

RESEARCH ARTICLE

# Some Predictors of University Students' Subjective Well-Being in Croatia During The COVID-19 Pandemic

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**Introduction:** Changes caused by the COVID-19 pandemic significantly altered the functioning of different social systems, including the educational one. Closing educational institutions and transferring the educational process to online platforms posed new challenges for students' academic functioning and well-being in these unexpected circumstances.

**Aims:** This study aimed to explore the role of university students' academic functioning and personality in predicting their subjective well-being during the online studying implemented in Croatia due to the pandemic caused by the coronavirus.

**Methods:** A sample of 505 university students from different Croatian faculties participated in the online survey, which included their ratings of adjustment to the online learning environment, related difficulties in learning and self-regulation, perception of the online education's quality, the level of life disruption caused by the pandemic, personality traits, and subjective well-being measures (life satisfaction, positive affect, and negative affect).

**Results:** Results generally revealed that certain aspects of students' academic functioning during online studying as well as their personality explained a significant proportion of the subjective well-being measures' variance. Also, the perceived level of life disruption caused by the pandemic and neuroticism were the strongest predictors of students' subjective well-being, followed by extraversion and conscientiousness.

**Conclusions:** Obtained results indicate that some aspects of academic functioning upon the transition to online studying could contribute to students' subjective well-being and should be considered when planning interventions to increase their well-being and enhance the quality of the online learning environment in these challenging times.

**Keywords:** COVID-19 pandemic, university students, subjective well-being, online studying, personality

## Introduction

The pandemic caused by COVID-19 significantly changed the usual worldwide lifestyle and posed new challenges for all social systems, including the educational one. One of the measures aimed at reducing social interactions in many countries, including Croatia, was closing educational institutions and transferring the onsite educational process to various online platforms both in schools and universities. The Government of the Republic of Croatia introduced these measures and the Civil Protection Headquarters (Government of the Republic of Croatia, 2020–2021) coordinated them. After the first pandemic wave, schools in Croatia – depending on pupils' age and the disease incidence in specific country regions – are partially open in coordination with the Ministry of Science and Education (2020–2021). At the same time, most higher education institutions remained in an online environ-

ment. Although at the beginning of the academic year 2020/2021, many faculties in Croatia tried to organize an acceptable form of onsite education in line with recommendations by the Croatian Institute of Public Health (2020), for most of them, this practice lasted very briefly. Namely, the second pandemic wave in the fall restored most of the higher education processes online throughout the academic year. Currently, Croatia is facing another unpredictable academic year due to strong indicators of the fourth pandemic wave since the numbers of newly confirmed cases in Croatia at the end of October 2021 are about the same as they were at the peak of the second pandemic wave in December 2020 (Government of the Republic of Croatia, 2021). This new reality implied fast adjustment from both educators and students to a relatively new practice (Almendingen et al., 2021; Aristovnik et al., 2020; Means et al., 2020), and the effects of these changes understandably came into the focus of researchers from various disciplines, along with the substantial increase in the number of related studies. Interest in this field becomes even more prominent considering that the pandemic and measures aimed at social distancing have lasted longer than a year and a half, and these measures can influence students' mental health (Son et al., 2020; Živčić-Bećirević et al., 2021). Hence, it seems that this pandemic has become a protracted crisis and the world is facing uncertainty about its ending due to the new virus mutations and the prolonged initial vaccination plans in many countries, including Croatia (Ritchie et al., 2021). This protracted crisis can reflect on different societal and individual levels, posing the question of its current and subsequent effects.

Various changes in everyday routines caused by the pandemic can also influence students' subjective well-being and can be associated with various mental health problems among college and university students, such as depression, anxiety, and stress (Batra et al., 2021; Cao et al., 2020; Chaturvedi et al., 2021; Elmer et al., 2020; Živčić-Bećirević et al., 2021). These reactions are assumed to be a common psychological response to the pandemic among individuals from different groups (Rajkumar, 2020). Considering the salience of the educational process for students, it seems plausible that their functioning in the online learning environment could contribute to their subjective well-being. Current studies also imply that university students' self-regulation and personality could play a significant role in adjustment to the new learning environment; i.e., online studying (Bao, 2020). Literature indicates that studies addressing psychological trajectories during the pandemic predominantly focus on depression, anxiety, and stress, while subjective well-being is less represented. For example, Hamza et al. (2021) reported a more significant increase in university students' negative affect among students without preexisting mental health problems. Also, Wang et al. (2020) point to the need to increase positive affect and regulate negative affect during the pandemic among college and university students. Although the number of studies relating various individual characteristics with academic functioning and students' well-being in present circumstances is increasing due to relatively recent pandemic incidence, there are still many research questions that can be posed to better understand the underlying mechanisms of students' subjective well-being during the pandemic. Hence, this study has attempted to provide additional insight into university students' subjective well-being concerning their online studying experience and personality.

