
Psychological Impact of Covid-19 Epidemiological Measures on Czech University Students and Potential Protective and Risk Personality Factors in Educational Setting

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ABSTRACT

Background: During the Covid-19 pandemic the educational system was hit by an unprecedented task with both, universities and students facing many challenges, both in study and life. The aim of this study was to assess psychological impact of Covid-19 epidemiological measures on Czech university students, and to examine the effect of personality traits on the perception of current situation. Methods: The sample consisted of 438 university students of Palacky University in Olomouc. Data were collected using questionnaires assessing psychological impact, personality characteristics, and attitudes and perception of current Covid-19 situation. Data were analysed using hierarchical multiple linear regressions. Results: The results showed that negative perception of Covid-19 situation increases depression, anxiety, stress, concerns about finishing the semester increase depression, anxiety, stress, concerns about own health increase depression, anxiety, concerns about family health increase anxiety, external locus of control increases depression, internal locus of control increases stress, resilience increases depression, anxiety, stress, emotional regulation scale strategies increase depression, anxiety, stress. Conclusion: The results suggest that systematic building of students' resilience and clear, supportive communication of university with students might be effective strategies to prevent the negative impact of Covid-19 (or similar) pandemic on students' mental state and well-being in educational setting.

Keywords

Covid-19; psychological impact; university students; risk factors

Introduction

The Covid-19 pandemic has created a great challenge in many areas of life and to various people, groups of professionals, as well as organizations and counties. The educational system has been affected by an unprecedented situation in the form of the complete closure of all schools (Usnesení Vlády České Republiky č. 74/2020 Sb., o Přijetí Krizového Opatření, 2020) ordered by the government, which has created

unexpected and immediate challenges and uncertainties for students and the schools themselves. The need for an immediate transfer to the online environment, uncertainty about the further course of study in the current semester, organization of exams, state examinations, interruption of research, preparation of qualification theses, etc.; these were all questions and tasks that everyone had to deal with (Krishnamurthy, 2020; Nguyen, Pham, & Nguyen, 2020; Rajhans, Memon, Patil, & Goyal, 2020).

This disruption of the normal and expected course of study might have added up to the overall negative impact of the global Covid-19 pandemic on the mental health of students and teachers (Huremović, 2019). The educational system should take care of students' mental state and well-being, not only because developing and supporting the student's personality is one of its educational goals, but also because the impaired mental state negatively affects students' learning performance and creates a long-term unsustainable threat to the educational process.

Given the novelty of this issue, only few studies have so far described the psychological impact of the Covid-19 pandemic, both on the general public and health professionals (Chen, Zhou, Zhou, & Zhou, 2020; Pfefferbaum & North, 2020; Rossi et al., 2020; Wang et al., 2020) and specifically on students (Cao et al., 2020; Grubic, Badovinac, & Johri, 2020; YoungMinds, 2020). Furthermore, most of these studies were conducted in environments heavily affected by the Covid-19 pandemic such as China or Italy. The data on the impact of the Covid-19 pandemic and government-imposed measures in the university environment of a country that has not been directly affected by an excessive number of Covid-19 infections but is influenced by the influx of negative information from abroad and by a general concern about possible risks, is still lacking. To fill this gap, the aim of this study is to provide an insight into the prevalence of psychological distress in university students, as well as to identify possible protective and risk personality characteristics associated with an increase in this distress.

Methodology

The study was conducted from April 8 to April 30 2020. During this period the Czech Republic implemented strict public health measures in response to Covid-19, including the national quarantine and the closure of schools, shops (except for daily essentials), restaurants and borders, social distancing, and obligatory personal protection equipment. A total of 1,053 university students of the Faculty of Education, Palacký University Olomouc, Czech Republic, were invited to join the study. 438 (41.6%) students

responded and completed the online survey. All participants signed an informed consent.

The data were collected using a Google Forms online survey consisting of several parts. The first part contained demographic questions, items regarding the Covid-19 pandemic and government measures on life and study (measured on a 5-point Likert-type scale ranging the magnitude of the negative effect), related concerns about one's own and family members' health and about finishing the semester (measured on a 5-point Likert-type scale ranging from "totally disagree" to "total agree"), and the perceptions concerning the university's approach and communication (measured on a 5-point Likert-type scale ranging from "totally disagree" to "totally agree" and by means of dichotomic yes/no items).

