	—	
9. Perceived stress lockdown	.40**	-.14	.22*	-.32*	.71**	-.55**	.56**	-.63**	—

Note. **p* < .05, ***p* < .001.

without internalizing pathology before the pandemic. Time phase did not have a significant main effect on participants quality of social relationships, Wilks' Lambda = 1.00, $F(1, 86) = 0.01$, $p = .929$, $\eta_p^2 < .001$, or quality of environment, Wilks' Lambda = 0.997, $F(1, 86) = 0.30$, $p = .586$, $\eta_p^2 = .003$, whereas the Time Phase x Group interaction was not significant either for quality of social relationships, Wilks' Lambda = 1.00, $F(1, 86) = 0.01$, $p = .929$, $\eta_p^2 < .001$, or for quality of the environment, Wilks' Lambda = 1.00, $F(1, 86) = 0.03$, $p = .871$, $\eta_p^2 < .001$.

Perceived Stress Prepandemic Versus During Lockdown and Effects of Clinical Group

Because perceived stress was measured only during lockdown, group effects were examined only during this measurement time with t tests rather than RANOVAS. Based on independent-samples t test, individuals with internalizing psychopathology during the prepandemic period exhibited greater perceived stress during lockdown ($M = 19.40$, $SD = 5.61$) than those without internalizing psychopathology ($M = 14.83$, $SD = 5.53$; $t(104) = -4.03$, $p < .001$).

Affective Responses as Predictors of Internalizing Psychopathology During the Lockdown Period

Partially consistent with our hypotheses, preexisting internalizing symptoms, increased negative emotions during the prepandemic period, and perceived stress during the lockdown period positively predicted internalizing symptomatology during lockdown, whereas positive emotions during the lockdown period negatively predicted internalizing symptomatology at the same period (see [Table 2](#)). No other significant associations were observed between emotional responses and internalizing symptomatology during the lockdown period.

Discussion

The current study examined whether the stressors associated with the COVID-19 pandemic, like lockdowns and other behavioral and social restrictions imposed by the Cypriot government, resulted in greater impairment to the well-being of young adults who had internalizing psychopathology during the prepandemic period compared to those without internalizing psychopathology. Although participants reported decreased positive emotions, QoL, and psychological QoL from the prepandemic to the lockdown period, no significant differences were observed between the internalizing psychopathology group and the control group, when examining the effect of pre-existing internalizing

Table 2. Summary of Multiple Regression Analysis for the Associations Between Internalizing Symptoms During the Lockdown Period and Emotional Responses

Variables	<i>B</i>	<i>SE B</i>	<i>Standardized Beta</i>	<i>T</i>	<i>p</i>
Pre-existing internalizing symptoms	0.41	0.08	0.41	5.36	< .001
Prepandemic positive affect	0.09	0.09	0.07	0.97	.333
Prepandemic negative affect	−0.24	0.11	−0.16	−2.29	.024
Lockdown positive affect	−0.19	0.09	−0.18	−2.26	.026
Lockdown negative affect	0.19	0.12	0.14	1.62	.108
Lockdown perceived stress	0.65	0.13	0.42	4.83	< .001
<i>R</i> ²	0.664				
<i>F</i>	32.54				

pathology in RANOVAs. Also, internalizing symptoms remained overall stable from pre- to postpandemic, showing that this crisis did not significantly increase the likelihood of college students acquiring a diagnosis that they did not previously have, suggesting overall resilience in this population. Levels of negative emotions did not differ from the prepandemic to the lockdown period, and the clinical group did not moderate this outcome.

The flip side of this picture of relative resilience is that previous internalizing pathology remained persistent several months after their first assessment. Another longitudinal study has shown greater persistence of internalizing symptoms in individuals who exhibited both anxiety and depression problems (Gao et al., 2020); in our sample too, more than half of the participants who met the criteria for internalizing disorders exhibited both depression and at least one anxiety disorder, as well as a persistence of their symptoms throughout the pandemic. Gao et al. (2020) suggested that the stability of students suffering from internalizing symptoms may be due to less use of or access to mental health services and a lack of perceived need and requests for help (Zivin et al., 2009); therefore, students may remain undiagnosed, untreated (Carter et al., 2017), and without help from significant others. This is an issue for universities to consider, irrespective of the pandemic circumstances, in order to identify and assist students with mental health difficulties. However, other factors may also contribute in the stability of internalizing symptoms during the COVID-19 pandemic, such as temperament (e.g., neuroticism), changes in life-style (e.g., difficulties applying behavioral activation actions), and lack of face-to-face personal contact with friends. Further studies are needed in order to clarify which factors contribute to the persistence of these symptoms under such circumstances.

