

## RESEARCH ARTICLE

# Incidence and occurrence of academic burnout: The impact of personality, self-efficacy and self-esteem and post-pandemic effects

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## ABSTRACT

Academic burnout is a health issues that largely interests the global community and troubles students at all academic levels. Despite the significant effects on students' quality of life, well-being, and academic performance, yet, it has not been adequately examined. Therefore, this study is aimed at exploring the levels of academic burnout, the personality's role as predictor (through Big Five Factors) and the effect of protective factor like self-efficacy and self-esteem. Moreover, in an innovative way, a multi-group analysis will be proposed to verify differences between the variables observed in the COVID-19 and post-COVID-19 period. Through a total sample of 609 students, it proposed a multiple-mediation model with a comparison between two phases: pandemic and post-pandemic. Results suggest that among the Big Five Factors, there are strong predictors of the effects of burnout, and specifically that conscientiousness and self-efficacy are important in the management of the academic burnout and that self-esteem could support students and mitigate feelings of inadequacy in different academic challenges. Moreover, the pandemic seems to have worsened emotional instability and negative effect on university stress. Studies such as this provide valuable information for educators and all stakeholders who want to contribute to the education and training for students' life and educational journey in a way that is certainly more holistic, equitable and accessible to all.

**Keywords:** academic burnout; mediation model; personality traits; self-efficacy; self-esteem

## 1. Introduction

Among the health issues that most affected the global community were the levels of anxiety and stress that COVID-19 pandemic and post-pandemic caused. Also university students have been affected, increasing the levels of uncertainty and worry that often characterise their academic careers. University and college experience indeed entails discomfort for some students, because they are involved in structured coercive activities, stressful goals that cause them high levels of anxiety and depression<sup>[1,2]</sup>. The restrictions introduced due to the COVID-19 pandemic directly caused several changes in the academic and social experience of the university. Self-isolation and online teaching have amplified students' mental health vulnerability and exacerbated pre-existing difficulties.

The situation that followed COVID-19 challenged university students with a new condition: isolation, new ways of relating (with peers and lecturers) and new and different tools that stimulate new learning styles. Even the post-pandemic recovery, considering the long period of restriction experienced, did not produce a

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simple return to the previous status quo, but a new challenge with pressing and specific demands on students' adaptability<sup>[3]</sup>.

Several studies were carried out<sup>[4-11]</sup> to investigate the relationship between the levels of stress and anxiety in university students during COVID-19. The university students participating in the different studies in an international perspective, reported in general a negative influence on individuals' happiness and sense of well-being, as well as an increased frequency of anxiety, stress, depression and lower performance<sup>[12-14]</sup>. Similar results are reported from cross-sectional and longitudinal studies. For example, the cross-sectional study carried out by Li and colleagues<sup>[14]</sup> with students of Wuhan suggested the severity of the psychological impact of COVID-19, emphasising a higher prevalence of typical post-traumatic stress syndrome (PTSD) symptoms such as intrusion, avoidance and hyperarousal in infected students than in uninfected students. Similarly, another cross-sectional study by Jiang<sup>[13]</sup> suggested that anxiety levels were significantly higher among university students who perceived their academic performance to be affected by the COVID-19 pandemic. Furthermore, the same study reported that high academic burnout is often associated with excessive and problematic use of social media, which increases the risk of Internet addiction and higher levels of anxiety. Another cross-sectional study by Andrade and colleagues<sup>[15]</sup> analysed predictive factors outside academia that significantly impacted the development of academic burnout during the COVID-19 pandemic. The authors found a negative effect of family functioning, perceived social support and coping on academic burnout, exacerbating the negative effects of anxiety and depression. A longitudinal study by Yaghi<sup>[16]</sup> examined the impact on mental health (anxiety and depression) caused by the changes in academic teaching due to the pandemic. Results indicated that anxiety and stress remained elevated for all three measurements, increasing their trend, hypothesising that an increased awareness of the severity of the situation was followed by low levels of optimism and an overall worsening of mental health. Furthermore, it is reported that the pandemic had a powerful long-term effect on several aspects of students' lives, including school performance, social relationships and future employability. Similar results were also observed for the period following the lockdown. Haucke et al.<sup>[17]</sup>, indeed, reported a deterioration in students' general mental health, increased concern about being infected with the virus, and uncertainty about re-establishing social interactions after isolation. Other post-pandemic studies equally supported a significant increase in fear, anxiety and stress related to their return to university environments<sup>[18-20]</sup>.

Burnout has a long tradition in workplace studies and is usually examined among employees, but recently, research on students is starting to focus on these forms of well-being as well. Like employees, students are at risk of burnout since the activities performed by them are similar to work activities<sup>[2,21,22]</sup>.

According to Maslach et al.<sup>[23]</sup>, burnout can be defined as a prolonged and chronic stress-related syndrome in the work environment. Burnout was then classified into three specific dimensions: (1) emotional exhaustion, a situation in which the emotionally exhausted individual, with no strength left to start again, feels that he or she can no longer give something to others and therefore withdraws from emotional involvement; (2) depersonalisation, understood as mental distance from one's work, with the tendency to perform tasks in a mechanical manner, with standardised, stereotyped and bureaucratic procedures; finally, (3) reduced personal fulfilment, i.e., a situation in which the individual feels a strong sense of inadequacy in relation to work, also involving family life.

The same definition could be applied in the academic sphere, where the activities carried out by university students can be associated with those in the work context: dealing with a series of stressful events such as taking examinations and preparing assignments during the study period and coping with changing situations that require different adaptation and coping strategies, are actually some of the activities that can generate academic burnout<sup>[24]</sup>. Academic burnout is classified into three dimensions: the feeling of exhaustion resulting

from being obliged to study (exhaustion), the pessimism towards tasks (cynicism) and the feeling of incompetence as a student (ineffectiveness)<sup>[25]</sup>.

Given that, the present study aims to provide insight into personality traits and others factors (self-esteem and self-efficacy) that may foster or thwart the experience of academic burnout.

### **1.1. The relationship between academic burnout and personality factors**

In the investigation and study of the academic burnout construct, it is crucial to include an in-depth examination of the role played by personal factors and personality. Freudenberger<sup>[26]</sup>, who first introduced the burnout concept, recognised the importance of personality, but also Maslach and Jackson<sup>[27]</sup> emphasised that interpersonal traits, such as intrinsic characteristics and social supports, are more fundamental than physical and environmental factors in explaining and analysing the burnout construct.

