Coronavirus Pandemic

Knowledge, attitudes and practices and fear of COVID-19 among medical students in Serbia

Zorica Terzic-Supic[1], Jovana Todorovic[1], Milos Bajcetic[2], Janko Jankovic[1], Milena Santric-Milicevic[1], Zeljka Stamenkovic[1], Bosiljka Djikanovic[1], Stefan Mandic-Rajcevic[1], Pavle Piperac[3], Aleksandra Jovic-Vranes[1], Bojana Matejic[1]

[1] Institute of Social Medicine, Faculty of Medicine, University of Belgrade, Belgrade, Serbia
[2] Institute for Histology and Embryology, Faculty of Medicine, University of Belgrade, Belgrade, Serbia
[3] Department of Humanities, Faculty of Medicine, University of Belgrade, Belgrade, Serbia

Abstract
Introduction: The outbreak of the disease caused by the novel coronavirus, SARS-CoV-2 named COVID-19 has spread throughout the world. The number of registered cases is increasing and almost no country or territory worldwide has been without any COVID-19 patient. The aim of this study was to examine the level of knowledge on the SARS-COv-2 and COVID-19 among medical students and to explore the differences in attitudes, practices and fear of COVID-19 among students with sufficient and students with insufficient knowledge.
Methodology: The cross-sectional study among the 1,722 medical students was conducted through an online platform of the Faculty of Medicine, University of Belgrade. The instrument used was a questionnaire with sections on socio-demographic characteristics, knowledge, attitudes and practices towards COVID-19 and the Fear of COVID-19 scale.
Results: Total of 1576 (91.50%) students were in the sufficient knowledge group. The multivariate logistic regression analysis showed that there was a significant association between the sufficient knowledge on COVID-19 and female sex (OR = 1.70, 95% CI = 1.18-2.45), age (OR = 1.10, 95% CI = 1.02-1.18), considering the preventive measures enforced in Serbia as good (OR = 2.57, 95% CI = 1.18-5.56), wearing the surgical mask outside of the household in the past 14 days (OR = 1.87, 95% CI = 1.22-2.87) and score on Fear of COVID-19 scale (OR = 0.94, 95% CI = 0.91-0.98).
Conclusions: Medical students showed good knowledge of COVID-19 and could be a part of the promotion of health education messages as a part of preventive measures.

Key words: Knowledge; attitudes; practices; COVID-19; fear of COVID-19.

Introduction

The outbreak of the disease caused by the novel coronavirus, SARS-CoV-2 named COVID-19, which began in China in late December 2019, has spread throughout the world. The number of registered cases is increasing and almost no country or territory worldwide has been without any COVID-19 patient [1].

The World Health Organization (WHO) declared the global public health threat on January 31st and pandemic on March 11th [2]. Toprevent the spread of the outbreak, China was the first country to enforce the preventive measures on the part of its territory, as the entire city of Wuhan with the surrounding area was put in strict quarantine [3]. Following the increase in the number of registered cases worldwide, preventive measures were enforced in many countries, including quarantine, lockdowns, self-isolation, social distancing and closure of borders. At one point almost 3 billion people throughout the world were in some sort of home quarantine [4].

As the disease is new, many uncertainties were associated with it and the knowledge on the virus, the epidemiological and clinical characteristics of the disease were gathered during the outbreak, especially at the early stages. These uncertainties and the lack of preparedness for a strategic communication plan led to many misconceptions among the general population, but also among the health care workers. The differences in preventive measures enforced in different countries also differed as a consequence of these uncertainties [5].

The adherence to the preventive measures was shown to be associated with the level of knowledge on the disease, especially on routes of transmission and

clinical characteristics [6]. As most of the countries are still facing the COVID-19 outbreak and most of the experts are expecting the virus to return in autumn in the northern hemisphere even in the countries which have managed to successfully control the initial wave of the outbreak [7], it is very important to provide as much of the educational messages for the general public as possible.