### Subjective Well-Being, Academic Adjustment and Personality

Within the context of the pandemic, children and young people are often mentioned as severely affected age groups in terms of mental health. Furthermore, the student population already undergoes many changes related to new life experiences, such as adjustment to academic life, identity exploration, and new friendships or relationships (Batra et al., 2021). Hence, this already challenging period of life has become even more challenging by downsizing or even "putting on hold" some of their essential activities primarily related to social interactions and changing their educational experiences. These additional challenges can be reflected in various aspects of college and university students' emotional and personal life and mental health (Aristovnik et al., 2020; Živčić-Bećirević et al., 2021), and recent studies also recognize the importance of exploring their well-being (Van de Velde et al., 2021).

The construct of well-being is usually conceptualized through objective or subjective indicators. This study focused on the latter perspective since it aimed to contribute to a better understanding of certain psychological aspects of university students' mental health during the pandemic. Objective indicators of well-being often include conditions such as physical health, longevity, comfort, material welfare, and educational/career success (Diener, 2009; Schueller & Seligman, 2010), while studies exploring subjective well-being generally include various indicators referring to the individual's cognitive and emotional evaluation of their own life (Baños et al., 2019; Diener et al., 2003). The cognitive dimension includes the judgment of (dis)satisfaction with life domains or life in general, reflecting the level of congruence between what one aspires to and one's actual circumstances. On the other hand, the affective dimension usually comprises two affective processes; i.e., positive and negative affect. Diener et al. (2003) point out that the studies indicate a certain level of independence between these

dimensions of subjective well-being and should be assessed separately, rather than using a single aspect of well-being or ill-being. Aside from previously mentioned studies exploring university students' well-being during the pandemic, it is important to emphasize that subjective well-being significantly contributes to the positive development and adaptation of children and youth in general (Park, 2004), as well as to their mental and physical health (Steinmayr et al., 2019). This becomes even more prominent when facing various adversities, with the current pandemic being one. For example, Schwartz et al. (2021) point to the potential mental health crisis related to the pandemic, while current studies generally indicate the adverse effects of the pandemic on well-being and emphasize the importance of protective factors (Mead et al., 2021).

Subjective well-being can be affected by various individual characteristics, including personality traits, whereby extraversion, neuroticism, and conscientiousness seem to be the most relevant across different personality measures (Anglim et al., 2020). These associations could be based on the fact that emotions are an inherent part of the personality, whereby extraversion is often linked to positive affect and neuroticism to negative affect. In addition, agreeableness and conscientiousness are also moderately correlated with subjective well-being (Joshani, 2017; Lucas, 2018; Lucas & Diener, 2015). Although these associations are extensively discussed in the literature, Lucas (2018) points out that no particular model provides a clear understanding of the effects of personality on subjective well-being. Within the context of the pandemic, it should be noted that personality traits are associated with mental health, and they can strengthen or diminish coping with various adversities and stressors. Rettew et al. (2021) point out that the pandemic could be a specific stressor and that associations of personality and adjustment could depart from the usual findings.