Actually, the influence of personality traits on academic burnout may be explained within the framework of the cognitive-affective personality system<sup>[28]</sup> according to which information from the environment is directly filtered and influenced by the individual's personality.

Applying this to the university context and based on the student's personal structure, this means that the student perceives signals from the academic environment and reacts to it according to the assessment it does based on its personality characteristics<sup>[29]</sup>. For example, a person with high levels of neuroticism would react negatively and unstable to a number of assignments or exams, as they would interpret them as particularly threatening and overly challenging. In contrast, a person with a low degree of neuroticism would be able to handle this situation, making the best use of his coping and adaptation strategies and establishing a solid plan of action.

In this panorama, the five-factor model is considered a framework that provides descriptive information on various traits (extroversion, agreeableness, conscientiousness, neuroticism and openness) and presents sufficient empirical evidence in various fields of application in psychology, including its association with variables relating to the academic behaviour of university students<sup>[30,31]</sup>.

Among the results, it was possible to identify that neuroticism, negative temperament and anxiety are predictors of academic burnout, although conscientiousness and openness are also likely to negatively predict it due to the direct relationship of these traits with certain beliefs about a student's academic behaviour, such as academic self-efficacy<sup>[32,33]</sup>. High levels of neuroticism are also reported in different studies as being associated with negative emotions and burnout, as they reflect a high stress sensitivity of the individual<sup>[34,35]</sup>. Conversely, extroversion, characterised mainly by activity, energy and positive emotions, is negatively correlated with states of deactivation and disappointment, such as burnout and boredom<sup>[36]</sup>.

Similarly, high levels of conscientiousness reflect positive characteristics of individuals, who feel more prepared to cope with demands and are less vulnerable to boredom and burnout<sup>[34]</sup>. Agreeableness similarly promotes well-being through the development of interpersonal resources and is negatively associated with burnout<sup>[34]</sup>.

Finally, openness to experience reflects the extent to which students engage in active coping with the challenges and demands of their "work environment". This factor appears to correlate negatively with depersonalisation<sup>[36]</sup> and positively with personal fulfilment<sup>[37]</sup>, two dimensions of burnout.

### **1.2. The multiple mediation effect of self-efficacy and self-esteem on perception of academic burnout**

Other significant variables also have a considerable impact on burnout, including academic burnout.

Indeed, self-efficacy and self-esteem can be considered important protective factors that mitigate and ameliorate the negative effects of burnout<sup>[38–43]</sup>.

General self-efficacy is defined as the ability to efficiently achieve set goals<sup>[44]</sup>. It represents broad and mostly stable general assessments of personal competence but is not an individual's ability, but rather the confidence in the ability to cope with various challenging situations.

Self-efficacy is a particularly powerful factor in terms of understanding behaviour in non-traditional experiences and is crucial in managing and coping with the complex challenges faced by university students<sup>[44]</sup>. As an example, several studies revealed that self-efficacy is negatively correlated with depression and loneliness in university students<sup>[45–48]</sup>. Furthermore, as a factor related to motivation, it is strongly related to students' persistence and academic achievement<sup>[43]</sup>, and correlates positively with adjustment<sup>[49–52]</sup>, and with university academic performance in general<sup>[45,53–56]</sup>. Self-efficacy thus emerges as a means through which students succeed in living their university life and experience better, accepting it as a challenge, an opportunity and no longer as a threat to be defended against<sup>[57]</sup>.

Concerning the mediator role, previous studies have highlighted the important protective role performed by self-efficacy. Indeed, people with a strong/positive personality usually report better self-efficacy and experience less burnout, whereas people with a weak/negative personality often have low self-efficacy, which can lead to severe burnout when facing different job challenges<sup>[58]</sup>.

Other studies<sup>[59–61]</sup> showed that individuals with high self-efficacy and extroversion scores report lower experiences of burnout, while more unstable individuals with low self-efficacy levels report more frequent and stronger experiences of burnout. Furthermore, as suggested by Ebstrup et al.<sup>[60]</sup> and Şahin and Çetin<sup>[61]</sup>, it would appear that general self-efficacy mediates the relationship between Big Five personality traits and subjects' perceived stress.

Another burnout-related variable with a protective effect is self-esteem. Current literature on the topic supports the relationship between burnout and self-esteem, showing how the latter can buffer the negative effects of a stressful demand on burnout<sup>[62]</sup>.

Self-esteem can be defined as a personal assessment that an individual makes of him or herself, of his or her sense of self-worth and of his or her importance or abilities<sup>[63]</sup>. It represents the feeling of being capable of successfully solving life's challenges. The literature suggested that lower levels of self-esteem predict more mental and physical illness, and that students with lower self-esteem specifically experienced more negative emotions and lower academic performance<sup>[64]</sup>.

More clearly, Dahlin et al.<sup>[65]</sup> in their cross-sectional study, examined the relationship between burnout and self-esteem among university students, finding that performance-based self-esteem was significantly correlated with two dimensions of burnout, exhaustion and disengagement. Therefore, low self-esteem is a crucial factor for burnout. High levels of self-esteem indeed frequently associated with an increased ability to cope with stress in demanding situations<sup>[62,66]</sup> and, specifically, with lower levels of burnout<sup>[67]</sup>. High levels of self-esteem thus result in lower perceived fatigue and greater personal and academic fulfilment<sup>[68–70]</sup>.

In terms of internal factors, personality and self-esteem are the main predictors of academic burnout. Personality has an important effect on academic burnout through low levels of conscientiousness, low extroversion, low agreeableness and high levels of neuroticism. In addition, lower self-esteem appears to be significantly correlated with higher levels of exhaustion and disengagement, which are functions of academic burnout<sup>[71]</sup>.

Although the literature on the topic lacks studies that directly examine the mediating role of self-esteem between personality factors and academic burnout, we considered it appropriate to test this effect also on the basis of the reported indications in the relationships between personality and self-esteem and between self-esteem and burnout.

Further studies suggested that self-esteem mediates the relationship between personality traits and subject well-being<sup>[72]</sup> and furthermore Kwan et al.<sup>[73]</sup> showed that self-esteem mediates the relationship between four personality traits (extraversion, neuroticism, conscientiousness and openness) and life satisfaction. More recently, Lai et al.<sup>[74]</sup> revealed that self-esteem mediates the relationship between personality and social cynicism (similar to one of the burnout factors).

Finally, in another longitudinal study considering negative outcomes, self-esteem levels seemed to mediate Big Five personality traits and subsequent depressive symptoms<sup>[75]</sup>.