The second part consisted of a battery of 6 psychological tools. The Patient Health Questionnaire (PHQ-4) (Löwe et al., 2010) is short 4-item tool with a 4-point Likert-type scale measuring the severity of depressive symptoms and anxiety (scoring 0-12 for total discomfort and 0-6 for depressive symptoms and anxiety). The Perceived Stress Scale (PSS-4) (Cohen & Williamson, 1988) is a short 4-item uni-dimensional tool with a 5-point Likert-type scale measuring stress levels (scoring 0-16). The Prosocial Behavioral Intentions Scale (PBIS) (Baumsteiger & Siegel, 2019) is a 4-item uni-dimensional tool with a 7-point Likert-type scale measuring the levels of intention to behave prosocially (scoring 4-28). The Internal External Locus of Control-4 scale (IE-4) (Kovaleva, 2012) is a 4-item uni-dimensional tool with a 5-point Likert-type scale measuring the presence of internal and external locus of control (scoring 1-5). The Connor-Davidson Brief Resilience Scale (CD-RISC) (Vaishnavi, Connor, & Davidson, 2007) is a 2-item uni-dimensional tool with a 5-point Likert-type scale measuring resilience (scoring 0-8). The Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004) is a 18-item tool with a 5-point Likert-type scale measuring the presence of the seven types of emotion-related difficulties (subscale scoring 3-15, total scale scoring 18-90). Four indicators of Covid-19 impact on psychological well-being were used: total psychological distress (as measured by all items

of PHQ-4), severity of depressive symptoms and anxiety level (as subscales of PHQ-4), and stress level (as measured by PSS-4).

Results

The study sample consisted of 438 university students, 30 males and 408 females, with mean age of 23.8 ± 7.0 years (mean \pm SD). Most of the participants were in non-graduate year and studied in the full-time form of study (Table 1). Due to the significant imbalance in the proportion of both genders, the effect of gender was not analysed.

Regarding the prevalence of the individual aspects of psychological distress, the results showed that the levels of depression and anxiety were around 40%, and increased stress levels were present in

68.5% of the participants, with 20% demonstrating a severe stress level (Table 2). These results were similar for both genders.

A series of hierarchical multiple regression analyses were performed to assess the effect of selected personality characteristics and Covid-19 associated perceptions on the individual indicators of Covid-19 impact on psychological distress (Table 3). In the first step the effect of Covid-19 associated perceptions and concerns was analysed. The independent variables accounted for 36% (psychological discomfort), 38% (severity of depressive symptoms), 25% (anxiety), and 33% (stress) of the explained variance, with the negative perception of the Covid-19 situation and concerns about finishing the semester showing the greatest impact.

Table 1. Basic characteristics of research sample

		Total (N = 438)	Male (N = 30)	Female (N = 408)
Age		23.8 \pm 7.0 ^a	30.5 \pm 11 ^a	23.3 \pm 6.4 ^a
Study year	graduate year	45 (10.3) ^b	9 (30) ^b	36 (8.8) ^b
	non-graduate year	393 (89.7) ^b	21 (70) ^b	372 (91.2) ^b
Form of study	full-time	354 (80.8) ^b	15 (50) ^b	339 (83.1) ^b
	distance	84 (19.2) ^b	15 (50) ^b	69 (16.9) ^b

^amean \pm SD, ^bcount (%)

Table 2. Distribution of individual indicators of psychological distress for total sample and both sexes (count (%)).

	Psychological discomfort (PHQ-4)	Depressive symptoms (PHQ-4)	Anxiety (PHQ-4)	Moderate-severe stress (PSS)	Severe stress (PSS)
Total	52 (35.6)	38 (38.4)	43 (43.8)	100 (68.5)	29 (19.9)
Sex					
males	4 (40.0)	4 (40.0)	4 (40.0)	5 (50.0)	2.0 (20.0)
females	48 (35.3)	52 (38.2)	60 (44.1)	95 (69.9)	27 (19.9)

In the second step, personality characteristics were included into the regression models. The results showed (Table 3 and Figure 1) that these independent variables accounted for additional 15% (psychological discomfort, adding up to the

total of 50%), 17% (severity of depressive symptoms, adding up to the total of 50%), 15% (anxiety, adding up to the total of 38%), and 21% (stress, adding up to the total of 53%) of the explained variance.