Although with somewhat weaker contribution than personality traits, life circumstances can also affect subjective well-being, including circumstances related to academic experiences and adjustment (Fakunmoju et al., 2016). This becomes even more relevant from the perspective of studying during the pandemic when educational experiences digress from the usual (and expected) ones and pose a risk factor for students' well-being and mental health (Sun et al., 2020). Recent studies also report that university students' online learning difficulties are associated with their self-regulation, personality, and academic procrastination (Bao, 2020; Hong et al., 2021). In addition, the shift to online education can increase students' workload (Al-Kumaim et al., 2021; Aristovnik et al., 2020; Armstrong-Mensah et al., 2020), students are mostly studying alone, deprived of the usual study networks (Elmer et al., 2020), and facing various challenges in the online learning environment (Barrot et al., 2021; Singh & Quraishi, 2021). Furthermore, the lack of social interactions, which are an inherent part of the educational process as we know it, increases the risk of maladjustment and learning difficulties. As studies mentioned above indicate, many issues exist regarding the adjustment to the sudden transition to online studying. Moreover, there is also a possibility of a prolonged duration of this uncommon situation due to the uncertainty regarding the pandemic's ending. However, self-regulation difficulties in the online environment were already observed before this environment became the main form of the educational process. Pedrotti and Nistor (2019) concluded that, although a higher level of self-regulation should be expected in higher education, when it comes to self-regulation in the online learning environment, university students demonstrate very limited and surprisingly poor use of self-regulation strategies. Their study explored the online learning environment as one of the course-delivery options. However, the difficulties mentioned above could be a problem for a much higher proportion of students within the current pandemic context.

## Present Study

Recent studies indicate various concerns regarding university students' academic functioning and well-being related to the pandemic's challenging times, suggesting the need for further studies that could contribute to a better understanding of students' subjective well-being during these difficult times and consequently serve as a basis for interventions aimed at helping students to cope with academic demands. Sun et al. (2020) suggested that future studies should also include students' perception of how much the pandemic has negatively influenced their lives. Hence, this study aimed to explore the relative contribution of university students' adjustment to online studying, perceived level of life disruption caused by the pandemic, and personality in predicting their subjective well-being. It is hypothesized that functioning in the online learning environment and the perceived life disruption predict subjective well-being. More specifically, adjustment to online studying and the quality of online education are both expected to be positive predictors of life satisfaction and positive affects. In contrast, learning and self-regulation difficulties and the perceived level of life disruption caused by the pandemic are expected to predict the aforementioned criteria negatively. The reversed direction of prediction is expected for the negative affect as a criterion variable. Since previous studies indicate that personality is a robust antecedent of subjective well-being, the predictive

value of the predictors mentioned above in explaining subjective well-being was also examined when combined with personality traits. According to previous studies, a significant contribution of extraversion, neuroticism, and conscientiousness in explaining the variance of subjective well-being measures is hypothesized, assuming that students who have higher ratings of extraversion and conscientiousness and lower ratings of neuroticism will express higher life satisfaction and experience more positive and less negative affect. Previous findings are less consistent concerning specific associations of agreeableness and openness with subjective well-being than for previously mentioned traits (Lachmann et al., 2018), in spite of the indicators that – although somewhat weaker – the predictive role of agreeableness and openness in explaining the subjective well-being's variance could be expected.

## Methods

### Participants and Procedure

Participants in the study consisted of 505 university students (59.2% undergraduates and 40.8% graduates) from different Croatian faculties, 417 of whom were female (82.6%). The average age of participants was 21.86 ( $SD = 1.931$ ; min = 18, max = 36). Data were collected via the online questionnaire in March 2021, and the study complied with the prescribed ethical standards. Participants were recruited by the snowball sampling method, and participation in the study was voluntary and anonymous. Previous to questionnaire administration, participants were acquainted with the aim of the study. If they consented to participate, they continued by clicking on the link to the questionnaire (with the possibility of opting out at any point).

### Measures

General information collected by the questionnaire included students' age, gender, faculty, and study level.

Life satisfaction was examined by the Satisfaction with Life Scale (SWLS, Diener et al., 1985), including five items referring to judgments of one's own life satisfaction (e.g., In most ways, my life is close to my ideal). Participants gave their ratings on a scale from 1 (strongly disagree) to 7 (strongly agree). The total score on the scale is calculated as a sum of all items, and scale reliability expressed as a Cronbach's alpha coefficient was .86.

Positive and negative affect was assessed by the Negative and Positive Affect Scale (NAPAS, Mroczek & Kolarz, 2016), with six items for each subscale. Participants responded to how much they experienced different affective states during the past month (e.g., During the past 30 days, how much of the time did you feel hopeless/satisfied/...). The responses were given on a rating scale from 1 (not at all) to 5 (all the time). The total score on each scale is expressed as an average of associated items. Cronbach's alpha was .88 for the positive effect and .87 for the negative effect, respectively.

The Big Five Inventory (John et al., 2008) was used to assess extraversion, agreeableness, conscientiousness, openness to experience, and neuroticism (e.g., I see myself as someone who worries a lot). Participants rated 44 items on a five-degree agreement scale, and the scores on subscales are calculated as an average of related items. Cronbach's alpha coefficients for subscales ranged from .69 to .83 (Table 1).