### **1.3. Purpose of the study**

The literature review led us to develop a study on the incidence and occurrence of academic burnout among university students and how personal and internal factors (such as personality, self-efficacy and self-esteem) may influence it. In addition, in light of a paucity of studies and little debate on the topic, we chose to analyse an additional aspect regarding post-pandemic effects on university students and in relation to academic burnout.

For these reasons, the specific objectives of our study are:

- 1) to investigate the levels of academic burnout in university students and examine the predictive role of the five personality factors.
- 2) to test whether self-efficacy and self-esteem as protective factors are mediating between personality styles and their effects on academic burnout in university students.
- 3) to test the differences across two separate time periods (during COVID-19 and post COVID-19) for all the variables of the hypothesised model using a multi-group analysis.

Considering the literature, we stated the following hypotheses.

**Hypothesis 1:** Burnout will be positively associated with neuroticism and negatively associated with conscientiousness, agreeableness, extraversion, and openness to experience.

**Hypothesis 2:** Self-efficacy and self-esteem are protective factors against academic burnout and mediate between personality traits and their effects on academic burnout.

**Hypothesis 3:** A significant difference will emerge in the comparison of two group (during COVID-19 vs post-COVID-19), obtaining performing multi-group analyses.

## **2. Method**

### **2.1. Participants and procedure**

The study enrolled 609 students (males = 278, 45.6%; females = 331, 54.4%) studying in different degree courses (Law and Political Science = 122, 20%; Medicine and Psychology = 320, 52.5%; Engineering and Physics = 167, 27.5%) distributed across Italian universities (North = 214, 35.1%; Centre = 196, 32.2%; South = 199, 32.7%). The average age of the participants was 21.9 years ( $SD = 2.91$ ).

The study was carried out in two distinct periods: the first during the pandemic, when students attended lectures and had to complete all activities (including internships) via virtual learning ( $N = 316$ ); the second after the pandemic, when university students returned to lectures and face-to-face activities ( $N = 292$ ). The

students participating in the first study (online) and in the second (face-to-face) attended at least 83% of the lectures.

The investigation period for the first group of undergraduate students was from April 2020 to April 2021; while for the second group who attended classes in person, the investigation period was from March 2022 to January 2023. The survey is conducted on the same groups of university students who attended the courses progressively, although since no matching was done during the first survey, we consider the research design of our study to be cross-sectional.

The study was carried out in accordance with the Declaration of Helsinki and the protocol was authorised by the Internal Ethics Committee of the Department of Education Sciences (Psychology Section) of the University of Catania (Ierb-Edunict-2020/2); the relevant research procedures followed all the guidelines of the AIP (Italian Psychology Association) and its Ethics Council.

Participation was voluntary. Participants were enrolled through convenience sampling. Participants received a survey package including the questionnaire, a cover letter explaining the purpose of the study and a consent form emphasising that participation was anonymous and voluntary. By clicking on the link, participants received an information sheet and an informed consent form that, once accepted, led to the survey with instructions on how to complete it. Completing the questionnaires took about 20 min.

## **2.2. Measures**

### **2.2.1. Rosenberg Self-esteem scale (RSE)**

The RSE scale developed by Rosenberg<sup>[76]</sup> and in the Italian context by Prezza et al.<sup>[77]</sup> was used to assess the construct of self-esteem. The measure is a self-report scale, measured through 10 items on a 4-point agreement scale (from “strongly agree” to “strongly disagree”). An example item was “On the whole, I am satisfied with myself.” The scale measures the overall and personal degree of self-esteem. In the Italian version, two related factors emerged: self-derogation and self-recognition. The scores obtained could range from 0 to 30. Low levels of self-esteem are obtained for scores below the cut-off of 15. The Cronbach’s alpha for this scale in this current study was 0.79 for the second-order factor, while it was 0.76 for self-derogation and 0.82 for self-recognition.

### **2.2.2. School Burnout Inventory-University (SBI-U)**

School Burnout Inventory-University scale<sup>[78]</sup> was used to assess burnout levels among university students. The scale developed by Salmela and colleagues<sup>[79]</sup> and validated in Italy by Platania et al.<sup>[80]</sup>, is composed of 9 different items, measured on a 6-point Likert scale (from 1 = completely disagree to 6 = completely agree). Moreover, the instrument provides the measurement and identification of 3 sub-scales: Exhaustion, Cynicism and Inadequacy. Among the items used, “I feel overwhelmed by academic work” was taken as an example of an exhaustion item, “I feel a lack motivation in academic work and often think of giving up” as an example of a cynicism item, and “I often have feelings of inadequacy in my academic work” as an example of an inadequacy item. In the present study, the reliability of the three factors were Exhaustion (0.80), Cynicism (0.80) and Inadequacy (0.67), respectively.

### **2.2.3. Big Five Inventory-10 (BFI-10)**

The Big Five Inventory-10 (BFI-10) developed by Rammstedt<sup>[81]</sup> and validated in the Italian context by Guido et al.<sup>[82]</sup> was used to assess personality traits. This scale, smaller in size than the famous extended version, was developed to adequately assess the dimensions proposed by the Big Five, while maintaining acceptable reliability and validity indices.

The instrument is a self-report scale, consisting of 10 items that let individuals evaluate themselves through a 5-point Likert scale. Each dimension of the Big Five is investigated through two scale items, one of them in reverse scored mode. Example of one item was “I see myself as someone who ... in reserved.” Specifically, the factors investigated are extroversion, agreeableness, conscientiousness, emotional stability, and openness.

#### **2.2.4. General Self-efficacy scale (GSE)**

The General Self-efficacy scale, developed by Schwarzer and Jerusalem<sup>[83]</sup> is a test consisting of 10 items, each rated on a 4-point Likert scale, from “Not all true” to “Totally true”. An example of one item is “Thanks to my qualities and resources I can overcome unforeseen situations.”

The peculiarity of this scale compared to others on the topic is that it doesn't assess optimism but makes explicit reference to self-efficacy.

### **2.3. Data analysis**

Descriptive statistics, discriminant validity, reliability and correlations between variables were computed<sup>[84]</sup>. Furthermore, to complete the reliability analyses, the convergent validity was added by calculating the extracted mean variance (AVE) and construction reliability (CR). Both, the AVE must be  $>0.50$ <sup>[85]</sup> and the CR  $> 0.60$ .

Other well-known analytical methods were also used, such as correlations, which were implemented using SPSS 27.0 and AMOS 27.0.