Table 3. Hierarchical multiple regression analyses of predictors of Covid-19 impact on psychological distress (N = 438)

Predictor variables	Psychological discomfort		Depression		Anxiety		Stress	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Covid-19 associated perceptions and concerns								
Concerns about own health	0.07	-0.01	0.15**	0.09*	-0.03	-0.11*	0.02	-0.07
Concerns about family health	0.04	0.05	0.01	0.00	0.06	0.10*	0.00	0.06
Concerns about finishing the semester	0.17**	0.13**	0.12**	0.09*	0.20**	0.16**	0.24**	0.16**
Age	-0.03	0.05	0.07	0.13**	-0.13**	-0.06	-0.04	0.03
Negative perception of Covid-19 situation	0.47**	0.39**	0.49**	0.42**	0.36**	0.30**	0.43**	0.36**
Personality characteristics								
Prosocial behaviour		-0.04		0.02		-0.09*		-0.01
Internal locus of control		0.01		0.04		-0.03		-0.15**
External locus of control		0.08*		0.09*		0.06		0.08
Resilience		-0.17***		-0.16**		-0.15**		-0.19**
Emotional Regulation: Awareness		-0.12**		-0.04		-0.18**		-0.01
Emotional Regulation: Clarity		-0.01		-0.04		0.03		0.05
Emotional Regulation: Goals		0.01		0.05		-0.03		0.19**
Emotional Regulation: Impulse		0.09		0.08		0.08		0.04
Emotional Regulation: Nonacceptance		-0.07		-0.03		-0.11*		-0.10*
Emotional Regulation: Strategies		0.23**		0.18**		0.24**		0.17**
F	49.49**	29.89**	54.56**	29.62**	29.34**	18.63**	43.63**	33.55**
R	0.60	0.72	0.62	0.72	0.50	0.63	0.58	0.74
R ²	0.36	0.52	0.39	0.51	0.25	0.40	0.34	0.54
Adj. R ²	0.36	0.50	0.38	0.50	0.25	0.38	0.33	0.53
ΔR ²		0.15		0.17		0.15		0.21

* P<0.05, ** p<0.01.