The health care workers and the medical students have been in the frontline of the fight against the outbreak in some countries. Final year students were involved in the triage and treatment of patients, while others were involved in the provision of information to the general public through the free phone lines, forums, or social networks [8-10]. To provide the proper information to the general public, the knowledge of the medical students has to be adequate. In the times of social media and the fast spread of information, there is also the fast spread of misconceptions about COVID-19, especially among the general population [11]. The current and future health care professionals have a major role in the provision of health education and can serve as myth busters to the general population [11].

Due to the novelty of the virus and the fast spreading of the COVID-19 disease, the preventive measures enforced in Serbia were very strict. However, the messages provided were inconsistent, contributing to the confusion and increase in the levels of anxiety and the fear of contracting COVID-19 among the general population [11,12]. Knowledge and perceived risk of infection are associated with compliance to preventive measures [6,13], while hatred and stigma due to fear can delay help-seeking [14], all of which contribute to poor epidemiological control of the disease since some mild COVID-19 cases remain unidentified.

The aim of this study was to examine the level of knowledge on the SARS-COv-2 and COVID-19 among medical students and to explore the differences in attitudes, practices and fear of COVID-19 among students with sufficient and students with insufficient knowledge.

Methodology
Study design and sample
The cross-sectional study was conducted among 1,722 medical students of all study years at the Faculty of Medicine, University of Belgrade, between May the 1st and May the 15th 2020. The study was conducted at the end of the first wave of the outbreak, with the total number of new daily cases on May 1st 285, while the total number of daily cases on May 15th was 79 [15,16].

Students were given an online questionnaire to fill out, with the link provided on the home page of the online platform of the Faculty (Moodle platform), for distance learning during the COVID-19 pandemic. The response rate was 57.4% that is 1,722/3,000.

Instruments
The study instrument was the questionnaire designed specifically for this study using questionnaires from similar studies [17,18]. The questionnaire consisted of three sections: 1) general characteristics (demographic, socioeconomic characteristics, study year and self-rated health status); 2) knowledge on Sars-CoV2 and COVID-19 (12 questions on clinical presentations, transmission routes and the prevention and control measures); 3) attitudes on COVID-19 (towards the enforced preventive measures in Serbia, the success in controlling the outbreak in Serbia, and towards the control of the pandemic globally); 4) practices regarding COVID-19 outbreak (being in crowded places in the past two weeks and wearing the masks outside the households in the past two weeks); and 5) Fear of COVID-19 scale (a seven-item scale of symptoms and signs of fear and anxiety associated with the current COVID-19 outbreak). No questions in the questionnaire were marked as 'obligatory' and students could leave any question unanswered. The questionnaire was translated and back-translated according to the recommendations by the WHO [19].

The questions on knowledge, attitudes and practices were adapted from the previous research [18]. The intraclass correlation coefficient (ICC) in this section of the questionnaire was > 0.90.

Outcome variable
The 12 questions about the knowledge on COVID-19 were presentedas statements and the possible answers were "true", "false" and "I do not know". Out of these 12 questions, four regarded clinical presentations, three transmission routes and five questions regarded prevention and control. Each correct answer scored 1 point. Based on the total number of correct answers the students were classified into two groups (sufficient knowledge with 9 or more out of 12 and insufficient knowledge with 8 or less than 8 correctly answered questions). All the answers "I do not know" were considered incorrect answers. The score of 9/12 was chosen as the fifth percentile of the score range falls on the score of 8/12 and all students above that threshold were considered to have sufficient knowledge [20].

Covariates

Fear of COVID-19 scale is a seven-item scale referring to the symptoms and signs of fear and anxiety associated with the current COVID-19 outbreak. The answers on this scale were presented on five points Likert scale ranging from 1-strongly disagree to 5-strongly agree [17]. The score on the scale varies between 7 and 35. The Cronbach alpha was $\alpha = 0.824$.

A total of 13 variables were analyzed. These were sex, age, place of residence, study year, subjective financial status, self-rated health, attitude towards the preventive measures enforced in Serbia, attitude toward the successfulness of Serbia in controlling the outbreak, attitude towards the control of the pandemic globally, practices of visiting crowded places in the past two weeks, practices of wearing the surgical masks outside the households in the past two weeks, score on Fear of COVID-19 scale and sufficient knowledge on COVID-19.