Consistent with our hypothesis, however, college students with internalizing symptoms during the prepandemic period reported increased perceived stress during the lockdown compared to college students in the control group,

with the latter showing similar levels of perceived stress, as reported in past studies conducted before the pandemic (Cohen et al., 1983; Panayiotou & Karekla, 2013). Also, when considering all affective responses both before and during lockdown as predictors of internalizing symptoms during the pandemic, increased negative emotions and internalizing symptoms during the prepandemic period and decreased positive emotions and increased perceived stress during lockdown predicted more internalizing symptoms during this period, suggesting that indeed prepandemic poor psychological status was associated with worse outcomes during the pandemic. Although this finding is not surprising (i.e., that past psychological distress in the form of internalizing symptoms, negative affect predominance, and increased perceived stress were the strongest predictors of T2 internalizing symptoms), results are consistent with our hypothesis that college students with greater preexisting psychological difficulties and experiencing increased unpleasant emotions during the prepandemic period merit more attention from mental health workers than college students without such difficulties, as they tend to experience greater internalizing symptoms during the pandemic and thus increased dysphoria.

The decline in positive affect from prepandemic to lockdown, even though it was not modulated by clinical group status, is an important finding. Limited pleasant feelings motivate individuals to initiate actions to bounce back, reinstate their environment to its state before the crises, and inform them about important personal needs and values (Reeve, 2009). It is thus not surprising that both groups experienced less positive emotions during the lockdown period, as all students experienced significant, unexpected, and unwanted life changes. However, the notable difference between those with, and those without, internalizing pathology is that youth with internalizing problems showed increased perceived stress during the lockdown compared to youth without such problems. In turn, increased perceived stress during lockdown predicted increased internalizing symptoms at the same period, suggesting a path toward more distress during the pandemic period for this subgroup, based on high levels of perceived stress. Feelings of stress, fear, worry, and uncertainty are expected and common during crises, as individuals interpret the situations as threatening and dangerous for their well-being and survival (Reeve, 2009). Such feelings warn people about their vulnerability, motivate defensive actions and increased hypervigilance, facilitate active coping (e.g., hand washing etc.), and thus serve a protective role (Ornell et al., 2020). However, disproportionate emotions to the circumstances that one encounters, such as extreme perceived stress and limited pleasant feelings, hinder adaptation and survival and become harmful (Berenbaum et al., 2003; Panayiotou et al., 2019; Shin & Liberzon, 2010). On these grounds, it can be tentatively hypothesized that high perceived stress during the lockdown promoted coping that was rigid and nonadaptive (e.g., extreme

hypervigilance, reduced communication with others), resulting in experiencing more internalizing symptoms. Thus, even though increased stress and decreased positive emotions are essential for adjustment to the COVID-19 crisis, disproportionate changes in the levels that were not analogous to the circumstances (especially during a period when people were relatively safe in their shelters) may have resulted in impoverished well-being for students, especially those with pre-existing mental health issues.

Limitations

The present study has some limitations. Our sample was relatively small, with a greater proportion of women than men, and consisted only of undergraduate students. However, given the lack of longitudinal studies examining the effects of COVID-19 from the prepandemic period to the lockdown period, it provides significant information about changes in emotional responses during this period and guides clinicians regarding the vulnerable populations that should be the center of interventions under such circumstances. Additionally, even though our sample was from a small European country, it can provide insights on how the pandemic affected individuals from different cultural backgrounds other than the United States and China, where most of the current research on COVID-19 has focused. Further, the PSS scale was not included in the first stage of the study, and thus no information is provided regarding changes in perceived stress. Nevertheless, even with a single measurement, we were able to observe that college students without internalizing psychopathology during the prepandemic period showed similar levels of perceived stress as reported in past studies conducted before the pandemic (Panayiotou & Karekla, 2013), whereas those with internalizing psychopathology exhibited increased levels of perceived stress, suggesting that they suffered more during the COVID-19 pandemic. Additionally, even though our study was based on self-report, and thus participants' responses may have been influenced by social desirability bias, this method gave participants the opportunity to describe their own experiences rather than having researchers observe and interpret these experiences, in line with the purpose of this study.

Implications for Practice, Advocacy, Education/Training, and Research

Overall, our results can be helpful to policy makers and mental health workers who can direct their future efforts and resources to protecting and caring for vulnerable groups, rather than on population-wide programs. Under such crises, clinicians and researchers should set as a priority the development of

interventions targeting the reduction of unpleasant feelings and stress in individuals known to have experienced increased negative emotions and internalizing symptoms during the prepandemic period (i.e., past clients, students utilizing university counseling centers).