A confirmatory factor analysis (CFA) was then used to test the fit of the measurement model. The  $\chi^2$  test examines the null hypothesis that the covariance matrix and mean vector in the population are equal to the covariance matrix and mean vector implied by the model<sup>[86]</sup>. A significant value of  $\chi^2$  results in the rejection of the null hypothesis that the model fits the population. Since the  $\chi^2$  is highly sensitive to sample size (i.e., the larger the sample size, the higher the probability of model rejection), the chi-square ( $\chi^2$ )/degrees of freedom ( $df$ ) ratio is usually analysed. Kline<sup>[87]</sup> recommends that a  $\chi^2/df$  greater than 3.0 represents inadequate fit. In accordance to Hu and Bentler<sup>[88]</sup>, a CFI more than 0.95 is an indication of a good model fit. The RMSEA is a measure of model approximation. According to Browne and Cudeck<sup>[89]</sup>, an RMSEA below the value of 0.09 is also an indicator of a reasonable error of approximation in smaller samples. Finally, the SRMR coefficient is a standardized measure for the evaluation of the model residuals, with critical values up to 0.08 considered acceptable<sup>[89]</sup>. To measure the statistical power of the sample, we performed a post-hoc calculation of statistical power using multiple regression analysis. The power of the hypothesis test is between 0 and 1; if the power is close to 1, the hypothesis test is very good<sup>[90]</sup>.

The mediation was tested by applying two regression models simultaneously, assuming that the total effect of the dependent variable on the independent variable is different from the direct effect of the variable. The indirect effect was tested using a bootstrap estimation approach on 2000 samples and a percentile method corrected for 95% bias<sup>[91]</sup>. Furthermore, for estimating the moderating effect of the two different groups, we applied invariance tests and multigroup analyses to test the difference between pandemic and recovery university life in the hypothesised model (**Figure 1**). For this purpose, we used maximum likelihood (ML) estimation methods, fit the model individually to each group to remove elements that did not contribute to the quality of adjustment, and then tested the model estimate between groups.

## **3. Results**

### **3.1. Descriptive statistic, correlation, and reliability**

**Table 1** shows the items, the total means with standard deviations, the means by gender in the two subgroups and the total means of the normative scores of the scales used in our study.

**Table 1.** Descriptive statistic total sample, sub sample and standard normative scores.

	Total our sample scores		Group 1 (N = 316)				Group 2 (N = 292)				Standard normative scores			
	M	SD	Female		Male		Female		Male		Female		Male	
			M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Exhaustion	4.97	1.25	4.58	1.55	4.68	1.42	5.26	0.81	5.38	0.84	4.36	1.75	5.22	0.96
Inadequacy	5.32	1.37	4.87	1.72	5.03	1.56	5.75	0.84	5.69	0.89	3.86	0.77	3.91	0.84
Cynicism	4.72	1.40	4.30	1.70	4.45	1.55	5.14	0.89	5.02	0.99	3.98	0.89	4.01	1.14
Self-efficacy	29.84	8.27	28.0	8.4	30.3	7.17	31.0	9.94	29.5	10.8	31.88	6.50	32.12	5.10
Self-esteem	24.55	7.15	25.1	7.4	25.1	8.2	24.2	7.1	23.5	8.5	31.14	4.55	32.53	3.92
Extraversion	3.22	0.95	3.19	1.06	3.33	0.96	3.14	0.91	3.20	0.88	3.27	0.91	3.21	0.94
Agreeableness	3.78	0.28	3.77	0.30	3.73	0.32	3.84	0.23	3.75	0.27	3.27	0.85	3.12	0.80
Conscientiousnes	2.60	1.02	2.95	1.11	2.89	1.16	2.31	0.78	2.15	0.67	4.18	0.66	4.02	0.72
Neuroticism	3.32	1.12	3.67	1.01	3.63	1.12	2.92	1.11	3.07	1.0	3.38	0.87	3.60	0.81
Openness	4.41	0.34	4.39	0.35	4.40	0.35	4.44	0.34	4.41	0.33	3.49	0.89	3.34	0.86

The results in **Table 2** show the correlations of the study variables, the descriptive statistics and the indices of reliability and validity. The results indicate a significant correlation of extroversion with exhaustion  $r = -0.10$  ( $p < 0.05$ ), with inadequacy  $r = -0.11$  ( $p < 0.001$ ), and with cynicism  $r = -0.10$  ( $p < 0.05$ ). No significant correlations were found between agreeableness and the three subscales. On the other hand, conscientiousness negatively correlates with exhaustion  $r = -0.44$  ( $p < 0.001$ ), with inadequacy  $r = -0.44$  ( $p < 0.001$ ), and with cynicism  $r = -0.42$  ( $p < 0.001$ ). Neuroticism correlates with exhaustion  $r = 0.38$  ( $p < 0.001$ ), with inadequacy  $r = 0.37$  ( $p < 0.001$ ), and with cynicism  $r = 0.36$  ( $p < 0.001$ ). Openness correlates with exhaustion  $r = -0.26$  ( $p < 0.001$ ), with inadequacy  $r = -0.23$  ( $p < 0.001$ ), and with cynicism  $r = -0.23$  ( $p < 0.001$ ). Self-efficacy correlates with exhaustion  $r = -0.23$  ( $p < 0.001$ ), with inadequacy  $r = -0.20$  ( $p < 0.001$ ), with cynicism  $r = -0.22$  ( $p < 0.001$ ), with self-esteem  $r = 0.63$  ( $p < 0.001$ ), with extraversion  $r = 0.10$  ( $p < 0.001$ ), with conscientiousness  $r = 0.10$  ( $p < 0.05$ ), and with neuroticism  $r = -0.12$  ( $p < 0.001$ ). Self-esteem correlates with exhaustion  $r = -0.15$  ( $p < 0.001$ ), with inadequacy  $r = -0.08$  ( $p < 0.05$ ), with cynicism  $r = -0.09$  ( $p < 0.05$ ), with extraversion  $r = 0.05$ , ( $p < 0.001$ ), with agreeableness  $r = -0.08$  ( $p < 0.05$ ), and with neuroticism  $r = -0.09$  ( $p < 0.05$ ).

