
Covid-19 outbreak: What impact of the lockdown on college students' academic path and attitudes toward studying?

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✎ **ABSTRACT.** Questo studio ha analizzato l'impatto che il *lockdown*, come conseguenza della pandemia da Covid-19, ha avuto sul percorso accademico e sugli atteggiamenti nei confronti dello studio negli studenti universitari italiani. I risultati hanno evidenziato un incremento nei livelli di *studyholism* (ossessione per lo studio), una diminuzione nell'intenzione di abbandonare gli studi e nessun cambiamento statisticamente significativo nei livelli di *study engagement* (motivazione/piacere nei confronti dello studio). Inoltre, è aumentato il tempo dedicato allo studio giornalmente, ma è diminuito il numero di giorni di studio settimanale. Infine, l'intolleranza per l'incertezza è emersa come predittore di *studyholism*, fornendo supporto alla sua concettualizzazione come disturbo internalizzante.

✎ **SUMMARY.** Many countries imposed the lockdown to contain the Covid-19 pandemic, with the consequent closure of schools and a great uncertainty concerning the health, economic, and academic situation. We aim to analyze the impact of the lockdown on college students' academic path and attitudes toward studying, including studyholism (or obsession toward studying), study engagement, and dropout intention. We gathered 6075 Italian college students. We performed one-sample t-tests (with students gathered before the pandemic as the reference group), paired-samples t-tests, and a path analysis model. During the lockdown, students experienced higher levels of studyholism, lower intention to dropout, and no change in their study engagement levels. Also, they increased their time spent studying daily but decreased the days per week of studying. Finally, we found that intolerance for uncertainty is a good predictor of studyholism, which in turn is a positive predictor of the impairment in study quality and motivation. Universities should provide students with psychological interventions to reduce their studyholism and increase their tolerance for uncertainty, aiming to increase their resilience, also in case of another pandemic or a new wave of Covid-19. From a theoretical perspective, the definition of problematic overstudying as an internalizing disorder is further supported.

Keywords: COVID-19, OCD, Student, Study, Study addiction, Studyholism

INTRODUCTION

In December, at the end of 2019, a novel Coronavirus arose in China (Wuhan, Hubei province), causing a new type of pneumonia (Ryu & Chun, 2020; Wang, Horby, Hayden & Gao, 2020). Due to the person-to-person transmission, including transmission from asymptomatic people (Chan et al., 2020; Rothe et al., 2020), the virus rapidly spread worldwide and became a global public health emergency. In Italy, a little city in North Italy registered the first case on February 20, 2020 (Gagliano et al., 2020). On November 5, 2020 (at 10.36 a.m.), Italy counted 759,829 confirmed cases and 39,412 deaths linked to Covid-19 (WHO, 2020).

To contain the spread of the virus, the Italian government adopted various measures, including the limitation of movements. However, in March 2020, it finally decided on a prolonged lockdown. Therefore, schools – including universities – were closed and great uncertainty concerning when and how they would have been re-opened arisen. Moreover, lessons, exams, traineeships, and graduations have been moved to an online format, even if some teachers and students could not have been well prepared, also from a technological point of view (e.g., proper internet connection and equipment). Moreover, since universities provided information gradually based on the epidemiologic developments, there was great vagueness concerning the format of the exams (some changed from written to oral, and vice versa) and of the graduations, the possibility of doing the planned traineeships, and even the format of the lessons and exams in September. Also, jointly to the academic path's worries, health anxiety symptoms could have increased in students – at least in the ones with pre-existing health anxiety – due to the life threat posed by the Covid-19, with possible negative consequences for the quality of the study and motivation.

Hence, we supposed that college students could have experienced negative academic outcomes during the lockdown, especially if characterized by a lack of tolerance for uncertainty since they could have increased their levels of studyholism (or obsession toward study; Loscalzo & Giannini, 2017). Studyholism, in turn, could have led to an impairment in study quality and motivation during the lockdown, in contrast with study engagement (or intrinsic motivation toward study) that could have played a protective role against academic impairment.