Based on our findings, it appears that approaches that target the increase of positive feelings and the reduction of stress during crises may be particularly helpful in reducing internalizing symptoms and improving QoL during lockdown (and potentially during other crises) in college students. Specifically, acceptance- and awareness-based coping and mindfulness could help young individuals, especially those with persistent internalizing symptoms and negative affect, increase their tolerance for the affective impact of crises, and decrease their perceived stress. Such interventions are in line with our recent findings supporting that difficulties in emotional awareness and in communicating emotions negatively predicted QoL during the lockdown period in college students (Panayiotou et al., 2021). Additional interventions targeting the development of distress tolerance skills such as a brief dialectical behavior therapy have shown promising outcomes in regulating unpleasant feelings in college students through increasing the use of adaptive emotion regulation strategies (Muhomba et al., 2017). Disclosure through expressive writing could also have therapeutic outcomes by facilitating comprehension of experiences and perceived stress reduction (Pennebaker, 1997). Interventions targeting the development of self-compassion have been shown to be effective in protecting individuals from stressful events by promoting positive self-feelings when life goes badly, having a buffering effect against negative self-feelings (Leary et al., 2007). A recent meta-analysis indicated that cognitive behavioral therapy (CBT) interventions, targeting the development of coping skills, and the provision of social support are effective in reducing perceived stress in college students (Yusufov et al., 2019), and may also prove to reduce perceived stress during the COVID-19 pandemic.

Interventions focusing on increasing the positive affect of college students are also important and can facilitate the process of bouncing back from unpleasant emotional experiences, like those experienced during crises (Fredrickson et al., 2003; Tugade & Fredrickson, 2004). Even in difficult situations like quarantine, behavioral activation through engaging in pleasurable activities might combat psychological distress (Polizzi et al., 2020). During the implementation of lockdown and quarantine measures, young individuals with increased internalizing symptoms may benefit from efforts to refocus on their personal values, set meaningful goals, and act in accordance with these values and goals (Goodman et al., 2018), as well from attempts to normalize their stressful experiences (Reich, 2006). Bono et al.'s (2020) findings showed that grit and gratitude interventions may protect the subjective well-being of college students. In line with this, meta-analyses supported that positive psychology interventions are effective in improving well-

being in both clinical and nonclinical samples (Chakhssi et al., 2018; Sin & Lyubomirsky, 2009). Similarly, CBT has been effective in improving QoL (especially psychological QoL) and life satisfaction in individuals with internalizing mental health problems (Hofmann et al., 2014; Oei & McAlinden, 2014), and thus it may be promising for college students with lower levels of QoL during the COVID-19 pandemic.

Telehealth mental health services are more feasible and acceptable rather than in-person interventions due to the mobility restrictions that COVID-19 induced in people's lives, and existing evidence indicates that they constitute an effective mode of service delivery (Reay et al., 2020) that can be used to provide most of the previously described types of interventions. For instance, internet-delivered CBT has been as effective as clinician-delivered CBT for several mental and physical health problems (Bonnert et al., 2017; Carlbring et al., 2018). An internet-based self-help intervention including breathing and mindfulness has also been effective in improving depression and anxiety symptoms in inpatients with COVID-19 and moderate psychological distress (Wei et al., 2020), such interventions also improve the QoL of individuals with physical health problems (Larson et al., 2020). Thus, these types of mental health services can have an important role in the reduction of unpleasant feelings and perceived stress as well as the enhancement of positive feelings and QoL of college students, especially during a period when many campuses remain closed, and can contribute in the prevention of internalizing symptoms.

Based on our outcomes, the changes that COVID-19 induced in the lives of college students, such as the closure of universities, the uncertainty around how this crisis will affect their studies and graduation, and the sudden switch to online teaching, resulted in students experiencing reduced positive affect and increased perceived stress. Under such circumstances, teachers need to provide reassurance to students about the arrangements that will be made for canceled exams, modify assessment procedures, and combat misinformation through frequent communication and the dissemination of accurate information (Daniel, 2020; McCutcheon et al., 2020). Further, they can provide students with help lines, and other resources, including how they can access the mental health center at their university or give them website links that specialize in addressing psychological difficulties (Daniel, 2020; McCutcheon et al., 2020). During this phase, teachers should be flexible and attempt to maintain students' interest for learning through several activities, such as giving them varied assignments in accordance with their interests so as to keep them behaviorally active with pleasant actions rather than orient their focus on traditional classroom curriculum and assessments or examinations (Daniel, 2020). Such steps can contribute in the enhancement of positive feelings and the reduction of perceived stress and thus the prevention of associated internalizing symptoms.