**Table 2.** Correlation and reliability total sample (N = 606).

	$\alpha$	AVE	CR	1	2	3	4	5	6	7	8	9
1 Exhaustion	0.85	0.77	0.96	1								
2 Inadequacy	0.80	0.75	0.93	0.83**	1							
3 Cynicism	0.80	0.75	0.94	0.82**	0.82**	1						
4 Self-efficacy	0.84	0.77	0.96	-0.23**	-0.20**	-0.22**	1					
5 Self-esteem	0.94	0.80	0.98	-0.15**	-0.08*	-0.09*	0.63**	1				
6 Extraversion	0.70	0.68	0.87	-0.10*	-0.11**	-0.10*	0.10*	0.01	1			
7 Agreeableness	0.78	0.73	0.91	0.02	0.03	-0.02	-0.02	0.09*	0.06	1		
8 Conscientiousnes	0.75	0.70	0.91	-0.44**	-0.44**	-0.42**	0.10*	0.09*	-0.09*	-0.08*	1	
9 Neuroticism	0.73	0.69	0.91	0.38**	0.37**	0.36**	-0.11**	-0.02	-0.07	-0.03	-0.28**	1
10 Openness	0.80	0.75	0.93	-0.26**	-0.23**	-0.23**	-0.07	0.00	0.02	-0.02	0.13**	-0.22**

Note: \*\* correlations are significant at the  $p < 0.001$  level; \* correlations are significant at the  $p < 0.05$  level.

### 3.2. CFA to test the model



Confirmatory factor analyses (CFA) of the scales used in our model were performed to achieve evidence of the discriminant validity of these measures. **Table 3** shows the results of the CFA with the goodness-of-fit indices with personality factors as antecedent factors, self-esteem and self-efficacy as individual factors and with the three university burnout as outcome variables (Model 1, 10-factor model). In addition, the three alternative models are presented. The differences between the 10-factor model (Model 1) and the alternative Model 2 ( $\Delta RMSEA = 0.066$ ,  $\Delta CFI = 0.6$ ,  $\Delta GFI = 0.5$ ), and the alternative Model 3 ( $\Delta RMSEA = 0.010$ ,  $\Delta CFI = 0.3$ ,  $\Delta GFI = 0.2$ ), indicate that the study model fits with the data better<sup>[92]</sup>. However, the differences between the 10-factor model (Model 1) and alternative Model 4 were minimal ( $\Delta RMSEA = 0.06$ ,  $\Delta CFI = 0.2$ ,  $\Delta GFI = 0.2$ ). Therefore, it was examined the difference of the Chi-square statistics of the 10-factor model and the alternative Model 4 and it emerged that the difference between the Chi-square statistics was statistically significant ( $\Delta\chi^2 = 123.79$ ,  $\Delta df = 1$ ,  $p < 0.001$ ). As the 10-factor model has a lower Chi-square value, this model is considered to have a better fit to the data. Therefore, the aforementioned evidence supports the discriminant validity of the ten scales (**Table 3**).

**Table 3.** Confirmatory factor analysis results for the study model and alternative models for comparison.

Model	$\chi^2$ (df)	p	RMSEA	CFI	GFI	SRMR	AIC	BIC
<b>Model 1</b> 10-factor model: the ten study variables loaded onto ten separate factors	1484.4 (36)	0.00	0.069 (C.I. = 0.065–0.073)	0.90	0.90	0.039	291.482	357.098
<b>Model 2</b> The ten study variables loaded onto a single factor	1373.1 (34)	0.00	0.135 (C.I. = 0.115–0.128)	0.84	0.85	0.061	586.617	673.849
<b>Model 3</b> 8-factor model with three outcomes variables as a single factor	1672.36 (35)	0.00	0.079 (C.I. = 0.071–0.086)	0.87	0.88	0.068	456.365	591.713
<b>Model 4</b> 8-factor model with with self-efficacy and self-esteem without testing a mediation effect	1608.19 (37)	0.00	0.075 (C.I. = 0.070–0.081)	0.88	0.88	0.047	404.384	537.972

### 3.3. Structural model evaluation

To perform the multiple mediation analyses, the AMOS 26.0 software was used<sup>[93]</sup>. The different effects of the mediating variables included in the study could be tested individually and simultaneously<sup>[94]</sup>. The model presents the SBI-U factors (Exhaustion, Inadequacy, and Cynicism) as dependent variables, the Big Five factors (agreeableness, conscientiousness, openness, and neuroticism) as independent variables and self-efficacy and self-esteem as mediators.

All variables were entered as latent constructs, except for the SBI-U factors, which were entered as observed constructs. The bootstrapping method was used (i.e., 2000 samples) with bias-corrected confidence intervals (BC) in order to obtain stronger confidence interval limits for indirect effects (95% CI)<sup>[95]</sup>.

### 3.4. Directed effects

**Figure 1** shows the results of the mediation and more specifically the direct effects. It is clear that not all factors of the Big Five Theory are predictors of SBI-U in each of its sub-factors. Actually, the factor extroversion did not seem to have any significant effect (which is why it was excluded from the model), and the factor agreeableness seems to have only a direct negative effect on the mediator Self-esteem ( $\beta = -0.009$ ,  $p = 0.03$ ). The factors conscientiousness, openness and neuroticism, however, are strong predictors of all factors of SBI-U. Indeed, conscientiousness has direct and negative effects towards inadequacy ( $\beta = -0.37$ ,  $p$

< 0.001), cynicism ( $\beta = -0.34, p < 0.001$ ), and exhaustion ( $\beta = -0.35, p < 0.001$ ). Similarly, the openness factor showed direct and negative effects towards inadequacy ( $\beta = -0.13, p < 0.001$ ), cynicism ( $\beta = -0.13, p < 0.001$ ), and exhaustion ( $\beta = -0.15; p < 0.001$ ). The factor neuroticism had direct and positive effect for the factors inadequacy ( $\beta = 0.24, p < 0.001$ ), and negative effects on cynicism ( $\beta = -0.13, p < 0.001$ ) and exhaustion ( $\beta = 0.24, p < 0.001$ ). Furthermore, for the conscientiousness factor, a direct effect on the mediator self-efficacy ( $\beta = 0.09, p = 0.02$ ) emerged; whereas for the agreeableness factor, it emerged a direct and negative effect on the mediator self-esteem ( $\beta = -0.09, p = 0.03$ ). Finally, on the mediators, self-efficacy only predicts the factor exhaustion ( $\beta = 0.12, p < 0.001$ ), while self-esteem is a predictor of each of the factors negatively: inadequacy ( $\beta = -0.08, p = 0.02$ ), cynicism ( $\beta = -0.09, p = 0.01$ ) and exhaustion ( $\beta = 0.08, p = 0.02$ ).