Studyholism is a new potential clinical condition

conceptualized as being more similar to an obsessive-compulsive related disorder than a behavioral addiction (i.e. study addiction; Atroszko, Andreassen, Griffiths & Pallesen, 2015). More specifically, Loscalzo and Giannini (e.g., 2017, 2018a, 2018b) defined studyholism as an obsessive-compulsive related disorder (OCD-related disorder) made up of two components: i) obsessive-compulsive symptoms related to study; ii) high or low study engagement (including inner motivation toward study). In fact, Loscalzo and Giannini (2017) theorized two types of studyholics: engaged studyholics and disengaged studyholics. They are both characterized by high levels of studyholism; however, while the first type also has high levels of study engagement, the other type has a low level of this positive attitude towards study.

It should be noted that the conceptualization of studyholism as an OCD-related disorder is based on both theoretical considerations and empirical findings – including psychometric analyses. However, Loscalzo and Giannini (e.g., 2018a, 2018b, 2018c) point out that the literature about the specific features of problematic overstudying is still too scant to reach any firm conclusion about its internalizing and/or externalizing nature, and other studies going beyond the addiction conceptualization should be performed to shed light on its real nature. From a theoretical perspective, Loscalzo and Giannini (2018a) made a critical comparison between the DSM-5 diagnostic criteria for OCD and substance use disorders. Moreover, the psychometric analyses conducted on the Studyholism Inventory (SI-10; Loscalzo & Giannini, 2017, 2020a; Loscalzo, Giannini & Golonka, 2018) provided preliminary support for the conceptualization of problematic overstudying as being better conceptualized as an internalizing rather than an externalizing disorder. Next, Loscalzo and Giannini (2019) and Loscalzo (2021) conducted a study – respectively, on college and adolescent students – to test some of their suggested antecedents and outcomes of studyholism. Among their main findings, the results supported the conceptualization of studyholism as an OCD-related disorder since worry, which is an internalizing feature contributing to OCD (Comer, Kendall, Franklin, Hudson & Pimentel, 2004), is a strong predictor of studyholism. Moreover, they found support for the conceptualization of both disengaged and engaged studyholics as clinical types of studyholism that differ for their level of study engagement, but also for the area (academic, social, academic and social functioning) in which they are most impaired. Finally,

Loscalzo and Giannini (2020b) suggested a tentative proposal for studyholism DSM-like criteria based on their OCD-related disorder conceptualization.

On studyholism prevalence, Loscalzo and Giannini (2020a) and Loscalzo (2019) found a considerable prevalence of high studyholism in Italian college students, hence suggesting the need to address this new potential clinical condition, especially considering that it is associated with a higher dropout intention (Loscalzo, 2021; Loscalzo & Giannini, 2019). Moreover, regarding the Covid-19 pandemic specifically, Loscalzo, Ramazzotti, and Giannini (2021) found through a quali-quantitative pilot study that students who reported negative consequences for their study due to the pandemic have higher levels of studyholism than students who did not report this negative effect. In line with this, students who did not report positive effects on their study reported higher studyholism than students acknowledging this type of effect.

There is increasing literature concerning the psychological correlates of the Covid-19 pandemic, also on students. For example, Ma et al. (2020), on a large sample of Chinese college students, showed that about half of the participants had mental health problems, such as acute stress, anxiety, and depressive symptoms. Moreover, the longitudinal study by Li, Cao, Leung and Mak (2020) highlighted that, after two weeks of confinement, students experienced an increase in negative affect, anxiety and depressive symptoms. In the Italian context, Nania, Dellafiore, Caruso and Barello (2020) highlighted that university students' mental health is affected in the face of public health emergencies like the Covid-19 outbreak. In line with this, Romeo, Benfante, Castelli and Di Tella (2021), by comparing university students and general workers on psychological variables, showed that students experienced higher levels of anxiety and depression than workers. Though, to the best of our knowledge, there are no studies that analyzed the effect of the lockdown on college students' attitudes toward studying, including their obsessive thinking about the study (or studyholism), study engagement, time spent studying, and dropout intention. Hence, we aim to explore these aspects in a broad sample of Italian college students gathered during the lockdown. This study could provide valuable insights for university-based interventions to manage the negative academic outcomes caused by the lockdown. Moreover, we aim to analyze if intolerance for uncertainty is a good predictor

of studyholism. It is a feature of internalizing disorders, including OCD (e.g., Baldwin, Whitford & Grisham, 2017; Carleton, Collimore & Asmundson, 2010; Gentes & Ruscio, 2011; Lind & Boschen, 2009; McEvoy & Mahoney, 2012); hence, this could provide further evidence for the conceptualization of problematic overstudying as an internalizing disorder (or as an OCD-related disorder).