At the same time, our findings inform universities on the decisions and actions that need to be taken during COVID-19, and similar crises, in order to promote the mental health of their students. First of all, they need to make the transition to online learning for both the teachers and students easier, so as to reduce their anxiety about the sudden changes in their courses' delivery method (McCutcheon et al., 2020). Administrators should promote through media and press-releases information about the measures that students should take, the measures that the university takes, and the current situation in their country, and address any misinformation that may exist in the public based on scientific findings so as to reduce their subjective stress. Information should also be provided regarding resources that could help students cope with this crisis. In addition, universities could offer psychological services oriented and adapted to the needs of college students during the COVID-19 pandemic. In line with our findings, trainings about how to improve their quality of life during the COVID-19 pandemic, experience more positive emotions, and cope with perceived stress through group-based trainings using teletherapy seem promising to mitigate internalizing symptoms in this population.

Apart from measures to promote better mental health in this population, research is needed to understand which factors contribute in the stability of internalizing symptoms and which factors contribute in the development of internalizing symptoms under such crises in individuals with an unknown history of such difficulties. For instance, specific temperaments such as harm avoidance, anxiety sensitivity, or neuroticism; skills such as emotion regulation or interpersonal conflict skills; life changes such as living alone without face-to-face contact with important others; and not being able to apply important value actions and/or feelings such as loneliness or uncertainty about the future may contribute in experiencing increased internalizing symptoms during the COVID-19 pandemic and similar crises and vice versa. Further research is also needed on the intermediate and long-term impact of the pandemic on college students in relation to their psychological health, academic life, and professional status.

Conclusion

Overall, the current study informs researchers and clinicians about which college students should be the focus of their attention in a crisis. Actions targeting the relief of negative emotions in individuals with a known history of experiencing increased internalizing symptoms and negative affect, and the increase of positive emotionality and decrease of perceived stress in college students showed significant reductions in positive emotions and elevated levels of perceived stress seem promising to prevent the associated internalizing symptomatology during the COVID-19 crises and implementation of measures restricting people's mobility. Such interventions could help youth

with increased risk for mental health symptoms to bounce back from the emotional stress caused by a crisis situation.

Author's Note

Data used in this manuscript are available from the corresponding author upon request.

Author Contribution

M.P., G.P., and A.P. conceived and designed the study, and developed the theoretical part. M.P. performed the statistical analyses. M.P. and A.P. wrote the first draft of the manuscript in consultation with G.P., C.L., and P.V. G.P. supervised the project. All authors discussed the findings, provided critical feedback, and helped shape the final version of the manuscript.

Declaration of Conflicting Interests

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Ethical Approval

All procedures performed in this research involving human participants were carried out in accordance with the ethical standards of the Cyprus National Bioethics Committee and the 1964 Helsinki declaration, its later amendments, or comparable ethical standards (World Medical Association, 2013).

Informed Consent

Informed consent was obtained from all participants, prior to both the first and the second stage of the study, separately.

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Author Biographies

Maria Panteli, MSc, MA, holds a BA in psychology and two masters degrees in cognitive and educational psychology (University of Cyprus) and in research methods in psychology (University of Surrey, UK), and currently is a PhD student in clinical psychology at the University of Cyprus. Her research interests are in the area of emotion processing and regulation through the use of subjective, expressive and physiological measurements.

Antonis Papantoniou, BA, holds a bachelor degree from the department of psychology of University of Cyprus. He is currently a postgraduate student in the master's program of applied school psychology of the department of psychology in the University of Cyprus.

Potheini Vaiouli, PhD, is a special scientist for research at the Centre for Applied Neuroscience, University of Cyprus. Her research interest, which emerge from her background in music therapy and special education, converge around music and its role in the social and emotional development of young children with autism and their families.

Chrysanthi Leonidou, PhD, is a clinical psychologist currently working in an oncology hospital. She conducts research in collaboration with the Clinical Psychology and Psychophysiology lab at the University of Cyprus. Her main research interests focus on the affective mechanisms involved in health anxiety.

Georgia Panayiotou, PhD, is professor of clinical psychology at the University of Cyprus, holding a PhD from Purdue University. Her research focuses on emotions and their regulation and their role in psychopathology, mainly anxiety, alexithymia, antisocial disorders and addictions, using self-report and psychophysiological methods.