The Ethical Committee of the Medical Faculty University of Belgrade approved the study (decision No 1322/V-17, dated 28.05.2020). Before filling out the form, all participants provided informed electronic consent to anonymously participate in the study and permittedto researchers to use the data.

Statistical analysis

The statistical analyses were done using the methods of descriptive and analytical statistics. The chi-square test was used to examine the differences between the categorical variables, while the significance of the difference between the continuous variables was examined using the Mann-Whitney U test. All variables which were shown to be significant were then entered in the multivariate logistic regression analysis with sufficient knowledge as an outcome variable. Odds ratios (ORs) and 95% confidence intervals (CIs) were reported for logistic models. The $p < 0.05$ was taken as a nominal level of statistical significance. All analyses were done using the Statistical Package for Social Sciences, SPSS 22.0.

Results

The majority of our participants were female (1,220/1,722, 70.8%). The average age of our participants was 22.26 ± 3.33 years and 1,536 (89.2%) of them lived in urban areas.

The students showed good knowledge on the majority of questions regarding the characteristics of the SARS-CoV-2 and the COVID-19. The percentage of the correct answers to the questions varied between 1.9% and 99.2%. The frequencies of answers to all statements in the questionnaire on COVID-19 knowledge are presented in Table 1.

The average score for each question on a Fear of COVID-19 scale varied between 1.29 ± 0.58 and 2.44 ± 0.96 while the average total score was 12.91 ± 4.50 (Table 2).

Table 1. Medical students' knowledge on COVID-19.

Statement (correct answer)	True	False	I do not know
	N (%)	N (%)	N (%)
The most common symptoms of COVID-19 are fever, dry cough and myalgia (true)	1,554 (90.2)	114 (6.6)	54 (3.1)
Unlike the common cold, runny nose and sneezing are less common in COVID-19 patients (true)	1,310 (76.1)	228 (13.2)	184 (10.7)
There is no specific treatment for COVID-19 but adequate symptomatic and supportive therapy can help most of the patients to recover (true)	1,586 (92.1)	41 (2.4)	95 (5.5)
Severe cases of the disease are seen in only some patients. Elderly, people with chronic illnesses and obesity are at increased risk of severe forms of the disease (true)	1,569 (91.1)	114 (6.6)	39 (2.3)
Contact with wild animals or consumption of their meet can lead to COVID-19 infection (false)	370 (21.5)	845 (49.1)	507 (29.4)
Patients with COVID-19 cannot infect others if they do not have fever (false)	160 (9.3)	1521 (88.3)	41 (2.4)
SARS-CoV-2 spreads through respiratory droplets (true)	1,678 (94.9)	15 (0.9)	29 (1.7)
People can prevent spreading of the disease by wearing surgical masks (true)	1,052 (61.1)	496 (28.8)	174 (10.1)
Children and adolescents do not have to follow the preventive measures for COVID-19 (false)	33 (1.9)	1,672 (97.1)	17 (1.0)
In order to prevent the spreading of COVID-19, the public transport, buses and trains, as well as mass gatherings should be avoided (true)	1,708 (99.2)	5 (0.3)	9 (0.5)
Isolation and hospital treatment are efficient measures for prevention of COVID-19 (true)	1,681 (97.6)	12 (0.7)	29 (1.7)
People who were in contact with the person infected should be immediately isolated. On average, these persons are followed for 14 days (true)	1,663 (96.6)	28 (1.6)	31 (1.8)

Table 2. Medical students' fear of COVID-19.

Item	Average score	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	X ± SD	N (%)	N (%)	N (%)	N (%)	N (%)
I'm very afraid of COVID-19	2.44 ± 0.96	323 (18.8)	541 (31.4)	652 (37.9)	181 (10.5)	25 (1.5)
I feel uncomfortable thinking about COVID-19	2.20 ± 1.12	601 (34.9)	484 (28.1)	376 (21.8)	219 (12.7)	42 (2.4)
My palms are sweating when I'm thinking about COVID-19	1.41 ± 0.71	1,199 (69.6)	383 (22.2)	111 (6.4)	21 (1.2)	8 (0.5)
I'm afraid I could die if I get infected with COVID-19	1.83 ± 0.91	757 (44.0)	610 (35.4)	263 (15.3)	73 (4.2)	19 (1.1)
I get nervous or anxious when I watch or read the news on COVID-19	2.27 ± 1.22	619 (35.9)	440 (25.6)	320 (18.6)	267 (15.5)	76 (4.4)
I cannot sleep because of a worry that I might get COVID-19	1.29 ± 0.58	1,315 (76.4)	337 (19.6)	57 (3.3)	7 (0.4)	6 (0.3)
My heart races or palpitates when I think about getting COVID-19	1.48 ± 0.77	1,149 (66.7)	391 (22.7)	125 (7.3)	50 (2.9)	7 (0.4)
Total score	**12.91 ± 4.50**					