METHOD

Participants

We got the participation of 6075 Italian college students aged between 18 and 68 years (M age = 23.60 ± 5.02 , 74.6% females). The participants lived across all Italy; though, most of them live in Tuscany (80.3%). Moreover, all the years of study are represented: first year, 19.4%; second year, 17.1%; third year, 29.0%; fourth year, 14.3%; fifth year, 18.9% (1.3% is missing). About the area of study, most of the main courses are represented; among the most spread there are: Educational studies, 9.8%; Economics, 9.5%; Engineering, 8.4%; Psychology, 7.8%; Social Sciences, 6.6%; Medical Studies, 6.5%; Architecture and Design, 6.1%; and Law, 5.2%. In this study, we used the sample for different analyses compared to other papers (Loscalzo & Giannini, 2021a, 2021b; Loscalzo et al., 2021) that are grounded on the same data.

Materials

Ad hoc questions about the quarantine measures and the impact on the didactic. We designed a questionnaire including ad hoc questions aiming at evaluating: i) the characteristics of the home (e.g., people living with the students); ii) the agreement with and the respect for the quarantine measures established by the Italian government; iii) Covid-19 symptoms (e.g., having experienced symptoms) and beliefs about the virus (e.g., it is a natural virus); iv) impact of the quarantine on the didactic (e.g., satisfaction with the online didactic); v) impact on the study (e.g., traineeship interrupted, hours of studying per day). For this study, we used the questions gathered from sections iv and v.

Studyholism Inventory (Loscalzo et al., 2018). It is a 10-item self-report scale made up of two scales, each one comprehending five items (one of which is a filler):

studyholism and study engagement. The response format is a 5-point Likert scale ranging between 1 (*Strongly disagree*) and 5 (*Strongly agree*). The SI-10 also has a head-sheet for collecting questions about study habits (e.g., GPA, time spent studying generally and before exams). Currently, the SI-10 is available in Italian, English, Polish, Spanish, and Croatian languages. In this study, we administered the Italian version, which has good psychometric properties (Loscalzo et al., 2018; Loscalzo & Giannini, 2020a). In the current sample, the reliability of the SI-10 is good for both studyholism ($\alpha = .84$) and study engagement ($\alpha = .82$).

Health Anxiety Questionnaire (HAQ); Lucock & Morley, 1996). We administered the Italian version (Melli, Coradeschi & Smurra, 2007) of the HAQ. It is a 21-item self-report scale whose response format is a 4-point Likert scale ranging between 1 (*Never or rarely*) and 4 (*Almost ever*). It allows evaluating, through four scales, the fear of diseases and death, interference with daily life, concern about one's health, and seeking reassurance. It is also possible to calculate a total score. In the current sample, the reliability for the HAQ total score is good ($\alpha = .93$).

Intolerance of Uncertainty Scale – Revised (IUS-R); Carleton, Norton & Asmundson, 2007). It is a 12-item self-report scale whose response format is a 5-point Likert scale ranging between 1 (*Completely disagree*) to 5 (*Completely agree*). Its total score allows evaluating the intolerance for uncertainty. We administered the Italian version (Bottesi, Noventa, Freeston & Ghisi, 2019). In the current sample, the reliability for the IUS-R total score is good ($\alpha = .89$).

Procedure

The first page of the online questionnaire presented the information required by the informed consent, and participants were asked to check a box to confirm that they agreed to take part in the research by filling out the questionnaire. On the following pages, we asked for some demographic data (e.g., gender, age), and we next presented the ad-hoc questions and the scales described in the previous section, as well as other instruments that we did not use in this paper.

To gather participants, thanks to our university office's collaboration, Florentine students received an invite (including the link to the questionnaire) to their institutional email addresses. Moreover, we spread the link

on Facebook university groups aiming to reach students from other Italian cities.

The approval from the Ethical Committee of the University of Florence was obtained.

Data analysis

We performed the analyses using SPSS.26 (Chicago, IL, USA) and AMOS.22.

First, we analyzed the descriptive statistics and frequencies for the ad-hoc questions concerning the impact of the Covid-19 pandemic on the didactic and on students' academic careers. Moreover, through ANOVAs, we investigated differences between the students who refused to take exams in the online format and the ones who take their planned exams anyway on studyholism, study engagement, health anxiety, and tolerance for uncertainty.