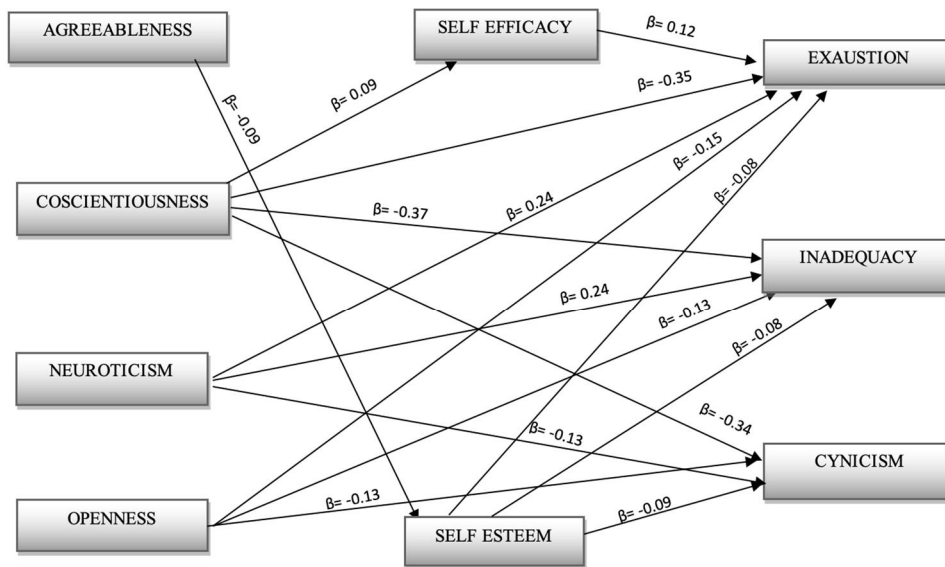


Figure 1. Structural model \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ ; non-significant links have not been reported.

### 3.5. The indirect effects of self-efficacy and self-esteem

To determine whether indirect effects were present in this study, the procedure explained by Hayes and Scharkow<sup>[91]</sup> was used. Bootstrapping was used to construct 95% CI with two-sided bias correction to assess indirect effects. As presented in Table 4, the bootstrap configuration elements do not exceed zero.

Table 4. Standardized indirect effects from personality factors to exhaustion, inadequacy and cynicism through self-efficacy and self-esteem.

Predictor	Mediator	Outcome	$\beta$	SE	BC 95% CI	
					LL	UL
Conscientiousness	→ Self-efficacy	→ Exhaustion	-0.09**	0.03	-0.166	-0.012
Conscientiousness	→ Self-efficacy	→ Inadequacy	-0.04***	0.03	-0.424	-0.297
Conscientiousness	→ Self-efficacy	→ Cynicism	-0.04**	0.03	-0.404	-0.279
Agreeableness	→ Self-esteem	→ Inadequacy	-0.09***	0.05	-0.157	-0.014
Agreeableness	→ Self-esteem	→ Cynicism	-0.05***	0.04	-0.676	-0.510

Note: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ .

The results showed two different types of mediation. Specifically, it emerged a partial mediating effect of conscientiousness through self-efficacy on exhaustion ( $\beta = -0.09, p < 0.001, 95\% \text{ CI } [-0.166, -0.012]$ ), on inadequacy ( $\beta = 0.04, p < 0.001, 95\% \text{ CI } [-0.0424, -0.297]$ ) and on cynicism ( $\beta = 0.04, p < 0.001, 95\% \text{ CI } [-0.404, -0.279]$ ). Whereas, it is revealed a total mediating effect of agreeableness through self-esteem on inadequacy ( $\beta = -0.09, p < 0.001, 95\% \text{ CI } [-0.157, -0.014]$ ) and cynicism ( $\beta = 0.05, p < 0.001, 95\% \text{ CI } [-0.676, -0.510]$ ). These findings suggested that conscientiousness and self-efficacy are important in the management of university burnout and that self-esteem could address the college student's sense of inadequacy seeking to adapt to the university environment and foster less cynical and detached behaviour.

### 3.6. Multigroup analysis: A comparison between the different effects between the pandemic and the recovery of university life

To test the moderating effect, two groups were considered: college students surveyed during the pandemic and college students surveyed after the pandemic. The invariance of the structural model was tested across the three multigroup, considering correct the model with measurement weights constrained and comparing the model with the unconstrained structural coefficients to the constrained model (i.e., with structural weights constrained).

In **Table 5**, it is showed the structural models with constrained coefficients, that presented a significant worse adjustment to groups compared to the model with free coefficients because  $p\Delta\chi^2 < 0.001$ .

These results supported that the causal model, regarding the effect of personality traits on academic burnout, was not invariant across groups of college students surveyed during and after the pandemic and their interaction. Therefore, the null hypothesis was rejected for all hypotheses supporting differences in structural models.

**Table 5.** Multigroup analysis: test for measurement invariance across university students interviewed during the pandemic ( $N = 316$ ) and university students interviewed after the pandemic ( $N = 292$ ).

Measurement model	$\chi^2$	$df$	$\Delta\chi^2$	$\Delta df$	NFI	CFI	RMSEA
Multigroup model for the total sample	1363.52	30			0.90	0.93	0.05
Unconstrained model	1620.84	45	257.32	15	0.90	0.93	0.05
Measurement model	1728.18	55	364.66	25	0.89	0.93	0.05
Structural model	1820.32	60*	456.80***	30	0.89	0.92	0.05

Note: \*\*\*  $p < 0.001$ , \*  $p < 0.01$ , NFI = Normed fit index, CFI = Comparative fit index, RMSEA= Root mean square error of approximation.

The results of the multi-group invariance resulted in investigating whether there was a significant effect of personality factors, self-esteem and self-efficacy between the two groups of student respondents on academic burnout and whether this had a significant effect on perceived stress.

The results supported that in the second interviewed group, conscientiousness had a significant effect on self-efficacy ( $\beta = 0.09, p < 0.05$ ), cynicism ( $\beta = -0.39, p < 0.001$ ), burnout ( $\beta = -0.40, p < 0.001$ ), and inadequacy ( $\beta = -0.40, p < 0.001$ ).

However, the findings also revealed that in the second group of students interviewed, there was a greater effect of neuroticism on exhaustion ( $\beta = 0.30, p < 0.001$ ), inadequacy ( $\beta = 0.26, p < 0.001$ ), and cynicism ( $\beta = 0.31, p < 0.001$ ), suggesting that those with emotional instability suffered more during the pandemic and that the effects were visible in the post-pandemic.

Additionally, a sense of self-efficacy was found to have a greater impact on cynicism during the pandemic in the first group and no impact was observed in the second group ( $\beta = 0.28, p < 0.001$  vs  $\beta = 0.02, ns$ ).