Table 3. Characteristics of students in sufficient and insufficient knowledge group.

Characteristics		Total sample N (%)	Sufficient knowledge N (%)	Insufficient knowledge N (%)	p-value
Age		22.26 ± 3.33	22.32 ± 3.33.	21.68 ± 3.27	0.028
Sex	Male	502 (29.2)	445 (28.2)	57 (39.0)	< 0.001*
	Female	1,220 (70.8)	1,131 (71.8)	89 (61.0)	
Year of study	First	308 (17.9)	274 (17.4)	34 (23.3)	
	Second	368 (21.4)	334 (21.2)	34 (23.3)	
	Third	386 (22.4)	351 (22.3)	35 (24.0)	
	Fourth	283 (16.4)	263 (16.7)	20 (13.7)	0.219
	Fifth	213 (12.4)	198 (12.6)	15 (10.3)	
	Sixth	163 (9.5)	155 (9.8)	8 (5.5)	
	Total	1,721			
Type of residence	Urban	1,536 (89.2)	1,413 (89.7)	123 (84.2)	
	Rural	186 (10.8)	163 (10.3)	23 (15.8)	0.044*
	Total	1,722			
Subjective financial status	Very poor	4 (0.2)	4 (0.3)	0 (0)	
	Poor	32 (1.9)	28 (1.8)	4 (2.7)	
	Average	503 (29.2)	453 (28.7)	50 (34.2)	0.504
	Good	958 (55.6)	885 (56.2)	73 (50.0)	
	Very good	225 (13.1)	206 (13.1)	19 (13.0)	
	Total	1,722			
Self-rated health	Very poor	0 (0)	0 (0)	0 (0)	
	Poor	15 (0.9)	13 (0.8)	2 (1.4)	
	Average	159 (9.2)	143 (9.1)	16 (11.0)	0.784
	Good	999 (58.0)	917 (58.2)	82 (56.2)	
	Very good	549 (31.9)	503 (31.9)	46 (31.5)	
	Total	1,722			
Serbia will be successful in fighting the epidemics	Yes	1,589 (92.3)	1,458 (92.5)	131 (89.7)	
	No	133 (7.7)	118 (7.5)	15 (10.3)	0.228
	Total	1722			
How would you rate measures in Serbia	Very bad	62 (3.6)	51 (3.2)	11 (7.5)	
	Bad	122 (7.1)	103 (6.5)	19 (13.0)	
	Average	551 (32.0)	497 (31.5)	54 (37.0)	< 0.001*
	Good	783 (45.5)	735 (46.6)	48 (32.9)	
	Very good	204 (11.8)	190 (12.1)	14 (9.6)	
	Total	1,722			
Will COVID-19 pandemic be successfully controlled	Yes	1,409 (81.8).	1,299 (82.4)	110 (75.3)	
	No	313 (18.2)	277 (17.6)	36 (24.7)	0.034*
	Total	1,722			
Been in place with lot of people in the past 14 days	Yes	1,574 (91.4)	128 (8.1)	20 (13.7)	
	No	148 (8.6)	1,448 (91.9)	126 (86.3)	0.021*
	Total	1,722			
Wore a mask outside of the house	Yes	1,471 (85.4)	1,362 (86.4)	109 (74.7)	
	No	251 (14.6)	214 (13.6)	37 (25.3)	< 0.001*
	Total	1,722			
Fear Score		**12.91 ± 4.50**	**12.83 ± 4.41**	**13.74 ± 5.33**	**0.020***

* Statistically significant numbers.