Next, to evaluate if the levels of studyholism, study engagement, and dropout intention changed during the Covid-19 outbreak, we performed three one-sample *t*-tests. The Mean reference values for these analyses are reported in Loscalzo's (2019) prevalence study about studyholism and study engagement in Italian college students and, for dropout intention, in Loscalzo and Giannini (2019). Then, to evaluate if there has been an increase/decrease in the time spent studying, we performed two paired-sample *t*-tests using the ad-hoc questions included in the questionnaire. We used a parametric test since the ad-hoc questions proved to be normally distributed. More specifically, for each variable, the values of skewness and kurtosis are, respectively: .59 and .40 (hours per day of study during Covid-19), .60 and .61 (hours per day of study before Covid-19), $-.58$ and .09 (days per week of study before Covid-19), -1.04 and .58 (days per week of study during Covid-19).

Finally, we tested a path analysis model (Maximum Likelihood estimate method) aimed at evaluating the effect of health anxiety and intolerance for uncertainty on studyholism and study engagement, as well as the effect of studyholism and study engagement on some study-related variables (i.e., impairment of the quality of studying, impairment of concentration in studying, decrease in the desire for studying, decrease in the motivation for studying). To evaluate the model fit, we referred to the values provided by Byrne (2001), Hu and Bentler (1999), and Reeve et al. (2007).

RESULTS

Covid-19 impact on didactic and studying behaviors

First, we analyzed the descriptive statistics and the frequencies for the ad-hoc questions concerning the impact

of the Covid-19 outbreak on the didactics and the students' academic careers (see Table 1). The results highlighted that most teachers promptly adopted online lessons during the first month of the lockdown (82.4%). Also, even if a few provided just PowerPoint presentations (3.6%) or audio recordings (5.7%), almost all teachers tried to reach their students using simultaneously written and audio supplies,

Table 1 – Covid-19 outbreak impact on didactics and students' academic career (n = 6075)

Question	Option	%
After teaching's suspension, your teachers have provided you with online lessons?	Yes	82.4
	No	1.1
	Just a few	16.5
If your teachers have done online lessons, which typology was mainly used?	PowerPoint presentations	3.6
	Audio recordings	5.7
	PowerPoint presentations + Audio files	16.2
	PowerPoint presentations with audio included	42.6
	Streaming lessons without uploading on website	42.6
	Streaming lessons with uploading on website	15.1
Are your teachers generally available when requesting clarifications?	Yes	65.1
	No	4.2
	I have not contacted any professor	30.7
Have your teachers activated alternative ways for students' meetings?	Yes	55.2
	No	5.9
	Don't know	39.0
Did you have exams scheduled for March or April?	Yes	53.9
	No	46.1
If you had scheduled exams, will you still take/have you taken your exam even if online?	Yes	29.4
	No	24.1
	Not applicable	46.5
Were you planning your degree thesis for March or April?	Yes	4.2
	No	95.8
Are you planning your degree thesis (bachelor's or master's) by 2020?	Yes	31.6
	No	68.4
If you had planned your degree, do you think the health emergency will cause a delay in the graduation date?	Yes	25.1
	No	9.9
	Not applicable	65.1
Do you have a pre-graduate or post-graduate internship that has not started due to the health emergency?	Yes	16.7
	No	83.3
Do you have a pre-graduate or post-graduate internship that was interrupted due to the health emergency?	Yes	12.0
	No	88.0

including streaming lessons; moreover, they have been generally available to students' requests for clarifications. However, the students reported having had just an average level of satisfaction with those lessons ($M = 4.65 \pm 1.58$; the response format was a Likert scale ranging between 1 and 7). Moreover, teachers have generally been available for clarifications, and they have activated online meetings for students willing to ask for clarifications.