Students' perception of the level of life disruption caused by the pandemic is expressed as an average of responses to five items related to several life domains such as family relationships, friendships, free time, and health (e.g., To what extent did the changes caused by the pandemic disrupt the quality of your family relationships). The rating scale was from 1 (not at all disrupted) to 5 (severely disrupted), and Cronbach's alpha for this composite measure was .73.

Overall adjustment to the online learning environment was measured by one item from 1 (very poor) to 5 (excellent), and students also rated the overall quality of the online education in comparison to the onsite education of their faculty on a scale from 1 (substantially worse) to 5 (substantially better).

Learning and self-regulation difficulties during online studying were assessed by five items (e.g., I have difficulties compelling myself to do my learning assignments in an online environment) on a rating scale from 1 (completely disagree) to 5 (completely agree). Since this measure was constructed for the purposes of this study, the internal validity and the postulated one-factor structure were tested by the first-order CFA, with a cut-off criterion of .50. All factor loadings were above this value (ranged from .76 through .87), and Cronbach's alpha coefficient for this scale was .87.

Statistical analyses included descriptive indicators, correlation coefficients, and hierarchical regression analyses, and SPSS 25 (an IBM software) was used to perform analyses.

Table 1. Means, Standard Deviations, and Scale Reliabilities for the Examined Variables

Variable	<i>M</i>	<i>SD</i>	$\alpha$
Adjustment to online studying (one item)	3.70	1.03	n/a
Learning and self-regulation difficulties in an online learning environment	3.40	1.05	.87
Perceived quality of the online education (one item)	2.06	0.79	n/a
Perceived level of life disruption caused by the pandemic	2.45	0.82	.73
<i>Personality</i>			
Extraversion	3.40	0.71	.82
Agreeableness	3.66	0.54	.69
Conscientiousness	3.50	0.65	.82
Openness	3.52	0.64	.81
Neuroticism	2.69	0.77	.83
<i>Subjective well-being</i>			
Life satisfaction	23.71	6.38	.86
Positive Affect	3.45	0.65	.88
Negative Affect	2.36	0.78	.87

## Results

The Inspection of average values (Table 1) revealed that students are relatively adjusted to online studying and experience a moderate level of related learning and self-regulation difficulties. Also, students perceive that the quality of online education at their faculties stands remarkably lower than the quality of the onsite education, as suggested by previous findings obtained on college students (Means et al., 2020), while the level of perceived life disruption caused by the pandemic is relatively low. Furthermore, students' ratings of all personality traits apart from neuroticism are somewhat shifted towards higher values. Finally, results concerning subjective well-being indicators reveal that students' average life satisfaction falls into the category that Diener et al. (1985) labeled as "slightly satisfied". This is in line with results reported in some previous studies, including college and university students (e.g., Cabras & Mondo, 2018; Pavot & Diener, 1993), and in line with findings indicating higher life satisfaction in young adulthood compared to adolescents, but lower compared to older adults (Abdullahi et al., 2019; Morganti et al., 1988; Siedlecki et al., 2014). Students also reported that they had experienced more positive and less negative affect lately.

Correlations between examined variables are displayed in Table 2. In addition, correlations between subjective well-being measures and participants' gender and age were also calculated since some studies indicated age and gender-related differences regarding the measures of subjective well-being (e.g., Abdullahi et al., 2019; Cabras & Mondo, 2018; Jacobsen et al., 2014). However, as they were not significant (possibly due to a relatively homogenous sample), they were not included as covariates in further analyses.

Table 3 shows the three hierarchical regression analyses that were calculated in order to explore the relative contributions of the examined predictors of student's subjective well-being, each for one criterion variable. Prior analyses indicated no multicollinearity bias since all tolerance values were above .05 or higher. In the first step, adjustment to the online learning environment, related learning and self-regulation difficulties, quality of online education, and perceived level of life disruption caused by the pandemic were entered. In the second step, personality traits were added.

