

PERCEIVED STRESS AMONG MEDICAL STUDENTS IN SERBIA DURING THE COVID-19 PANDEMIC

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ABSTRACT

Objective: To determine the level of perceived stress of students of the Medical Faculty in Novi Sad during the second year of the COVID-19 pandemic.

Material and method: This online cross-sectional survey, including 523 medical faculty students was conducted in February 2022. The Perceived Stress Scale was used to assess the level of perceived stress. Descriptive and inferential statistics were calculated using SPSS v22.

Results: The average score of the Perceived Stress Scale was 20.43 (SD ± 7.39), which suggests that students at the Faculty of Medicine of the University of Novi Sad experienced moderate levels of perceived stress in the second year of the COVID-19 pandemic. Female students experienced higher levels of perceived stress compared to male students. No significant difference was observed among the study programs or the year of study.

Conclusion: During the second year of the COVID-19 pandemic, medical students showed a moderate degree of perceived stress, whereas female students were significantly more affected. These results indicate the need for further assessment and promotion of students' mental well-being.

Keywords: students; COVID-19 pandemic; perceived stress; medical faculty.

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INTRODUCTION

Stress is a global phenomenon of modern lifestyles that has been found to adversely affect health and student learning, as well as many other aspects of life and work, and is therefore recognized as one of the most important issues of the modern world. ¹ Stress can be defined in various ways, either as a stimulus, a response, or a combination of both. ² According to Selye's (1976) definition, stress is a non-specific bodily response to any form of demand, while Holms and Rahe consider stress as a stimulus in itself that causes discomfort, and when its limits exceed tolerance, it can lead to psychological and physical issues. ^{3,4} Stress is also defined as a body's reaction to change which is a physical, mental, or emotional response, which if positive, encourages and motivates in-

dividuals to successfully finish tasks, or if negative, causes depression and reduces productivity. ⁵

The definition of stress, as proposed by Lazarus and Folkman, pertains to a unique relationship between an individual and their surroundings that the person perceives as challenging or surpassing their abilities, ultimately putting their well-being at risk. ⁶ Despite the situations that can have a stressful effect on most people, individuals interpret and assess their personal circumstances based on their own subjective standards, and respond to them in their own, unique way. ² During the Covid-19 pandemic and quarantine, people faced many emotional and physical consequences of social distancing, which affected the human psyche to varying degrees. ^{7,8} It has led to a significant global crisis due to its rapid spread and high morbidity and mortality. ⁹ The rapid increase in morbidity and mortality as a result of the COVID-19 pandemic has caused stress among the entire population as well as among students and may have unwanted effects on both, their psychological well-being and academic life. ¹⁰ Globally, higher education institutions have closed their teaching bases, in whole or in part, to limit the rapid spread of SARS-CoV-2 infection. Universities have been forced to replace live classes with online classes, causing major changes in teaching and learning.

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The pandemic has had a detrimental impact on the educational credibility of medical study programs, particularly in terms of clinical instruction, which is a crucial component of medical education.¹¹ In addition, many faculties emphasize the irreplaceable value of attending live classes, pointing out the importance of real-time feedback and feedback that develops in class, which is difficult to achieve through online platforms.¹² Despite the prompt institutional response to COVID-19, which pledges to furnish academic assistance to students with minimal disturbance, the rapid and sudden restructuring may serve as a trigger for students who are already experiencing high levels of academic stress.¹¹ The learning process of medical graduates can be negatively affected by stress, resulting in inadequate academic performance. This can further result in feelings of distress, depression, and an array of psychological issues.¹⁴ Available studies conducted before the pandemic suggest that medical school students are more susceptible to mental health issues than the general population, with academic stress being recognized as the primary predictor.^{5, 10, 12}

This study was conducted to assess the perceived stress among medical students during the second year of the COVID-19 pandemic.