Universities, besides lessons, foresee exams, internships, and graduations. Among our participants, more than half of the sample scheduled exams for April and May before the Covid-19 outbreak; though, many of them decided not to take the exams in the online format. Moreover, the Covid-19 pandemic impacted internships: 16.7% of the participants reported not having started a planned internship, while 12.0% reported having had to interrupt it. Finally, even if 4.2% of students planned to get their degree by 2020, most of them believe that the Covid-19 pandemic will have caused a delay in their graduation. Among the few whose degree was established for March or April 2020, the satisfaction with the method used for their graduation was not high ($M = 3.97 \pm 1.90$; the response format was a Likert scale ranging between 1 and 7). About this data, it should be noted that graduation generally regards just third- and fifth-year students. Moreover, an internship is required just for some courses, and there are also differences concerning the year(s) in which it must be performed. Hence, this explains why the questions about graduation and internship apply just to a minority of the sample. In the same line, a spring examination session is present just for some courses. This explains why almost half of the participants stated that they did not have exams scheduled for April and May 2020. However, we deepened the analysis concerning the exams by comparing the students who refused to take exams online with those who take their planned exams on the variables analyzed in this study. The ANOVA analyses showed that who take exams has lower levels of studyholism [$M = 14.21 \pm 3.98$; $F_{(1, 3250)} = 18.94, p < .001$; $\eta^2 = .006$], higher levels of study engagement [$M = 14.68 \pm 3.46$; $F_{(1, 3250)} = 23.75, p < .001$; $\eta^2 = .007$], lower health anxiety [$M = 41.59 \pm 12.57$; $F_{(1, 3250)} = 4.42, p = .036$; $\eta^2 = .001$] and lower tolerance for uncertainty [$M = 33.32 \pm 9.85$; $F_{(1, 3250)} = 5.71, p = .017$; $\eta^2 = .002$] than students who refused to take the planned exams during the lockdown (*Mean* values are, respectively, 14.80 ± 3.73 , $M = 14.08 \pm 3.54$, $M = 42.52 \pm 12.53$, and $M = 34.16 \pm 10.16$). Though, the effect size is small, especially for

health anxiety and tolerance for uncertainty.

In sum, even if teachers have provided the required online lessons avoiding the courses' interruption, many students experienced a negative impact on their curriculum since many did not take the planned exams, could not start or complete the internships, and expected a delay in their graduation day.

The impact of the Covid-19 pandemic on studying behaviors and attitudes toward the study

To evaluate if the levels of studyholism and study engagement changed during the Covid-19 outbreak, we performed two one-sample *t*-tests. *Mean* reference values are the ones reported by Loscalzo (2019) in her study about studyholism prevalence in a sample of 5159 Italian college students. The results (see Table 2) highlighted that Italian students, during the Covid-19 pandemic, reported higher levels of studyholism and no change in their study engagement. Next, to evaluate if there has been a change in dropout intention, we performed an additional one-sample *t*-test, using as reference value the *Mean* reported by Loscalzo and Giannini (2019), and we found that it has decreased during the Covid-19 pandemic (see Table 2).

Finally, to evaluate if there has been a change in the time spent studying, we performed two paired-sample *t*-tests using the ad-hoc questions included in the questionnaire. The results (see Table 3) showed that, during the lockdown, students increased the hours of studying per day while decreased the number of days of studying per week.

Psychological variables as predictors of study-related behaviors

Finally, we tested a path analysis model to analyze if health anxiety and intolerance for uncertainty predict studyholism and study engagement, and if studyholism and study engagement predict study quality and motivation during the lockdown. As a preliminary step, we analyzed the correlation between studyholism and study engagement ($r = .09, p < .001$).

The model has a good fit: $\chi^2/df = 6.04, p < .001$; GFI = .998; CFI = .998; RMSEA = .029, 90% CI = .021-.037. Moreover,

Table 2 – One-sample *t*-tests

		<i>n</i>	<i>M (SD)</i>	<i>t</i>	<i>df</i>	<i>p</i>
Studyholism	before Covid-19 *	5159	14.04(3.98)	2.96	6074	.003
	during Covid-19	6075	14.19(3.94)			
Study engagement	before Covid-19 *	5159	14.50(3.54)	.55	6074	.583
	during Covid-19	6075	14.52(3.54)			
Dropout intention	before Covid-19 #	1958	6.43(3.58)	-12.76	6074	<.001
	during Covid-19	6075	5.92(3.11)			

Legenda. *df* = degree of freedom; * = *Mean* reference value from Loscalzo (2019); # = *Mean* reference value from Loscalzo and Giannini (2019).