A total of 1,576/ 1,722 students had sufficient knowledge (91.5%), while 146 (8.5.%) of them had insufficient knowledge of COVID-19. The mean score on the knowledge scale was 10.03 ± 1.34, the median score was 10.00. The score varied between 0 and 12. Participants with sufficient and participants with insufficient knowledge differed significantly on sex, age, place of residence, rating of measures in Serbia, the attitude toward the possibility of control of COVID-19, the preventive practices (been in crowded places, wore a mask outside of the household) and the average score on the Fear of COVID-19 scale. The characteristics of the participants in both sufficient and insufficient knowledge groups are presented in Table 3.

The multivariate logistic regression analysis showed that there was a significant association between the sufficient knowledge on COVID-19 and female sex (OR = 1.70, 95% CI = 1.18-2.45), age (OR = 1.10, 95% CI = 1.02-1.18), considering the preventive measures enforced in Serbia as good (OR = 2.57, 95% CI = 1.18-5.56), wearing the mask outside of the household in the past 14 days (OR = 1.87, 95% CI = 1.22-2.87) and score on Fear of COVID-19 scale (OR = 0.94, 95% CI = 0.91-0.98). The results of the multivariate logistic regression analyses with sufficient knowledge on COVID-19 as an outcome variable are presented in Table 4.

Discussion

In any country, the success of preventive measures in place is based on compliance with them. The compliance is based on knowledge among those enforcing measures, but also health care workers and everyone who showsan example for the general population. More than 90% of our students had sufficient knowledge of the disease, without the significant differences between the study years. Our study also showed that the sufficient knowledge on COVID-19 was associated with the female sex, older age, considering the preventive measures enforced in Serbia as good, wearing the surgical mask outside of the household in the past 14 days and score on Fear of COVID-19 scale.

The results of our study showed that a high percentage of students had sufficient knowledge of COVID-19, which is in accordance with the previous study conducted among the residents in China [18], using the same questionnaire. The lowest percentage of the correct answers in our study was for the question on the possibility of COVID-19 transmission through uncooked meat and contact with wild animals. This is in accordance with the previous study [21] and it was hypothesized that it is due to the link of COVID-19 with the wet market in Wuhan, but also with the association of other recent large outbreaks with the zoonotic origin, such as SARS, Middle Eastern Respiratory Syndrome (MERS) and Ebola [21] and belief that the consumption of undercooked meat may be associated with the spread of the disease. There is a need for further research of beliefs and misconceptions in the case of COVID-19. The previously mentioned study in China also showed that more than 90% of participants believed that COVID-19 will be successfully controlled [18]. The percentage of the participants who stated that COVID-19 will be successfully controlled in our study was high in both groups (82.4% sufficient knowledge and 75.3% insufficient knowledge). The higher knowledge scores

Table 4. Multivariate logistic regression analysis with medical students' sufficient knowledge as an outcome variable.

Characteristics		OR (95% CI)
Sex	Male	1.0 reference category
	Female	1.70 (1.18-2.45)*
Age		1.10 (1.02-1.18)*
Type of residence	Urban	1.0 reference category
	Rural	0.62 (0.38-1.00)
How would you rate measures in Serbia	Very bad	1.0 reference category
	Bad	0.99 (0.42-2.30)
	Average	1.62 (0.76-3.46)
	Good	2.57 (1.18-5.56)*
	Very good	2.19 (0.88-5.42)
Will COVID-19 pandemic be successfully controlled	Yes	1.14 (0.74-1.76)
	No	1.0 reference category
Been in place with lot of people in the past 14 days	Yes	0.64 (0.37-1.08)
	No	1.0 reference category
Wore a mask outside of the household	Yes	1.87 (1.22-2.87)*
	No	1.0 reference category
Fear Score		**0.94 (0.91-0.98)***

* Statistically significant numbers.

were previously associated with a lower likelihood of not agreeing that the outbreak will be successfully controlled [18]. Unfortunately, two months after our study was conducted, Serbia is still far from succeeding in control of the outbreak and the numbers of daily cases are constantly increasing [22].