**Table 6.** Summary of path analysis between variables of our model among university students interviewed during the pandemic ( $N = 316$ ) and university students interviewed after the pandemic ( $N = 292$ ).

Paths of interest			Students interviewed during the pandemic ( $N = 316$ )		Students interviewed after the pandemic ( $N = 292$ )	
			B (SE)	<i>p</i>	B (SE)	<i>p</i>
Conscientiousness	→	Self-efficacy	-0.04	ns	0.09	<0.05
Agreeableness	→	Self-esteem	-0.07	ns	-0.08	ns
Self-efficacy	→	Exhaustion	0.07	ns	0.09	<0.05
Conscientiousness	→	Exhaustion	0.06	ns	-0.40	<0.001
Neuroticism	→	Exhaustion	0.01	ns	0.30	<0.001
Neuroticism	→	Inadequacy	-0.02	ns	0.26	<0.001
Openness	→	Exhaustion	-0.12	<0.05	0.11	<0.05
Openness	→	Inadequacy	-0.03	ns	0.12	<0.05
Self-efficacy	→	Cynicism	0.28	<0.001	0.02	ns
Neuroticism	→	Cynicism	-0.03	ns	0.31	<0.001
Conscientiousness	→	Cynicism	0.04	ns	-0.39	<0.001
Conscientiousness	→	Inadequacy	0.06	ns	-0.40	<0.001
Openness	→	Cynicism	-0.04	ns	-0.12	<0.05
Self-esteem	→	Inadequacy	0.29	<0.001	0.02	ns
Self-esteem	→	Exhaustion	0.32	<0.001	0.04	ns

Note: ns = not significant.

## 4. Discussion

The study aimed at examining the potential mediating role of the self-efficacy and self-esteem in the impact of the five personality factors on academic burnout. In addition, a comparison between students in the COVID-19 and post-COVID-19 period was examined in an innovative way compared to the literature.

The phenomenon of burnout is one of the health issues of major concern to the global community. Several authors found that regardless of cultural or geographic context, or political differences and academic grades, academic burnout is increasingly present. It is estimated that between 40% and 50% of students and health professionals have some levels of burnout<sup>[96]</sup>. The findings of the present study fully support the trend just outlined, identifying average scores for the entire sample that are quite high. For each of the factors related to inadequacy, cynicism and exhaustion, students showed high academic burnout, compared to the standard normative score.

Hence, considering the literature evidence, it was therefore proposed to examine the predictive role of the five personality factors towards burnout. The results from the mediation analysis suggested that the Big Five Theory factors were not all significant predictors of academic burnout factors. Indeed, the extroversion factor did not emerge as a significant predictor for any of the academic burnout factors, probably because the significant effect was already very weak in correlation. We can perhaps think that the extroversion trait, referring to a personality trait characterized by energy, cheerfulness, and sociability, may have suffered the effects of the pandemic, and therefore may have failed for this reason. Indeed, in the literature, extroversion is connected to a positive emotion, while for example neuroticism is connected to a negative emotion. Furthermore, reference is made to the fact that these traits and the emotions that are associated with them are independent, so one may prove to be a predictor of burnout while the other is not.

A recent literature review and meta-analysis<sup>[97]</sup> would show that although the negative association is the most frequent, some studies emphasize a directly proportional association between burnout and extroversion<sup>[98]</sup>, cynicism<sup>[99]</sup> and reduced professional realization<sup>[100-104]</sup>.

On the contrary, the other personality factors turn out to be very good predictors of our model. For example, agreeableness reported an important negative effect on burnout, quite in line with longitudinal studies on the topic. Agreeableness can indeed be considered as a protective factor of the dimensions of emotional exhaustion, depersonalization and reduced professional achievement and is closely related with a sense of cooperation, tolerance, and avoidance of conflict on problematic issues.

The tendency of those who have adequate or high levels of agreeableness is exactly the kind of interpersonal relationships and positive climate that can protect students and employees from developing burnout and increased depersonalization<sup>[105,106]</sup>.

A negative association between conscientiousness and burnout has been reported, as suggested by several studies. The conscientious trait reflected in precise, organized and disciplined people who comply with rules and work hard to achieve success, and it is this perseverance in work and success orientation that protected these people from developing emotional exhaustion<sup>[107]</sup> and low personal fulfilment. Although most studies report a negative relationship between conscientiousness and burnout dimensions, other studies support an inverse effect relationship, whereby greater commitment and effort represent greater levels of Burnout and Depersonalization<sup>[108,109]</sup>. In relation to the neuroticism factor, on the other hand, the literature and the present study generally report a positive association with the various burnout dimensions. Since neuroticism can be defined as emotional instability, negativity or maladjustment, lack of self-control, poor ability to cope with psychological stress and a tendency to recriminate, the emotions and behaviors usually generated are highly maladaptive. These characteristics also interfere with functioning and job satisfaction, constituting a significant risk to the development and maintenance of burnout<sup>[110-113]</sup>.

Finally, Openness also appears to be a predictor of burnout, reporting a specific negative association with the dimensions considered. Similarly, to the previous factors, personal characteristics related to openness (being intellectually more curious about novelty and open-mindedness and a predisposition towards independence)<sup>[114,115]</sup>, serve as protection against failure and burnout due to emotional exhaustion.

The findings from most of the studies examined and used as a basis for comparison with the literature, showed clear references to organizational contexts and very few to the school or academic context, except in relation to teachers or staff engaged in administration. While it is appropriate and desirable to find similarities between work-related and academic burnout, our study is intended to fill a gap and provide theoretical and practical guidance concerning predictors and possible actions that could be taken. The effect that personal characteristics generally have, in fact, has a large influence on the training and support interventions that can be designed and implemented in all school grades. These actions would find positive consequences both immediately and in a transversal and longitudinal manner in the various and subsequent school and life paths.

In this panorama, personal and improvable skills such as self-efficacy and self-esteem gain additional relevance. In the specific case of our study, these variables emerged as important mediators, but not for all the factors considered. Our results suggest that conscientiousness and self-efficacy are important tools in the management of university burnout, in line with most studies that include self-efficacy to decrease and better manage students' inadequacy, cynicism and burnout. Therefore, the results seem to suggest that having a high degree of conscientiousness as a personality trait could affect and determine a good amount of confidence in one's own abilities and skills, which in turn can create an ideal condition that discourages negative consequences such as burnout or negative academic experiences. Our findings were consistent with the others

who reported the mediator and protective role performed by self-efficacy. Indeed, as also supported by Yao et al.<sup>[59]</sup> and Shakeel et al.<sup>[58]</sup>, individuals with more stable personality traits also usually reported higher levels of self-efficacy, which therefore resulted in lower levels of burnout and generally fewer negative consequences.