MATERIAL AND METHODS

This cross-sectional study was conducted in February 2022, at the Faculty of Medicine in Novi Sad, Serbia. The sample consisted of 523 medicine, pharmacy, dentistry, nursing, medical rehabilitation, and special education and rehabilitation students, aged 18 to 37. The information was gathered using an online survey, which was distributed via various social media platforms such as Facebook, Instagram, and WhatsApp. The questionnaire consisted of two parts: 1) Demographic data: gender, age, year of study, and study program; 2) Perceived Stress Scale (PSS-10), which was created by Cohen et al. (1983), is the most widely used open-access psychological instrument for evaluating an individual's perception of stress.¹⁵ It consists of 10 questions and students' answers to each were ranked on a five-point Likert scale from 0 to 5. The score of the questionnaire ranged from 0 to 40, where a lower score indicated a lower degree of perceived stress. Psychometric testing of the PSS-10 in existing studies showed that the questionnaire has good internal consistency. Cronbach alpha (α) values ranged from 0.82 to 0.84.^{16, 17} All data were collected anonymously and voluntarily, and every participant provided informed consent. The study was approved by the ethical committee of the Faculty of Medicine in Novi Sad (February 2022; nr. 01-39/143/1). The software used for statistical data processing was Statistical Package for Social Sciences (version 23)

RESULTS

Out of the total of 523 students, 86% were female,

the remaining 14% were male students and the average age of the students was 21.5 years. Most of the respondents were in their third (25%), fourth (24%), and first year (23%) of studies. Among study programs, general medicine and pharmacy students were in the majority, making up around 55% of the respondents, as shown in Table 1.

The average score of the perceived stress scale was 20.43 (SD \pm 7.39), which indicates a moderate level of stress among students of the Faculty of Medicine in Novi Sad during the second year of the COVID-19 pandemic. The Cronbach α coefficient of the scale in our research was 0.84, indicating good internal consistency. The students reported feeling stressed out and being unable to control anger when things don't go according to plan more often than not. However, they didn't report struggling with being on top of things and their confidence in dealing with problems and irritations in their lives. Table 2 shows detailed insight into the scores of the questionnaire. By comparing the PSS-10 scores according to gender, we obtained a statistically significant difference in the female students' score results (ANOVA; $p=0.000$; $p<0.05$). However, by comparing the scores according to the study program and year of study, statistically significant results weren't obtained. Test and significance results are shown in Table 1.

DISCUSSION

The COVID-19 pandemic has, until now, had a substantial impact on everyday life, both due to the mandatory physical distancing and self-isolation of the sick, as well as due to the practice of mandatory usage of masks and epidemiological measures that are in force. These comprehensive public health measures and social and physical isolation contribute to feelings of distress and elevated levels of anxiety and stress.¹⁸ The rapid increase in morbidity and mortality contributes to the increase in stress levels, increasing uncertainty about what the future brings.¹⁹

The majority of the respondents of our study were female medical students, which was the case with most of the available literature except two studies, conducted in Poland and China, where male students made up more than 50% of the sample.^{11, 20, 24-26} In our study, the first, third, and fourth year of study students were present in the highest number.

The Perceived Stress Scale is an excellent instrument for evaluating the experience of unpredictability, burden, and lack of control over events in life, therefore shows excellent psychometric properties.³⁰ The mean score of 20.43 \pm (SD=7.39) in our study defines moderate levels of perceived stress among medical students, which aligned with most available studies.^{18, 20, 22, 25, 30} However, a study conducted in China by Zhang et al. reports high levels of perceived stress among their students, which

Table 1: Distribution of PSS-10 results according to sex, year of study, and study program

	N	Percentage %	PSS-10 X ± SD	Test and significance	
Gender					
Male	74	85.85	17.2 ± 7.3	p=0.000 (p<0.05)	
Female	449	14.115	20.9 ± 7.4		
Year of Study					
1	122	23.14	20.34 ± 7.45	p=0.118 (p>0.05)	
2	90	17.40	21.71 ± 7.08		
3	130	24.86	19.35 ± 7.27		
4	125	23.90	21.28 ± 7.19		
5	36	6.88	18.97 ± 8.46		
6	20	3.82	19.60 ± 8.28		
Study program					
General Medicine	166	31.74	19.92 ± 7.67	p=0.105 (p>0.05)	
Pharmacy	126	24.09	21.71 ± 6.96		
Stomatology	59	11.28	20.88 ± 7.37		
Nursing					
4th-Year program	74	14.15	19.57 ± 7.26		
3rd-Year program	10	1.91	23.00 ± 6.85		
Medical rehabilitation	36	6.88	19.80 ± 7.65		
Special education and rehabilitation	34	6.50	21.03 ± 7.84		
Masters in Nursing	13	2.49	18.46 ± 5.32		
Doctorate studies	5	0.96	13.20 ± 6.90		

Table 2: Distribution of PSS-10 scores of individual questions.

