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# Covid-19 Related Stress During the Pandemic Among University Students

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**Keywords**

COVID-19; pandemics; stress; students

**Abstract**

**Aim:** Certain groups in society, such as students, were exposed to higher levels of stress during the COVID-19 pandemic and thus fell into vulnerable groups when it comes to mental health. This research aimed to investigate the presence and expression of stress symptoms related to the COVID-19 pandemic in university students and to what extent stress had an impact on a broad aspect of the everyday life of students. **Subjects and methods:** This observational cross-sectional study included data collected from January 2021 to May 2021 at the Catholic University of Croatia. Given that the research was conducted during the COVID-19 pandemic, the respondents (223) participated via an online survey in accordance with the social distancing guidelines that were implemented in the Republic of Croatia during that time period. For research purposes we used the COVID Stress Scales (CSS) instrument. **Results:** The results showed that with the respondents of this study, the feeling of danger was the most pronounced, followed by the fear of contamination. The highest possible score for any measured symptom is 24, and none of the symptoms had a mean higher than 11 so it can be said that the symptoms were not expressed to a large extent. **Conclusion:** Although the symptoms of stress were not significantly expressed in this study, it is necessary to provide adequate consideration to all risk groups and provide help in protecting mental health to all who need it, especially in crises such as a pandemic.



## Introduction

At the end of December 2019, the novel coronavirus pneumonia began to spread in Wuhan, China. The World Health Organization (WHO) officially named this disease coronavirus disease 2019 (COVID-19) on February 11, 2020. Since the outbreak, COVID-19 has brought major harm and challenges to more than 200 countries and regions around the world [1]. In addition to the impact on physical health, COVID-19 also affected people's psychological health. The level and expression of stress symptoms were different at their peak during the pandemic in different groups of people, including students. Some of the reasons why students were one of the groups most affected by stress during the COVID-19 pandemic were the uncertainty regarding academic success, future career, and social life

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while studying. Economic impact, social isolation, and reduced access to medical care and community support are significant risk factors leading to a variety of psychological problems. The disease has seriously disrupted education at all levels and, consequently, the lives of students of all age groups [2-10]. During the COVID-19 pandemic, universities had to change the organisation of classes in order to avoid the spread of the virus among students. Therefore, the teaching has been switched to online lectures. Campus closures, an unplanned rapid transition to online learning, the introduction of social distancing, wearing masks and travel restrictions to curb the transmission of the virus were just some of the stressful factors for the student population and other groups of people [2,5,7,9,11-12]. In addition to the effect on psychological stress, COVID-19 also affected the physical health of students. An in-depth multidisciplinary investigation mapping the transmission pattern of COVID-19 in a group of US college students during the 2020 Spring Break concluded that 21.9 % of infected individuals were asymptomatic and the rest suffered from the already established mild known symptoms of COVID-19 such as headaches, anosmia, sore throat, coughing, shortness of breath, diarrhoea, fatigue, and less commonly, fever. It is important to note that physical illnesses such as seasonal respiratory infections are associated with poor learning outcomes, and common symptoms of mild cases of SARS-CoV-2 infection are likely to be detrimental to learning [13]. Although hospitalisations and deaths remained rare among the main 18- to 24-year-old student age group, infection control measures meant that many had to self-isolate, alone, in their bedrooms, sometimes with limited or unreliable access to food, and caused widespread concern for their well-being [12-13]. On the other hand, with the introduction of home quarantine, the majority of students had to isolate themselves from their families. For many students, family is a significant source of psychological support and a positive link to their mental health. However, this is not always a positive relationship. One study showed that for some students, their own family has a negative influence on their mental health. With the introduction of long-term home quarantine, most students and their families had to study or work at home while living together in a confined space. This scenario potentially leads to an increase in the probability of family conflict, and thus to an increase in the level of individual anxiety. Furthermore, many students rely on their own work to finance their living expenses. Working in the service sector is the most common choice for students. Unfortunately, the mentioned sector was the most affected by the measures of social isolation, and therefore a large part of the students was left without a source of income. Many employees in cafes, restaurants and shops have lost their jobs. Extensive analyses from a large study in the United States conducted during April 2020 revealed a clear correlation between the financial shocks of COVID-19 and negative impacts on the academic progress of the poor [13,14]. Younger adults are at the lowest risk of getting sick and developing more severe symptoms and forms of the disease from COVID-19. However, they represent the riskiest group when it comes to the deterioration of mental health [15-17]. For this reason, this paper aims to show the presence and expression of stress symptoms related to the COVID-19 pandemic in students of the Catholic University of Croatia (CUC).