Table 3 – Paired-sample *t*-tests

		<i>n</i>	<i>M (SD)</i>	<i>t</i>	<i>df</i>	<i>p</i>	η^2
Hours/studying day*	before Covid-19 *	6059	4.55(2.15)	5.52	6058	<.001	.005
	during Covid-19	6059	4.36(2.49)				
Days/studying week#	before Covid-19 *	6017	5.00(1.39)	-8.70	6016	<.001	.01
	during Covid-19	6017	5.22(1.74)				

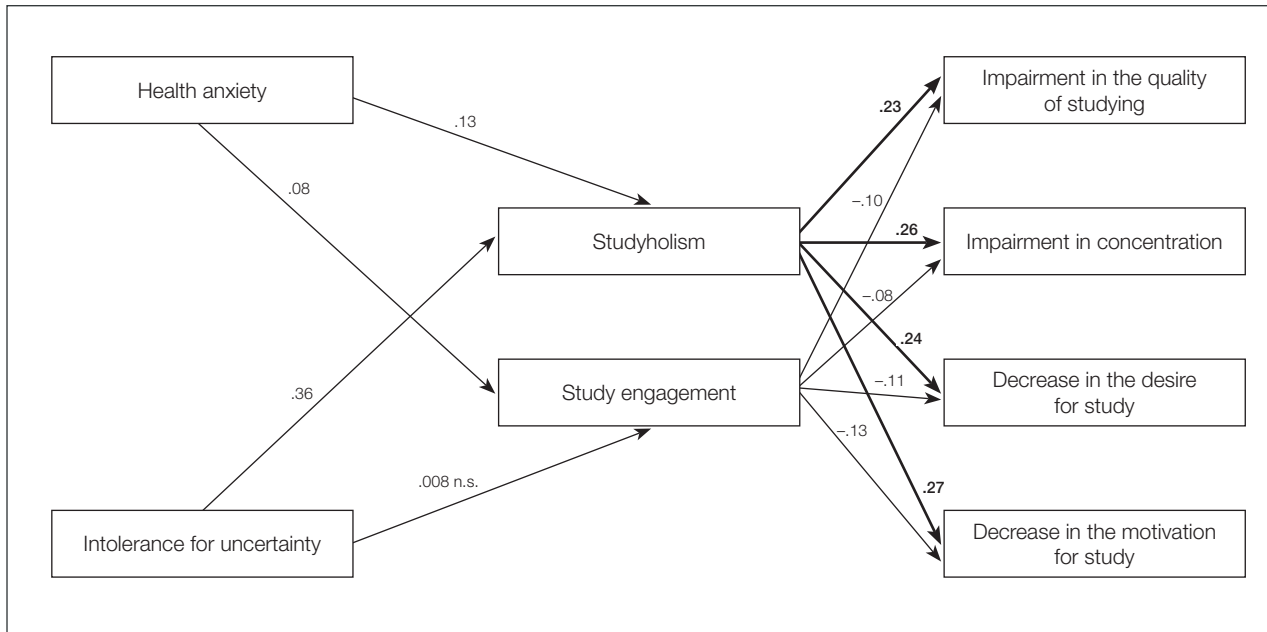
Legenda. *df* = degree of freedom; * = Hours of studying per day; # = Days of studying per week.

18.5% of the variance in studyholism is explained by its predictors (for study engagement, the variance explained is instead very low: .7%). The study-related variables are predicted at a good level, too; those are the percentages for their explained variance: decrease in study motivation, 8.1%; concentration impairment, 7%; decrease in the desire for studying, 6.4%; impairment in the quality of the study, 5.9%. More specifically, while studyholism predicts the impairment in studying (quality, concentration, desire for studying, motivation for studying), study engagement is a negative predictor of these variables. Figure 1 shows the standardized path values.

DISCUSSION

This study aimed to shed light on the impact that the Covid-19 outbreak had on college students' attitudes toward studying and their academic careers.

First, we found support for teachers' engagement in online activities: students reported that most of their teachers promptly used online lessons and have been available for clarifications upon request. Though, even if students recognized that teachers did their best to provide lessons, they reported just an average level of satisfaction with these lessons. Moreover, they experienced several downsides on

Figure 1 – Structural model with standardized path estimate (n = 6075)

Note. All the beta values have $p < .001$.

their academic career: many students decided not to take the exams they planned for April and May, even if they could have done them in the online format; the internships have been interrupted or even not started for some students; most of the students who planned to discuss their thesis by 2020 reported to expect a delay in their graduation.