Results of the regression analyses generally indicated that certain aspects of functioning in an online academic environment are predictive of students' subjective well-being and that the perceived level of life disruption caused by the pandemic was predictive in both steps of the analyses. More specifically, in the first step of the analyses, students' life satisfaction and positive affect were positively predicted by their adjustment to online studying ( $\beta = .18$  for both criteria). In contrast, the perceived level of life disruption caused by the pandemic was a negative predictor of life satisfaction ( $\beta = -.22$ ) and positive affect ( $\beta = -.37$ ). Effect sizes (displayed in Table 3) for aforementioned predictors ranged from small ( $f^2 = .02$ ) to around medium ( $f^2 = .12$ ). Positive predictors of negative

**Table 2.** Correlations Among Examined Variables (Including Correlations Between Gender, Age, and Subjective Well-Being Measures)

	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Adjustment to online studying	-.58**	.45**	-.38**	.06	.07	.30**	.02	-.11*	.24**	.23**	-.22**
2. Learning and self-regulation difficulties		-.55**	.48**	.03	-.05	-.24**	.01	.10*	-.18**	-.15**	.28**
3. Perceived quality of the online education			-.25**	-.10*	.01	.06	.01	.06	.16**	.05	-.05
4. Perceived level of life disruption caused by the pandemic				.05	-.14**	-.17**	-.06	.26**	-.27**	-.38**	.49**
5. Extraversion					.04	.30**	.31**	-.41**	.33**	.39**	-.30**
6. Agreeableness						.24**	.20**	-.36**	.21**	.26**	-.17**
7. Conscientiousness							.19**	-.32**	.37**	.30**	-.33**
8. Openness								-.11*	.16**	.10*	-.01
9. Neuroticism									-.38**	-.59**	.63**
10. Life satisfaction										.51**	-.44**
11. Positive affect											-.65**
12. Negative affect											
Gender									.08	.01	.06
Age									.08	.05	-.08

Note. \*\* $p < .01$ ; \*  $p < .05$ .

effect were learning and self-regulation difficulties ( $\beta = .11$ ;  $f^2 = .01$ ), perceived quality of the online education ( $\beta = .16$ ;  $f^2 = .02$ ), and perceived level of life disruption caused by the pandemic ( $\beta = .45$ ;  $f^2 = .19$ ).

Regarding the second step of the analyses, personality traits significantly increased the proportion of explained variance for all indicators of subjective well-being (in total, 29% for the life satisfaction, 45.1% for the positive affect, and 54.1% for the negative affect), whereby the introduction of personality traits partially diminished the effects of the predictors from the first step of the analyses. In both steps of the analyses, predictors explained the highest proportion of the negative affect's variance. All personality traits were significant predictors of negative affect, whereby extraversion ( $\beta = -.08$ ) and conscientiousness ( $\beta = -.11$ ) were negative predictors of negative affect (but with negligible effect sizes of  $f^2 = .01$ ). Agreeableness ( $\beta = .07$ ) and openness ( $\beta = .10$ ) were positive predictors of negative affect with minor effect sizes ( $f^2 = .01$ ), while neuroticism ( $\beta = .50$ ) had a medium effect size in explaining the variance of negative affect ( $f^2 = .20$ ). Further, extraversion was a positive predictor of both life satisfaction ( $\beta = .19$ ;  $f^2 = .023$ ) and positive affect ( $\beta = .21$ ;  $f^2 = .03$ ), and neuroticism was a negative predictor of both criteria ( $\beta = -.19$ ;  $f^2 = .02$  for life satisfaction and  $\beta = -.40$ ;  $f^2 = .12$  for positive affect). In addition, conscientiousness was a positive predictor of life satisfaction ( $\beta = .21$ ;  $f^2 = .03$ ).

## Discussion

Obtained results generally revealed that explored aspects of adjustment to online studying and perceived level of life disruption caused by the pandemic partially predict students' subjective well-being during the faculties' lockdown. Some of these predictive effects still persist after introducing personality traits that are previously known as very robust predictors of subjective well-being (e.g., Diener et al., 2003; Lucas, 2018). Concerning adjustment to the online learning environment, better-adjusted students experience more positive effects and are more satisfied with their lives. Also, students who experience more learning and self-regulation difficulties during online studying are likely to experience more negative and less positive affect. Difficulties regarding online learning during the pandemic were previously reported among university students (Amir et al., 2020; Armstrong-Mensah et al., 2020), implying a decreased effectiveness of online learning due to self-regulation difficulties (Bao, 2020; Hong et al., 2021) and the lack of the usual peer-to-peer motivation in an online environment which could be a potential stressor for students (Chaturvedi et al., 2021; Živčić-Bećirević et al., 2021).