## Subjects and Methods

This research was an observational cross-sectional study conducted from January to May 2021. Given that the research was conducted during the COVID-19 pandemic, the respondents participated by solving an online survey in accordance with the social distancing guidelines that were implemented in the Republic of Croatia during that time period. The planned number of respondents was 200. In the end, 223 respondents participated in the research, of which 87 nursing students, 59 psychology students, 28 sociology students, 37 communication studies students and 12 history students. For research purposes, we used the COVID Stress Scales (CSS). The CSS is a self-report measure designed to assess the risk of contamination related to COVID-19, fear of socio-economic consequences, xenophobia, safety-seeking, and traumatic stress symptoms. Each item is rated on a five-point Likert scale from 0 to 4. The questionnaire was originally developed in English. This questionnaire was translated into Croatian. The items on the scale were translated into Croatian, back-translated into English, and then compared with the original English version. The back-translation was evaluated by a group of individuals unaffiliated with the study, who noted no inconsistencies between the translated and original English versions. After these processes, students were given the final Croatian version of the questionnaire. The CSS has 36 items derived through exploratory and confirmatory factor analyses to examine stress related to COVID-19 across six factors, including danger (6 items), contamination (6 items), fear of socio-economic consequences (6 items), xenophobia (6 items), seeking help and safety (6 items), and traumatic stress (6 items). In 2020, Taylor and associates confirmed the reliability and validity of the CSS on Canadian and American samples (18). We obtained written permission from the same author to use this instrument in this setting and research. The questionnaire was written using Google Forms, and the respondents received it through their official e-mail contacts. The questionnaire was applied for almost 5 months from January 27 to May 12, 2021, while the majority of answers (148) were received in the period from January 27 to 29, 2021. From May 7 to 12, 71 responses were received. All subjects confirmed that they were over 18 years of age and gave their consent for inclusion before participating in the study. Participation in this research was anonymous.

**Table 1.** Sociodemographic characteristics and type of studies

| | N | % |
|---|---|---|
| Sex | | |
| Male | 33 | 14.8 |
| Female | 190 | 85.2 |
| Total | 223 | 100 |
| Level of education | | |
| Undergraduate degree | 127 | 57.0 |
| Graduate degree | 96 | 43.0 |
| Total | 223 | 100 |
| Studies | | |
| Psychology | 59 | 26.5 |
| Nursing | 87 | 39.0 |
| Sociology | 28 | 12.6 |
| Communication Science | 37 | 16.6 |
| History | 12 | 5.4 |
| Total | 223 | 100 |

## Results

The research included 223 respondents, of which 33 (14.8 %) were male and 190 (85.2 %) were female. We divided the respondents according to the studies they attended. The largest number of respondents were studying nursing 87 (39 %), followed by psychology 59 (26.3 %), communication 37 (16.6 %), sociology 28 (12.6 %), and 12 of them (5.4 %) were at the end of history studies (table 1).

Table 2 shows descriptive parameters of stress symptoms related to COVID-19.

Among respondents in this research, the feeling of danger was most pronounced (M = 10.04), followed by fear of contamination (M = 6.57). It is followed by seeking help (M = 5.11), xenophobia (M = 4.68), socio-economic consequences (M = 3.66), and traumatic stress (M = 2.48), (table 2). The highest possible score for any of the symptoms is 24, and none of the symptoms has an arithmetic mean greater than 11.

To test the differences in the expression of symptoms among students of nursing and other studies, descriptive parameters were first presented concerning the group to which they belong, and then the differences were calculated and presented using a table.

In both groups of subjects (nursing students and students of other studies), not a single symptom has moved towards higher values, the danger of symptoms being the most pronounced. All symptoms related to COVID-19 are slightly more pronounced in nursing students, except for traumatic shock, which is slightly more pronounced in students of other studies. However, to test the differences in the expression of symptoms, t-tests were used to test the differences.

There were no statistically significant differences between nursing students and students of other studies in the expression of symptoms related to COVID-19 ($p < 0.05$).

Analysis of Variance was used to determine the differences between individual Study Departments in the expression of symptoms related to COVID-19.

There were no statistically significant differences between students of different studies in the differences in the expression of symptoms related to COVID-19 ($p < 0.05$).