Moreover, this study highlighted that, compared to normative values identified in previous studies conducted before the Covid-19 outbreak, students reported higher levels of studyholism (i.e., obsession toward study), lower intention to dropout, and no change in their study engagement levels during the lockdown. Regarding the time spent studying, they reported a higher number of hours of studying per day but a lower number of days per week. Though, the effect sizes are small. Hence, students experienced both positive and negative consequences on their studying attitudes during the lockdown. On the positive side, they increased their time spent studying daily but decreased the days per week of studying. This might suggest that they devoted more hours to study thanks to the lack of many other daily duties that could reduce their time available for study. However, it seems that

students also allowed themselves to have some days in which they did not study (and maybe did something relaxing/funny for themselves). Therefore, we speculate that during the lockdown, students optimized their management of time devoted to study. In line with this, their dropout intention decreased, probably also because of a decline in their stress and psychopathology symptoms, as previously found in our study on youths' psychological well-being during the lockdown (Loscalzo & Giannini, 2021a). Though, it should be specified that Loscalzo and Giannini (2021a)'s findings are not in contrast with previous studies highlighting high levels of distress in students (e.g., Ma et al., 2020; Romeo et al., 2021). In fact, that study did not show that Italian students did not experience psychological symptoms during the lockdown. Referring to the cut-off values of the self-report used for evaluating depression, anxiety, and stress, we found that (on average) Italian college students reported moderate symptoms of depression and stress and between mild and moderate symptoms of anxiety during the lockdown. However, compared to Italian students who filled the same instrument before the pandemic, they found (on average) an

ameliorating in their physical and psychological well-being, which we suggest might also explain the lower dropout intention we found in the current study.

Finally, it is interesting to note that study engagement levels did not change, suggesting that this positive attitude toward study is not affected by environmental stressors that could negatively influence the academic curriculum.

Though, on the negative side, studyholism increased during the lockdown. We speculate that obsessive thinking about studying has been fueled by the uncertainty concerning the format for exams and dissertations, as well as for the traineeships, which in turn could have increased the worries about the academic path and an expected delay in graduation. In fact, Loscalzo and Giannini (2019) and Loscalzo (2021) previously showed that worry is a strong predictor of studyholism. In line with this, our path analysis showed that the intolerance for uncertainty is a good predictor of studyholism. Health anxiety, which could have been increased during the Covid-19 outbreak due to the heightened attention to somatic symptoms, predicts it instead with a low beta value. Hence, in general, students characterized by a high intolerance for uncertainty might have experienced high distress during the lockdown since there has been great uncertainty concerning the health, economic, and academic situation. Therefore, they might have increased their obsessive thinking about studying due to the great uncertainty concerning their academic path.

The results about the predictive power of intolerance for uncertainty on studyholism also provide additional support to Loscalzo and Giannini's (e.g., 2017, 2018a, 2020b) conceptualization of problematic overstudying as an internalizing disorder, or as an obsessive-compulsive related disorder, since it is a feature of internalizing disorders, including OCD (e.g., Baldwin et al., 2017; McEvoy & Mahoney, 2012). In fact, the new potential clinical condition associated with problematic overstudying has been conceptualized by different authors as a condition more similar to an OCD-related disorder (i.e., an internalizing disorder; Loscalzo & Giannini, 2017, 2020b) or as a behavioral addiction (i.e., an externalizing disorder; Atroszko et al., 2015). Though, Loscalzo and Giannini (e.g., 2017, 2018a, 2018c) suggest going beyond the addiction framework to shed light on the internalizing and/or externalizing nature of problematic overstudying, since the literature about this topic is still too scant to reach any firm conclusion. Hence, they are analyzing studyholism correlates through some studies, aiming to

understand if it might actually be defined as an OCD-related disorder. Among their published studies, Loscalzo and Giannini (2019) and Loscalzo (2021) showed that worry (an internalizing feature contributing to OCD; Comer et al., 2004) is a very strong predictor of studyholism, providing support to their OCD-related disorder conceptualization. The current study provides additional evidence to Loscalzo and Giannini's conceptualization, as it highlights that tolerance for uncertainty, that is another psychological variable representing a feature of OCD (and other internalizing disorders; e.g., Baldwin et al., 2017; McEvoy & Mahoney, 2012), is a good predictor of Studyholism.