	M	SD
1. In the last month, how often have you been upset because of something that happened unexpectedly?	2.46	±1.17
2. In the last month, how often have you felt that you were unable to control the important things in your life?	2.21	±1.28
3. In the last month, how often have you felt nervous and stressed?	3.00	±0.92
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	1.37	±1.06
5. In the last month, how often have you felt that things were going your way?	1.61	±1.14
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	2.25	±1.25
7. In the last month, how often have you been able to control irritations in your life?	1.30	±1.15
8. In the last month, how often have you felt that you were on top of things?	1.43	±1.12
9. In the last month, how often have you been angered because of things that happened that were outside of your control??	2.67	±1.10
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	2.14	±1.28
Perceived Stress Scale Total Score X ± SD	20.4 ± 7.4	

can be explained by the fact that in this country ever since the beginning of the pandemic a complete lockdown has been in force.²⁸

A study conducted among students in 9 countries, by Ochnik et al., states higher levels of perceived

stress, in comparison with moderate levels of anxiety and depression among students of the same study.²¹ Along with these results, this cross-national study points out that female students are at a significantly greater risk of perceived stress across most of the surveyed countries. A statistically significant higher level of perceived stress

among female students was observed in our study as well. Most of the studies consulted reported similar findings of a significantly higher level of perceived stress among female students, as well as another study conducted in our country in 2021, among the students at the University of Niš, by Kostić et al.^{22, 23, 29}

Our respondents mentioned frequent feelings of nervousness, stress, and anger due to things they couldn't control in the last month. However, they emphasize that their problems do not accumulate so often and in such amounts that they're impossible to overcome. The feeling that things rarely and never go according to plan was mentioned by only 20% of students. The study by Awoke et al. reports similar results, except a more frequent feeling that things are not going according to students' plans.³⁰

In terms of statistical significance according to the year of study, such wasn't found in our research, the students showed moderate levels of perceived stress across all study years. Meanwhile, research by Torun et al. reports a higher level of perceived stress among senior medical students.²³ These results are explained by the structure of the medical study program in Turkey, which consists of three years of theoretical teaching (preclinical phase) and three years of exclusively practical teaching (clinical phase).²³ Due to the structure of the study programs, medical students in Serbia are exposed to clinical settings and practical teaching from the first year of their studies, which explains the distribution of most perceived stress among 2nd year in our study.

Guo's research on a sample of 852 students of the Faculty of Medicine found a significantly higher degree of stress in students in the third and fourth years.¹⁸ Similar study results were published by Sheroun et al., conducted among 427 healthcare students in India, where despite the moderate level of stress of the examined students (PSS-10=21.8), significantly high levels of stress among students in the fourth, final year of study were highlighted.²⁷

One of the limitations that could affect the results of the research is related to the ongoing examination period at the time of conducting the data. Stress could certainly be further increased due to this fact. An additional limitation refers to the fact that of the total number of regular students of the Faculty of Medicine, University of Novi Sad (4871), only 523 of them filled out the questionnaire, and in the general demographic data, we did not record variables such as marital status, work relationship, material status, social, etc.

CONCLUSION

In the second year of the COVID-19 pandemic, students enrolled in the Faculty of Medicine at the University of Novi Sad displayed a moderate level of perceived stress. The statistically significant difference found

in the levels of stress according to gender indicates that female students are at a greater risk of perceived stress. The PSS-10 questionnaire has shown to be an excellent tool for quick and easy assessment of parameters necessary for the timely planning of prevention and alleviation of stress among students. Hence, further assessment of feelings and experiences, as well as adequate strategies to improve the psychological well-being of the students are essential.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

- Gajić M:** Concept, Critical appraisal, and Discussion Writing
- Mikić M:** Data collection, compilation of results, formatting of the article
- Arandelović B:** Data Collection, Manuscript writing
- Dujlović G:** Manuscript Writing, Bibliography
- Ninić M:** Overall compilation of the article
- Stanić M:** Supervision, Critical appraisal

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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