To test the differences in the expression of symptoms between undergraduate and graduate students, descriptive parameters were first presented concerning the group to which they belong, and then the differences were calculated and presented using a table (table 7).

In both groups of subjects (nursing students and students of other studies), not a single symptom has moved towards higher values, the symptom of danger being the most pronounced.

Danger, socio-economic consequences, and traumatic stress are slightly more pronounced in undergraduate

**Table 2.** COVID Stress Scales domains according to COVID-19

| | Feeling of danger | Socioeconomic consequences | Xenophobia | Traumatic stress | Contamination | Seeking help |
|---|---|---|---|---|---|---|
| M | 10.04 | 3.66 | 4.68 | 2.48 | 6.57 | 5.11 |
| SD | 5.250 | 4.315 | 4.808 | 3.925 | 4.955 | 3.838 |
| Min. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Max. | 22.00 | 18.00 | 24.00 | 24.00 | 24.00 | 17.00 |

M – arithmetic mean, SD – standard deviation, Min. – minimum value, Max. – maximum value

**Table 3.** COVID Stress Scales domains according to COVID-19 with regard to study programme

| Study | | Feeling of danger | Socioeconomic consequences | Xenophobia | Traumatic stress | Contamination | Seeking help |
|---|---|---|---|---|---|---|---|
| Nursing | M | 10.34 | 3.64 | 5.22 | 2.10 | 6.60 | 5.41 |
| | SD | 5.426 | 4.577 | 5.467 | 3.822 | 5.188 | 4.277 |
| | Min. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Max. | 22.00 | 18.00 | 24.00 | 24.00 | 24.00 | 16.00 |
| Other studies | M | 9.84 | 3.66 | 4.34 | 2.71 | 6.56 | 4.92 |
| | SD | 5.146 | 4.156 | 4.321 | 3.985 | 4.819 | 3.532 |
| | Min. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Max. | 21.00 | 18.00 | 19.00 | 20.00 | 24.00 | 17.00 |

M – arithmetic mean, SD – standard deviation, Min. – minimum value, Max. – maximum value

**Table 4.** COVID Stress Scales domains according to COVID-19 with regard to study programme

| Study | | Feeling of danger | Socioeconomic consequences | Xenophobia | Contamination | Seeking help | Traumatic stress |
|---|---|---|---|---|---|---|---|
| Psychology | M | 1.5395 | 0.5960 | 0.6582 | 1.0141 | 0.7345 | 0.3729 |
| | SD | 0.84777 | 0.58247 | 0.70942 | 0.82773 | 0.50960 | 0.46665 |
| | Min. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Max. | 3.50 | 2.00 | 3.17 | 4.00 | 2.00 | 2.33 |
| Nursing | M | 1.7241 | 0.6073 | 0.8697 | 1.0996 | 0.9023 | 0.3506 |
| | SD | 0.90428 | 0.76291 | 0.91125 | 0.86470 | 0.71282 | 0.63695 |
| | Min. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Max. | 3.67 | 3.00 | 4.00 | 4.00 | 2.67 | 4.00 |
| Sociology | M | 1.7619 | 0.5417 | 0.8750 | 1.1250 | 0.9464 | 0.4048 |
| | SD | 0.87539 | 0.80460 | 0.74897 | 0.83718 | 0.66055 | 0.82081 |
| | Min. | 0.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Max. | 3.33 | 2.83 | 2.50 | 3.33 | 2.83 | 3.33 |
| Communication science | M | 1.7432 | 0.6396 | 0.7477 | 1.1802 | 0.8198 | 0.5090 |
| | SD | 0.83573 | 0.64730 | 0.73558 | 0.73638 | 0.66246 | 0.69826 |
| | Min. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Max. | 3.33 | 1.83 | 2.83 | 2.67 | 2.67 | 3.17 |
| History | M | 1.5278 | 0.7500 | 0.6111 | 1.1389 | 0.9444 | 0.7778 |
| | SD | 0.96356 | 1.05049 | 0.68288 | 0.86408 | 0.52864 | 0.92205 |
| | Min. | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Max. | 2.83 | 3.00 | 1.83 | 2.50 | 2.00 | 2.83 |

M – arithmetic mean, SD – standard deviation, Min. – minimum value, Max. – maximum value