The participants with sufficient knowledge had a 2.6 times higher likelihood to rate the preventive measures enforced by the Serbian government as good compared to very bad as a reference category. There was no significant difference between other ratings in comparison with the rating "very bad" as a reference category. Serbia had enforced one of the strictest preventive measures in entire Europe and did it relatively early in the outbreak, which is why the measures might have been rated as good. However, some might have seen the measures enforced as unnecessarily strict as the curfews may have caused the crowds in the pharmacies and the supermarkets during their short working hours and this strictness might have been considered as counter-effective, which is why the measures were rated as "very good" in the low percentage.

There was a significantly higher frequency of compliance with preventive practices among students in the group with sufficient knowledge.. Students with sufficient knowledge had almost two times higher likelihood to wear surgical masks outside their households compared to the students with insufficient knowledge. The knowledge on the importance of wearing a mask and the correct way of wearing a mask is significant for the entire population and especially for medical students as they can serve as role models and are in contact with many people. A study among medical students in Pakistan showed that more than 86% of students wore masks outside of theirhomes [23], similar to our study. In comparison, only 39.8% of the students in Jordan reported wearing a mask when leaving the household[24]. A previous study on the association of anxiety and preventive practices showed that students who had higher levels of anxiety associated with the MERS were more likely to adhere to preventive practices [25]. In our study, students with sufficient knowledge were more likely to adhere to preventive practices, although the sufficient knowledge was negatively associated with the score on the Fear of COVID-19 scale. Fear of any infectious disease is associated with its modes of transmission and its morbidity and mortality. In the case of COVID-19, the fear is usually aggravated by the novelty of the disease and the low levels of knowledge on it [25]. The prolonged state of fear and insecurity can negatively influence population mental health, and the real consequences will be seen in the coming years.

The main strength of our study is in the sample size, as it includes more than 1,700 medical students of the largest Medical Faculty in Serbia. To the best of our knowledge, this is the first study examining the knowledge, attitudes and practices on COVID-19 in the Western Balkan region. Also, our study used and validated the Fear of COVID-19 scale, which can be used in future studies. Nevertheless, several drawbacks should be briefly stressed. This was an online survey, and the response rate in online surveys is generally lower than in off-line surveys and is usually around 29% [26] and we considered our response rate satisfactory. The main limitation is the cross-sectional study design which did not allow establishing the causal relationships. Another limitation is related to medical students as the only ones who participated in the study, and although their role in the spread of information during the outbreak is of high significance it would be very important to assess the knowledge and especially, practices regarding the COVID-19 among the general population. The time period of the research may have influenced our results, as the outbreak in Serbia already lasted for eight weeks when the study started, and the majority of participants may have gathered more information on the disease. In addition, students' practices might have been impacted by the belief that young people are less susceptible to the COVID-19. .

Conclusions

Our study shows that more than 90% of students have sufficient knowledge of COVID-19. The association of sufficient knowledge with the adherence to preventive practices as well as with lower levels of Fear of COVID-19 is important for the predicted second wave of the pandemic. As future physicians, the medical students may have a significant role in the provision of educational messages for the general public in order to avoid non-adherence with preventive measures and panic if, or when the second and third waves of the pandemic occur.