**Table 3.** Results of Hierarchical Regression Analyses, with Adjustment to Online Studying, Related Learning and Self-Regulation Difficulties, Perceived Level of Life Disruption Caused by the Pandemic, and Personality Traits as Predictors, and Indicators of Subjective Well-Being as Criterion Variables (Life satisfaction, Positive affect, Negative affect)

Predictors	Life satisfaction			Positive affect			Negative affect		
	$\beta$	$t$	$f^2$	$\beta$	$t$	$f^2$	$\beta$	$t$	$f^2$
Adjustment to online studying	.18	3.41**	.02	.18	3.49**	.02	-.07	-1.50	
Learning and self-regulation difficulties	.07	1.09		-.09	-1.57		.11	2.10*	.01
Perceived quality of online education	.05	1.03		-.07	-1.45		.16	3.42**	.02
Perceived level of life disruption caused by the pandemic	-.22	-4.51***	.04	-.37	-7.96***	.12	.45	10.30***	.19
	$R^2 = .100$ $F = 13.80***$			$R^2 = .163$ $F = 24.12***$			$R^2 = .264$ $F = 44.44***$		
<i>Second step</i>									
Adjustment to online studying	.08	1.67		.11	2.36*	.01	-.01	0.10	
Learning and self-regulation difficulties	.09	1.56		-.10	-1.98*	.01	.09	2.04*	.01
Perceived quality of online education	.15	3.13**	.01	.04	0.92		.05	1.29	
Perceived level of life disruption caused by the pandemic	-.14	-3.05**	.01	-.24	-6.13***	.01	.33	9.00***	.08
Extraversion	.19	4.09***	.02	.21	5.23***	.03	-.08	-2.04*	.01
Agreeableness	.06	1.43		.07	1.96		.07	2.02*	.01
Conscientiousness	.21	4.69***	.03	.06	0.16		-.11	-3.13**	.01
Openness	.02	0.35		-.06	-0.12		.10	3.01**	.01
Neuroticism	-.19	-3.97***	.02	-.40	-9.71***	.12	.50	13.19***	.20
	$R^2 = .290$ $F = 22.20***$ ( $\Delta R^2 = .189***$ )			$R^2 = .451$ $F = 44.68***$ ( $\Delta R^2 = .288***$ )			$R^2 = .541$ $F = 64.05***$ ( $\Delta R^2 = .276***$ )		

Note. \*\*\* =  $p < .001$ ; \*\* =  $p < .01$ ; \* =  $p < .05$ ; effect sizes (Cohen's  $f^2$ ) are displayed for significant predictors only.

Results obtained in this study indicate that difficulties in learning and self-regulation are related to the affective dimensions of subjective well-being. At the same time, they were not predictive of the cognitive dimension; i.e., life satisfaction. However, life satisfaction was predicted by the perceived quality of online education, implying that teachers' adjustment to the online environment may also be among the factors contributing to students' subjective well-being, as observed in the literature. Namely, college and university students' satisfaction with the online learning environment is higher among students who perceive that their teachers are more enthusiastic and skillful in presenting materials as well as interacting with students (Fatani, 2020; Means et al., 2020). Since studying experiences certainly are a salient part of students' lives, the predictive value of certain academic-related factors, apart from the effects of personality, could be expected. On the other hand, concerning the lack of some predictive effects of these variables on each indicator of subjective well-being, and very small effect sizes, it is possible that the stress level induced by the pandemic somewhat decreased; i.e., that the students partially adjusted to these circumstances that have already lasted a year, as suggested by Rettew et al. (2021).

The perceived level of life disruption caused by the pandemic predicted both cognitive and affective dimensions of students' subjective well-being. Students who perceive a higher level of disruption caused by the pandemic reported more negative and less positive affect and lower life satisfaction, implying specific difficulties in adapting to negative life events and adversities, including pandemic-related changes. The effect of perceived level of life disruption is particularly strong concerning the affective dimension of students' subjective well-being. According to the literature, it is hypothesized that the affective dimension of well-being could be more under the influence of short-term changes in life circumstances than the cognitive dimension, since the cognitive appraisal is less reactive than the emotional regulation system (Luhmann et al., 2012). From this perspective, the effects of the pandemic on students' life satisfaction could occur later in life, especially if cumulated onto other adverse events, which should be explored in subsequent studies within a temporal distance from this specific situation. Namely, longitudinal studies supported the assumption regarding the importance of situational factors, implying that their role, although not as pronounced as the role of personality, should be recognized and acknowledged (Lucas, 2018).