**Table 5.** Distinction between nursing students and students of other studies in differences in the expression of symptoms related to COVID-19

| | F | Sig. | t | df | p |
|---|---|---|---|---|---|
| Feeling of danger | 0.658 | 0.418 | 0.702 | 221 | 0.483 |
| Socioeconomic consequences | 0.246 | 0.620 | -0.030 | 221 | 0.976 |
| Xenophobia | 3.435 | 0.065 | 1.336 | 221 | 0.183 |
| Traumatic stress | 0.616 | 0.434 | -1.132 | 221 | 0.259 |
| Contamination | 0.834 | 0.362 | 0.057 | 221 | 0.955 |
| Seeking help | 3.455 | 0.064 | 0.939 | 221 | 0.349 |

F – difference value, Sig. – test significance, t – t test value, df – degrees of freedom, p – significance level

**Table 6.** Distinction between students with respect to the study in differences in the expression of symptoms related to COVID-19

| | SS | df | MS | F | Sig. |
|---|---|---|---|---|---|
| Feeling of danger | 1.935 | 4 | 0.484 | 0.628 | 0.643 |
| Socioeconomic consequences | 0.410 | 4 | 0.103 | 0.195 | 0.941 |
| Xenophobia | 2.209 | 4 | 0.552 | 0.858 | 0.490 |
| Contamination | 0.704 | 4 | 0.176 | 0.255 | 0.907 |
| Seeking help | 1.426 | 4 | 0.356 | 0.869 | 0.483 |
| Traumatic stress | 2.374 | 4 | 0.593 | 1.397 | 0.236 |

SS – sum of squares, df – degrees of freedom, MS – arithmetic mean of the sum of squares, F – difference value, Sig. – significance of the test

**Table 7.** Descriptive parameters of stress symptoms related to COVID-19 according to study level

| Level of study | | Feeling of danger | Socioeconomic consequences | Xenophobia | Traumatic stress | Contamination | Seeking help |
|---|---|---|---|---|---|---|---|
| Undergraduate studies | M | 10.05 | 3.91 | 4.39 | 2.57 | 6.53 | 4.96 |
| | SD | 5.389 | 4.267 | 4.549 | 3.706 | 5.156 | 3.544 |
| | Min. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Max. | 21.00 | 18.00 | 19.00 | 20.00 | 24.00 | 17.00 |
| Graduated studies | M | 10.01 | 3.31 | 5.06 | 2.34 | 6.64 | 5.31 |
| | SD | 5.090 | 4.378 | 5.129 | 4.212 | 4.702 | 4.206 |
| | Min. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Max. | 22.00 | 18.00 | 24.00 | 24.00 | 24.00 | 16.00 |

M – arithmetic mean, SD – standard deviation, Min. – minimum value, Max. – maximum value

**Table 8.** Differences between undergraduate and graduate students in the expression of symptoms related to COVID-19

| | F | Sig. | t | df | p |
|---|---|---|---|---|---|
| Feeling of danger | 0.737 | 0.392 | 0.063 | 221 | 0.950 |
| Socioeconomic consequences | 0.007 | 0.935 | 1.030 | 221 | 0.304 |
| Xenophobia | 0.971 | 0.326 | -1.029 | 221 | 0.305 |
| Traumatic stress | 0.692 | 0.406 | 0.435 | 221 | 0.664 |
| Contamination | 1.761 | 0.186 | -0.161 | 221 | 0.873 |
| Seeking help | 1.343 | 0.248 | -0.677 | 221 | 0.499 |

F – difference value, Sig. – test significance, t – t test value, df – degrees of freedom, p – significance level

students and other symptoms in graduate students. Statistical differences between the mentioned groups, calculated by t-test, are presented below (table 8).

There were no statistically significant differences between undergraduate and graduate students in the expression of symptoms related to COVID-19 ($p < 0.05$), (table 8).