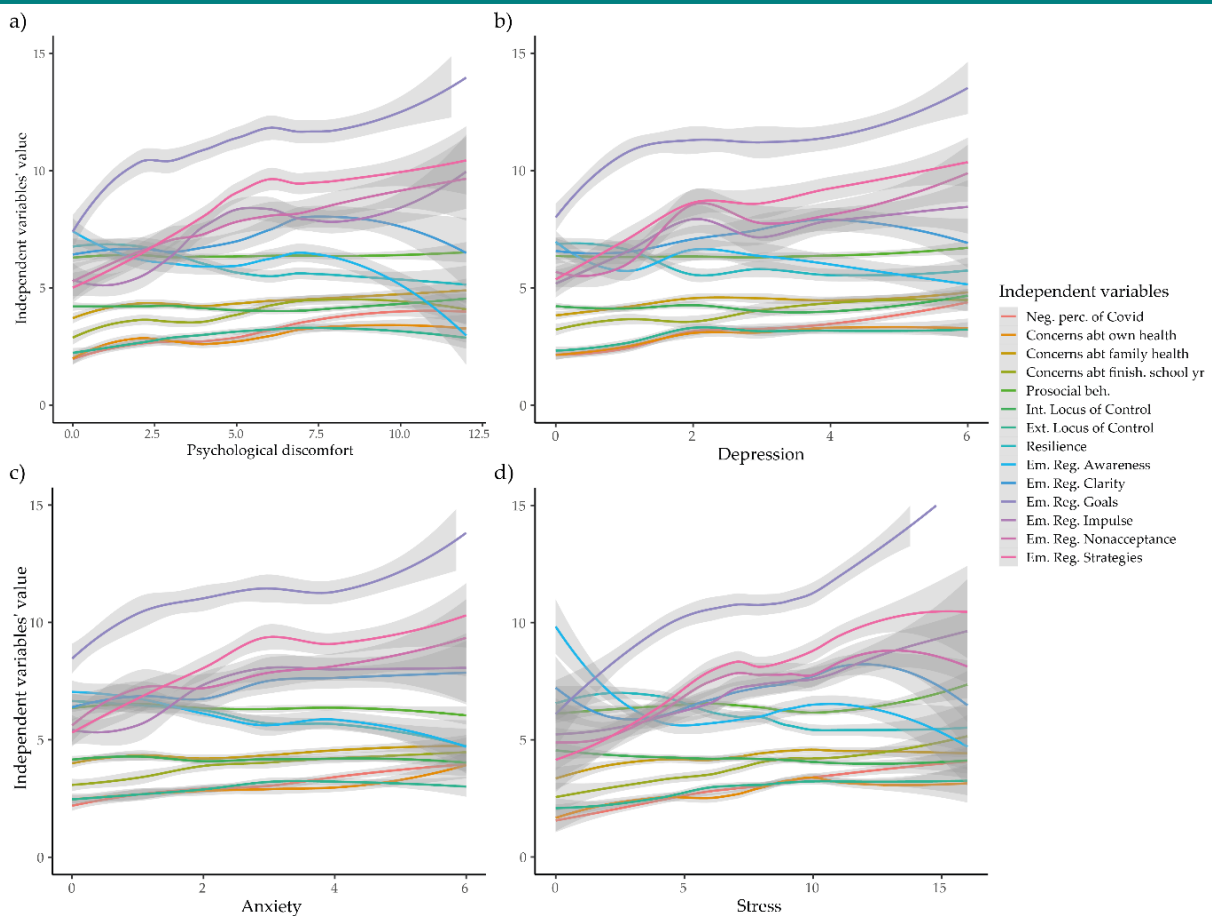


Figure 1. Effect of personality traits on psychological well-being. (a) Regression lines using Loess nonparametric method, showing the effect of independent variables on the total psychological discomfort; (b) Regression lines using Loess nonparametric method showing the effect of independent variables on the severity of depressive symptoms; (c) Regression lines using Loess nonparametric method showing the effect of independent variables on anxiety level; (d) Regression lines using Loess nonparametric method showing the effect of independent variables on stress level.

This increase represents a further significant contribution of personality characteristics to the negative psychological effect of Covid-19-related actions on psychological distress and well-being of students. Resilience and limited access to emotion regulation strategies have been shown to have a significant effect on all indicators of psychological distress. External locus of control showed a specific effect on psychological discomfort and severity of depressive symptoms, lack of emotional awareness showed an effect on psychological discomfort and anxiety, non-acceptance of emotional responses showed an effect on anxiety and stress, and internal locus of control with difficulty in engaging in goal-directed behaviour showed an effect on stress. Based on the directions of beta coefficients, the

results suggest that resilience, internal locus of control, with lack of emotional awareness and non-acceptance of emotional responses act as protective factors (with a higher score the negative effect of Covid-19 is lower), while external locus of control with a limited access to emotion regulation strategies and difficulty in engaging in goal-directed behaviour act as risk factors (with a higher score the negative effect of Covid-19 is greater).

Discussion

The main goal of this study was to measure the impact of Covid-19 pandemic and related government-imposed measures on university students. Our results provided an important insight