Personality, as expected, served as a predictor of students' subjective well-being, particularly neuroticism, while the effects of extraversion and conscientiousness were much smaller. Obtained results indicate that students with a higher level of extraversion are somewhat more satisfied with life and prone to positive affect, whereas students with a higher level of neuroticism express a lower level of subjective well-being. Previous studies demonstrated the association between extraversion and subjective well-being, indicating that individuals who are more sociable, active, and characterized by positive emotionality are more satisfied with life and prone to positive affect (Lucas, 2018). However, in this study, the effects of extraversion are rather small, which could relate to the assumption by Rettew et al. (2021), implying that the pandemic situation could be a specific situation in which associations of personality and adjustment could differ from other situations. On the other hand, students who registered higher on neuroticism; i.e., who are more anxious and more vulnerable to stress, express a lower level of subjective well-being, confirming the expected predictive effects of neuroticism on students' well-being. Further, results also revealed that students with a higher level of conscientiousness; i.e., those who tend to be organized, self-controlled, disciplined, and hard-working are, to a certain extent, more satisfied with life and less prone to negative affect. These characteristics have previously been demonstrated as predictive of good academic performance, self-regulation, and persistence when facing challenging situations and adversities (Oshio et al., 2018; Richardson et al., 2012). Hence, conscientiousness can contribute to a better adjustment and more success in fulfilling various academic demands in challenging circumstances (such as the pandemic) and consequently reflect on subjective well-being.

Results regarding other personality traits are partially in accordance with certain findings from the literature and indicate that these traits should also be considered, as also observed by some other authors (Joshani, 2017; Lucas & Diener, 2015; Steel et al., 2008). In this study, all personality traits were, to a certain extent, predictive of students' negative affect, whereby openness and agreeableness were, interestingly, positive predictors of negative affect. Although previous findings are not consistent (Lachmann et al., 2018), partly similar associations were reported in the literature. González Gutiérrez et al. (2005) obtained that openness was a positive predictor of both positive and negative affect, while agreeableness was not a significant predictor for either of these indicators. On the other hand, agreeableness was a positive predictor of anxiety, depression, and stress in a recent study on emotional distress during the pandemic (Margetić et al., 2021), which implies the need for a more detailed insight into these associations. McCrae and Costa (1991) discussed the complexity of openness and affect and proposed that individuals characterized by imagination and sensitivity could generally experience all types of emotions more intensely. During the pandemic, these students might express a greater sensitivity to negative emotions due to the general lack of the usual in-person interaction as one of the mechanisms relevant for maintaining quality relationships. Fakunmoju et al. (2016) indicated that peer support contributes to the perceived meaningfulness of graduate students' learning experiences. Also, according to meta-analyses conducted by Richardson et al. (2012), university students who register high in openness and agreeableness could be more inclined to regular class attendance. Keeping in mind that these findings refer to the usual (onsite) studying, obtained positive associations between these two traits and the negative affect in this study could imply that students with higher agreeableness and openness might experience more emotional stress related to the shift to online studying. Also, since positive affect is often discussed within the context of relationships with others, it is possible that more agreeable students, due to pandemic-related social distancing measures, express a greater sensitivity to negative emotions due to the lack of the usual in-person interaction as one of the mechanisms relevant for maintaining quality relationships. Finally, since openness was a somewhat stronger predictor of negative affect than agreeableness, it is possible that students who are characterized by intellectual curiosity, imaginativeness, and reconsidering new ideas and experiences, are more affected by the lack of usual onsite interactions with teachers and colleagues and by the lack of group discussions whose dynamic is changed in an online environment in terms of creative thinking stimulation. Since, according to Fakunmoju et al. (2016), peer support contributes to the perceived meaningfulness of learning experiences within higher education, the lack of usual peer support in social interaction with colleagues at the faculty could diminish students' well-being. Živčić-Bećirević et al. (2021) also point to the importance of social interactions for university students' mental health since, in their study, university students indicated social isolation as a main source of stress during the pandemic.