## Discussion

The rapid and sudden onset of the COVID-19 pandemic caused stress around the world and forced many countries to introduce specific measures to prevent the spread of the infection. The impact of the pandemic was felt in the entire population, especially among health workers and other essential workers who continued to perform their duties at workplaces during the pandemic [6,19,20]. Students, although not essential workers, found themselves among the high-risk population. Even before the pandemic, students were a risk population exposed to high levels of stress, with pronounced anxiety and depression. When, due to the pandemic, the way of studying changed, adapting to social isolation measures and switching to online studying, there was additional uncertainty related to academic success, future career, and social life. Furthermore, there was an additional burden on the mental health of this already vulnerable population [7,15-17,19,21,22]. The main goal of this research was to assess the presence and expression of stress symptoms related to the COVID-19 pandemic and to see the differences in the expression of stress symptoms among students at different levels of study and in different fields of study. During the research no other studies were found that used the Covid Stress Scale questionnaire to determine the amount and type of stress among medical university students. For stress and burnout syndrome assessment among medical students, questionnaires assessing resilience (Resilience Scale 14; RS-14), well-being (Medical Student Well-Being Index), and burnout (Maslach Burnout Inventory) were used. Looking at the results of our research, we can see that none of the tested symptoms of stress are significantly more pronounced among nursing students and other departments at the CUC. On the other side, a study conducted at a university in the United States of America in the Federal State of Nevada led to results according to which nursing students in Nevada statistically showed the most significant levels of stress, followed by students of other majors [23,24]. Statistically significant differences were found in the perception of nursing students regarding the stress of life compared to students who do not study nursing. Nursing students find their life stress levels significantly higher than non-nursing students. It was also established that nursing students have more significant knowledge about effective strategies for dealing with stress than students of other majors [23,24]. All symptoms of stress in our research were more pronounced in nursing students, except for traumatic stress, which was more pronounced among students of other majors. The significant impact of the pandemic on the mental health of health students was also observed at universities in Jordan, where significantly expressed symptoms of anxiety and depression were recognised [20]. Through our research, we obtained results that indicate that there is no significant expression of stress symptoms in both groups of students and that there are no significant differences between the groups. Danger and socioeconomic consequences and traumatic stress were somewhat more pronounced among undergraduate students, while symptoms related to xenophobia, contamination, and seeking help were somewhat more pronounced among undergraduate students. The presence of stress among students is also confirmed by research on medical students in the United States [25]. Their results indicate statistically significant lower levels of stress among students in the first year of study compared to students in the second, third and fourth year of

study, which contradicts our assumption that students at higher levels of study are more resistant to stress [25]. Research conducted in Poland among the general population of students across universities throughout the country indicates, among other things, that younger students who are at the beginning of their academic careers cope less effectively with stress [10]. Such conclusions are consistent with our hypothesis, but our research did not reach similar confirmatory results. Also, in the aforementioned research, it is concluded that this is largely a consequence of the fact that younger students do not yet have adequate life experience, and thus not enough competence to deal with difficult situations [26]. Consistent with our results, research results obtained from a study conducted among senior nursing students in Turkey showed that fear of COVID-19 and perceived stress levels among senior nursing students who were doing clinical practice during the pandemic were at a moderate level. Also, in accordance with our research, the age of the students did not significantly affect the perception of fear of COVID-19 and the level of perceived stress among the respondents [27]. The aforementioned research determined that the stress experienced by students during their clinical education did not differ from the stress experienced by students before the pandemic, and additionally, the fear of COVID-19 did not affect the perceived level of stress in the clinical environment during professional practice [27]. On the contrary, a study conducted among all majors of studies at the undergraduate level in the Brazilian state of Parana led to the conclusion that the prevalence of symptoms of depression, anxiety and stress among the examined undergraduate students is high and worrying [9]. The results of that research indicate that the pandemic has a significant impact on the mental health of students [9]. Furthermore, research conducted in Romania on graduate nursing students confirmed that during the COVID-19 pandemic, employed nursing students working in the healthcare system were more sensitive to stress compared to their unemployed colleagues [6]. The same research confirms that during the pandemic stress levels increased in both categories of respondents, which coincides with our research [6].

The results of our research showed that stress symptoms related to COVID-19 were not statistically significantly expressed and that there were no statistically significant differences between the tested groups in the presence and severity of stress symptoms. However, despite our results, it is important to note the presence of stress symptoms among the population, because an emergency like a pandemic has a different impact on each individual. Among the respondents stress related to danger stood out the most, followed by fear of contamination and seeking help, followed by xenophobia, economic consequences and, as the least pronounced, traumatic stress. Observing the groups of respondents according to the field of study, all symptoms are more prominent among nursing students, except for traumatic stress, which is most pronounced in students of other fields. Furthermore, observing the study levels, a more pronounced presence of danger, followed by socio-economic consequences and traumatic stress was observed among undergraduate students. Considering our research and studies that have been conducted around the world, it would be important to plan research that will provide answers to the long-term impacts and consequences of the pandemic, as well as to clearly identify populations that are at increased risk for the development of psychological problems.


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## Conflict of Interest

None to declare.

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