In our study, self-esteem also plays as a protective factor and in connection with agreeableness performs a multiplier effect in managing and containing academic burnout. These findings are significant due to underline the protective and mediating role that this personal resource could have on negative experience, like academic burnout.

The findings suggested that high and adequate levels of agreeableness, combined with high levels of self-esteem make it easier to deal with the sense of inadequacy experienced by university students trying to acclimatise to the university environment, in favour of less cynical and detached behaviour<sup>[112]</sup>. These results supported the hypothesis that self-esteem was an important mediator and protective factor against the negative consequences and for the individual well-being, as it was reported in the before-mentioned studies. Indeed, although the literature on the topic shortages studies that directly examine the mediating role of self-esteem between personality factors and academic burnout, self-esteem proved to be fundamental in the relationship between personality and social cynicism (similar to one of the burnout factors)<sup>[74]</sup> and between Big Five personality traits and subsequent depressive symptoms<sup>[75]</sup>. In conclusion, the data seem to suggest the important role that personality factors, self-efficacy and self-esteem play in predicting and “protecting” against the negative consequences of academic burnout. The total effects from the mediation analysis indeed suggest that these variables are important and should be carefully considered when dealing with an issue such as academic burnout. These results also aid in the construction and implementation of possible activities and policies aimed at improving academic life.

In an innovative way compared to the literature, our study also proposed a two-wave comparison of students’ conditions in the COVID-19 and post-COVID-19 period. This comparison using a multi-group analysis provided some interesting results and insights.

This multi-group analysis examined the impact of the COVID-19 pandemic on the management of stress and academic burnout. The evidence showed that conscientiousness becomes an important element and factor in the post-COVID-19 phase, since it has a controlling effect and reduces perceived stress<sup>[69,116–118]</sup>. Similarly, however, in the post-COVID-19 period, more emotional instability as a personality trait, also worsened by the pandemic and related experiences, having a greater influence on each of the burnout factors. This result was not found in the first wave, and it emphasises how emotion management and a focus on this aspect can improve students’ quality of life and general well-being in both life and school paths. This finding is likely one of the most relevant, also supported by the absence of the protective effect of self-efficacy, which is missed and has no effect especially on cynicism.

## **5. Conclusions**

The current study examined how the university student experience is strongly characterized by academic burnout. A deeper understanding of this phenomenon implies a focus and interest also on academic well-being and how it can be sustained and evaluated, especially in learning environments. This research allowed the measurement of the burnout in students also considering the pandemic and the lockdown, further allowing for the identification of possible personal risk and protective factors. Studies such as this provide valuable information for educators or all stakeholders who want to contribute to training and educational pathways in a way that is certainly more holistic, equitable and accessible to all.

The results reveal a very high incidence of academic burnout, both in comparison to normative data and previously available studies, suggesting a possible effect of the COVID-19 period on student well-being in the medium term. Several factors are predictive of burnout. At the individual level, we identified the contribution of personality traits in predicting academic burnout. Specifically, individuals with high cooperation and friendliness, high open-mindedness and experience, and high responsibility are less vulnerable to experiencing such negative and stressful experiences, in contrast to those with greater emotional instability who exhibit a greater tendency to experience inadequacy, cynicism and burnout.

The results of the present study provide guidance in this direction by detailing some predictors and mediators that may influence and thus modify the impact of academic burnout on university students' lives. Enhancing personal characteristics or some more traditional soft skills is feasible through training interventions and will produce useful and expendable results in different areas of life. This offers an opportunity not only to support students' overall academic performance, but also to carefully plan an ethically and socially sustainable university education.

## **6. Limitations and future research**

Although the present study is carefully designed and its findings are encouraging, some limitations are not absent, which may nevertheless provide insight for future investigations and insights.

Firstly, despite an acceptable sample size with a sufficiently good differentiation, the study is not translating into a comprehensive study with the aim of verifying and measuring differences and similarities in different academic contexts. Future studies could focus on this and provide an even more comprehensive overview.

A further limitation concerns the choice of predictors, specifically the five factors of the Big Five Theory. These predictors, with a long-standing tradition for job burnout, could explain academic burnout only to a limited extent. In addition to this, although the analysis of mediation and moderation emerges within the examined model, at the same time the weakness of some predictors emerges. Future research could thus focus on identifying additional predictors, including contextual and social ones. Furthermore, it could be highlighted that the use of a short scale for personality assessment represented a possible limitation. Although the literature reported an acceptable result for the scale used in relation to the amplitude of the assessed construct, given the importance of the five personality types considered, an extended version of the instrument could be evaluated in future research. Longitudinal studies could also provide more precise indications on the predictive power of these factors on academic burnout and in relation to specific contingent situations.

Another limitation is that being a cross sectional study done at two different times in the same setting, we cannot be sure that all participants participated only once in the study, and this bias is recurrent in this type of study.

Finally, another potential limitation is the generalizability of these results. Indeed, since two distinct but directly pandemic-influenced moments (during and post-COVID-19) are analyzed in the present study, one limitation might be that these results can also be verified and confirmed independently of the pandemic.

In any case, the results of this study provide an important contribution to the assessment of the physical and psychological health situation of these students in the period including and immediately following COVID-19 and emphasized the importance of investing in and improving personal competences through training and intervention courses that are tailored to the purpose. Enhancing these skills would indeed have an important impact on the students, not only in terms of quality of life, but also in a transversal and longitudinal perspective in the following life and school paths.

## Author contributions

Conceptualization, SP and SDN; methodology, MM, SP and SDN; software, SP, MM, and CM; validation, SP, MM, and SDN; formal analysis, SP and MM; investigation, RS and CM; data curation, RS, CM, SP, MM and SDN; writing—original draft preparation MM, SP, SDN, CM, and RS; writing—review and editing, MM, SP and SDN, supervision SP and SDN; project administration SP and SDN. All authors have read and agreed to the published version of the manuscript.

## Institutional review board statement

The study was carried out in accordance with the Declaration of Helsinki and the protocol was authorized by the Internal Ethics Committee of the Department of Education Sciences (Psychology Section) of the University of Catania (Ierb-Edunict-2020/2); the data were collected between May 2020 and October 2021 and the relevant research procedures followed all the guidelines of the AIP (Italian Psychology Association) and its Ethics Council.

## Informed consent statement

Informed consent was obtained from all subjects involved in the study.

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## Conflict of interest

The authors declare no conflict of interest.

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