into the issue of the impact of Covid-19 on students within a country that has been influenced rather by the concern about possible risks than by an excessive presence of infections. The results showed that the prevalence of depressive symptoms and anxiety was about 40%, while the prevalence of stress was 68.5% for moderate-to-severe stress, and 20% for severe stress. These prevalence values are quite high and correspond with the similar previous studies (Liu, Zhang, Wong, Hyun, & Hahm, 2020; Maia & Dias, 2020; Odriozola-González, Planchuelo-Gómez, Irurtia, & de Luis-García, 2020; Tang, Hu, Hu, et al., 2020; Tang, Hu, Yang, & Xu, 2020) as well as the findings concerning first line high-risk populations such as healthcare professionals (Abdessater et al., 2020; Chen et al., 2020; Elbay, Kurtulmuş, Arpacioğlu, & Karadere, 2020; Lu, Wang, Lin, & Li, 2020). They are also startlingly high if we take into account that the negative psychological response usually decreases during the course of the outbreak (Blendon, Benson, DesRoches, Raleigh, & Taylor-Clark, 2004; F. Lau, Tsui, Kim, Chan, & Griffiths, 2010) and that the data were collected several weeks after the beginning of the school closure and other restrictive epidemiological measures by which time students already had enough time to accommodate. The results indicated that the overall negative perception of the Covid-19 pandemic (which covers various aspects of this situation) had the greatest impact on students' psychological distress. Study-specific concerns about finishing of the semester were the second most influential factor showing that students' lives and mental state revolved mainly around their study.

The study also identified possible protective and risk personality characteristics associated with the increase of individual types of psychological distress. In general, resilience and limited access to emotion regulation strategies have shown to have the greatest impact on all the psychological distress variables. Both types of locus of control and several emotion regulation variables then affect some of the selected psychological distress variables. The protective effect of resilience on effective management of a traumatic situation is well known (Friedberg & Malefakis, 2018; Vinkers et al., 2020). Similarly, the negative effect

of difficulties in regulation of emotions has already been described in several studies (Bardeen, Kumpula, & Orcutt, 2013; Jiang, Nan, Lv, & Yang, 2020; Restubog, Ocampo, & Wang, 2020). As the results showed, although the influence of different types of emotional regulation problems has been shown, one particular category, namely limited access to emotion regulation strategies, exhibited its effect in all areas of psychological distress. It seems that to know how to deal with one's emotions is the most important thing to effectively manage emergency and traumatic situations such as the Covid-19 pandemic.

Limitations and Future Studies

The study has a few limitations. The size of the sample is acceptable, however, the proportion of both genders is rather imbalanced (although quite well representing the gender structure of students at the Faculty of Education). Furthermore, the research sample is limited to university students of a single faculty. A more diverse sample, including students from different faculties and disciplines could provide a more generalized data on this issue. Finally, the cross-sectional nature of the study did not allow to directly assess the changes in the levels of psychological distress or changes in time. A longitudinal design with multiple time-points might also provide a better insight into the mechanisms of Covid-19 effects on university students.

Further research should focus on other factors affecting psychological well-being and distress of university students to better understand the mechanisms underlying students' coping with these exceptional circumstances. However, the findings emphasise the need for intensified efforts to provide psychological help and support. Culturally appropriate prevention and intervention tools (maintained by university counselling departments) need to be designed or improved, including a distant approach (i.e. web-based tools) and effective methods to quickly assess the presence of psychological distress or increased risk factors (Renton et al., 2014). These efforts are particularly necessary given that many students are reluctant to admit their psychological difficulties for fear of

stigmatization (Ahmedani, 2011; Parcesepe & Cabassa, 2013), and that untreated long-term depression and stress might have a negative impact in many areas (mental as well as physical) (Belleau, Treadway, & Pizzagalli, 2019; Houtjes et al., 2014). Also, better preparedness of universities for possible recurrence of disruptions and the need to move to an online environment is necessary (Krishnamurthy, 2020; Rajhans et al., 2020; Vlădescu, 2017). That also includes the need for change in the role and approach of teachers - from a transmitter of information to a facilitator of learning through new tools (online and distant) (Vlădescu, 2016). Above all, the comprehensibility and timeliness of communication need to be improved.

Conclusion

The results suggest that systematic building of students' resilience and their ability to manage and control their own emotions, together with clear and supportive communication between the university and its students might be effective strategies to prevent the negative impact of the Covid-19 (or similar) pandemic on students' mental state and well-being. This mental state represents an important basis for effective functioning and achieving of desired educational goals, and impaired mental state of students creates a long-term unsustainable threat to the educational process itself.

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