However, all of the assumptions above need additional verification in future studies related to specific effects of pandemic-related changes in students' academic functioning, especially keeping in mind the already mentioned observation by Rettew et al. (2021), who indicated that the pandemic might be a specific situation in which certain associations could digress more from the usual ones. It seems that this particularly

refers to the role of agreeableness and openness in negative affect. In addition, the effects of certain factors could differ depending on whether they were explored right upon the lockdown or after an extended period of the pandemic.

## Strengths and Limitations

Since studies on various effects of the COVID-19 pandemic are, in the literature, still relatively new, this study could generally contribute to the recent literature that points to the importance of adjustment to changed life circumstances among students. Furthermore, raising awareness regarding the potential difficulties that young people might encounter due to social isolation and unexpected studying conditions, and reconsidering various factors that contribute to their well-being, might be helpful in planning interventions aimed at strengthening their mental health and avoiding the long-term effects of this protracted crisis.

The limitations of this study should also be considered. This study does not provide the information on students' subjective well-being before the pandemic that would allow exploring potential longitudinal changes in observed associations, and the methodological nature of this study does not allow for causal inference. Further, since the questionnaire was administered online and participation was voluntary, the sample was not random. The generalizability of these findings should also be taken with caution in terms of possible differences among various faculties/universities and among countries regarding the quality of the transition to the online learning environment during the pandemic.

## Conclusion, Implications and Future Directions

Obtained results indicate that aside from personality, some aspects of academic functioning upon the transition to online studying could contribute to students' subjective well-being during the pandemic. However, these findings should be additionally explored in further studies, considering that the pandemic is still a relatively new situation with potential long-term effects on mental health and subjective well-being. Furthermore, obtained results suggest the need for a more detailed insight into the association of openness and agreeableness with students' subjective well-being in these unusual circumstances. In addition, these variables should also be explored along with a more comprehensive examination of the online learning environment's quality (including teachers' adjustment). Also, it would be helpful to additionally explore these findings from the perspective of Self-Determination (Ryan & Deci, 2000). Namely, it is possible that students' sense of basic psychological needs fulfillment may decrease due to the pandemic; i.e., within the context of higher education, students' sense of competence could be decreased in an online learning environment, as well as their relatedness with colleagues, while the pandemic can reduce their sense of autonomy in general.

Although this study has previously mentioned limitations, the obtained results provide an additional insight into students' subjective well-being during these challenging and uncertain pandemic times, which considerably changed their studying experiences. It is plausible that students' responses to online studying during the pandemic can vary concerning their individual differences in adjustment, personality, and perception of how much the pandemic disrupted their lives. These factors should be considered and included in planning interventions to increase both the quality of the online learning environment and students' well-being during and after the pandemic. In this manner, faculties could invest further efforts into additionally educating teaching staff on using various tools for more interactive and engaging online education. Namely, significant difficulties regarding technological literacy are not expected among new generations of students (Barrot et al., 2021); however, these difficulties could be more present among faculty staff, especially regarding the use of various online educational platforms and distance learning tools. Furthermore, additional support could be directed towards identifying students who experience difficulties in an online learning environment; i.e., those experiencing difficulties in meeting academic demands and at potential risk of developing mental health problems. Courses or workshops on developing self-regulation strategies could help students manage their time and learning process. In addition, counseling students on effective strategies for coping with adversities and building their resilience could also be helpful. These challenges are also related to the readiness and the capacities of different higher education institutions to raise and maintain the quality of the educational process in the online learning environment and reduce potential academic-related risk factors that could influence students' well-being and mental health.

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### Author contributions

Tea PAVIN IVANEC: conceptualization, design, methodology, data management, formal analysis, interpretation, writing original draft, writing review and editing.

Iva FABIJANIĆ: conceptualization, design, methodology, investigation, data management, interpretation, writing original draft, writing review and editing.

All authors gave their final approval of the version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

### Declaration of interest statement

The authors have no conflicts of interest to disclose.

### Ethical statement

This manuscript is the authors' original work.

The study was reviewed and approved according to the guidelines and rules of conduct issued by The Ethics Review Committee of the Faculty of Teacher Education University of Zagreb (No. 602-04/15-01/223, 251-378-04/15/1).

All students participated in the research voluntarily and anonymously, and provided their written informed consent to participate in this study.

Data are stored in coded materials and databases without personal data, and the authors have policies in place to manage and keep data secure.

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