Finally, we found that studyholism predicts an impairment in the study's concentration and quality and a decrease in the desire and motivation for study during the lockdown, highlighting that it has been a risk factor for a higher impairment in study during the quarantine. Instead, study engagement played a protective factor since it is a negative predictor of these study-related variables. However, its beta values are low, suggesting that to prevent academic impairment in college students, we should primarily target studyholism, as it has a more substantial role. Therefore, in case of another lockdown, interventions addressed to college students should be implemented to increase their tolerance for uncertainty, allowing them to cope better with the academic uncertainty and maintain a fruitful study behavior. Moreover, considering the self-reported impairment in the study experienced by studyholics during the lockdown, it is critical to provide students – especially the ones with high studyholism – with interventions aimed at reducing their obsession with studying. These interventions should give them the possibility to forgive themselves for the delays they could have had in their academic path during the lockdown, to accept this delay, and hence move forward their graduation with higher study engagement and lower studyholism and, therefore, with a better physical and mental health (Loscalzo, 2021; Loscalzo & Giannini, 2019).

Among the main limitations of this study there is the female prevalence of the sample and a higher prevalence of students from Central Italy. About the higher female prevalence, we speculate that this might be because gender could affect the response rate to online surveys. In fact, Saleh and Bista (2017) suggested that male participants are more likely to respond to surveys if they received a reminder. We did not send a reminder; hence, we suggest that adopting such a strategy could help to increase the male response rate, for

future studies. Finally, we did not include other psychological variables, such as personality traits, that could have influenced the results of our analyses. However, among the merits, we have used a wide sample that is heterogeneous concerning the year and the study area. Moreover, we provided evidence for the negative impact of the Covid-19 outbreak on college students' academic path: some students did not take their exams, did not do their traineeships, and expected a delay in their graduation. Also, they have not been very satisfied with the online lessons. Also, this study highlighted that students characterized by high levels of intolerance for uncertainty experienced higher studyholism, which in turn lead to a decrease in concentration, in the quality of the study, and in the desire and motivation for studying. However, it should also be noted that, generally, study engagement levels have not been impacted by the pandemic, and that dropout intention decreased, probably because of a decline in the stress and psychopathology they experienced (Loscalzo & Giannini, 2021a) and because of better time management for studying. Finally, it provided further support to the definition of problematic overstudying as an OCD-related disorder instead of a behavioral addiction (Loscalzo, 2021; Loscalzo & Giannini, 2017, 2018a, 2018b, 2019, 2020a, 2020b).

In conclusion, we urge universities to promptly provide students with psychological interventions to reduce their studyholism levels to facilitate a better recovery of the academic path despite some delays they might have experienced. They should also increase their tolerance for uncertainty to increase their resilience in the case of another pandemic (or a new wave of Covid-19). These interventions, considering the ongoing health emergency, might be implemented online. Moreover, we suggest that a group counseling session would be more appropriate than individual counseling, as it might help students feel that they are not alone in experiencing psychological symptoms due to the pandemic, a negative impact on their academic path, or high levels of studyholism and intolerance for uncertainty. An intervention grounded on the self-help group format, with a psychologist as moderator, might be

effective in allowing students to discuss their difficulties and collaboratively find solutions. Also, more resilient students might provide a model for those students who faced more significant adverse consequences and provide them with some solutions they used to cope well with the pandemic and its impact on their study. About targeting more specifically studyholism and intolerance for uncertainty, we suggest organizing counseling group sessions in which students fill the SI-10 and the IUS-R, that is, the instruments for evaluating studyholism, study engagement, and intolerance for uncertainty. Next, their scores might be used to prompt a discussion about their attitudes towards study and tolerance for uncertainty and help them acquire self-knowledge about these characteristics. Then, soft skill training would help reduce studyholism and intolerance for uncertainty and increasing study engagement. For example, the training might increase assertiveness, time management skills, and effective stress coping strategies.

Finally, since students recognized the teachers' effort in providing lessons, but they did not report high satisfaction with these lessons, we strongly recommend universities to work on the maximization of the quality for online lessons to be provided in case of other crisis requiring lockdown, but also as an additional option that could be given to students who also work and cannot attend "regular" lessons. For example, it would be helpful to organize focus groups aimed at discussing those aspects that the students found positive (and negative) in the online lessons, aiming to elicit ideas for the implementation of changes in the organization of the university lessons which might next be reported to the rector for his/her consideration and application. For example, if the students found it useful to have available recorded lessons to watch on-demand, it might be suggested to record lessons when all the courses will be held again at university. Also, if the students found that online lessons were not useful to increase their competencies, it might be suggested to organize some courses that might teach teachers to settle lessons that are more effective in spreading knowledge and competencies.

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