Acknowledgements

References

1. World Health Organization (WHO) (2020) Coronavirus disease (COVID-2019). Situation report-139. Geneva: World Health Organization.
2. Liu X, Na R, Bi ZQ (2020) Challenges to prevent and control the outbreak of Novel Coronavirus Pneumonia (COVID-19). Zhonghua Liu Xing Bing Xue Za Zhi 41: 994-997. [Article in Chinese]
3. Rothan H, Byrareddy S (2020) The epidemiology and pathogenesis of Coronavirus disease (COVID-19) outbreak. J Autoimmun 109: 102433–102437.
4. Blavatnik School of Government, University of Oxford (2020) Covid-19 government response tracker. Available: https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker. Accessed: 30 may 2020.
5. Luan R, Wang X, Sun X, Chen XS, Zhou T, Liu QH, Lu X, Wu, XP, Gu DQ, Tang MS, Cui HJ, Shan XF, Ouyang J, Zhang B, Zhang w, Emergency research Group Sichuan University Covid-19 (2020) Epidemiology, treatment, and epidemic prevention and control of the Coronavirus Disease 2019: a review. Sichuan Da Xue Xue Bao Yi Xue Ban 51: 131–138. [Article in Chinese]
6. Gao H, Hu R, Yin L, Yuan X, Tang H, Luo L, Chen M, Huang D, Wang Y, Yu A, Jiang Z (2020) Knowledge , attitudes and practices of the Chinese public with respect to coronavirus disease (COVID-19): an online cross- sectional survey. BMC Public Heatlh 20: 1816–1824.
7. Xu S, Li Y (2020) Beware of the second wave of COVID-19 Global coalition to accelerate COVID-19 clinical research in resource-limited settings. Lancet 395: 1321–1322.
8. Soled D, Goel S, Barry D, Erfani P, Joseph N, Kochis M, Uppal N, Velasquez D, Vora K, Scott, KW (2020) Medical student mobilization during a crisis: lessons from a COVID-19 medical student response team. Acad Med 95: 1384-1387.
9. Miller DG, Pierson L, Doernberg S (2020) The role of medical students during the COVID-19 pandemic. Ann Intern Med 173: 145-146.
10. Stokes D (2020) Senior medical students in the COVID-19 response: an opportunity to be proactive. Soc Acad Emerg Med 27: 343-345.
11. Roy D, Tripathy S, Kumar S, Sharma N (2020) Study of knowledge, attitude, anxiety and perceived mental healthcare need in indian population during COVID-19 pandemic. Asian J Psychiatr 51: 102083.
12. Depoux A, Martin S, Karafillakis E, Preet R, Wilder-Smith A, Larson H (2020) The pandemic of social media panic travels faster than the COVID-19 outbreak. J Travel Med 3: 54–67.
13. Vally Z (2020) Public perceptions, anxiety and the perceived efficacy of health- protective behaviours to mitigate the spread of the SARS-Cov-2/ COVID-19 pandemic. Public Health 187: 67–73.
14. Bruns DP, Kraguljac NV, Bruns TR (2020) COVID-19: facts, cultural considerations, and risk of stigmatization. Clin Pr 31: 326–332.
15. World Health Organization (WHO) (2020) Coronavirus disease (COVID-2019). Situation report-116. Geneva: World Health Organization.
16. World Health Organization (WHO) (2020) Coronavirus disease (COVID-2019). Situation report-102. Geneva: World Health Organization.
17. Ahorsu DK, Lin C, Imani V, Saffari M, Griffiths MD, Pakpour AH (2020) The Fear of COVID-19 scale: development and initial validation. Int J Ment Health Addict 27: 1-9.
18. Zhong B, Luo W, Li HM, Zhang QQ, Liu XG, Li WT (2020) Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. Int J Biol Sci16: 1745–1752.
19. World Health Organization (WHO) (2019) Management of substance abuse. Process of translation and adaptation of instruments. Available: https://www.who.int/substance_abuse/research_tools/translation/en/. Accessed: 1 june 2020.
20. Biddle RE (1993) How to set cutoff scores for knowledge tests used in promotion, training, certification, and licensing. Public Pers Manage 22: 63–79.
21. Bhagavathula AS, Aldhaleei WA, Rahmani J, Mahabadi MA, Bandari DK (2020) Knowledge and perceptions of COVID-19 among health care workers: cross-sectional study. JMIR public Heal Surveill 6: e19160–e19160.
22. World Health Organization (WHO) (2020) Coronavirus disease (COVID-2019). Situation report-182. Geneva: World Health Organization.
23. Khola N, Rubab Z, Umar M, Rehman R, Baig M, Baig F (2020) Knowledge, attitudes, and practices against the growing threat of COVID-19 among medical students of Pakistan. PLoS ONE 15: e0243696.
24. Olaimat AN, Aolymat I, Elsahoryi N, Shahbaz M, Holley RA (2020) Attitudes, anxiety, and behavioral practices regarding COVID-19 among university students in Jordan: a cross-sectional study. Am J Trop Med Hyg 103: 1177–1183.
25. Al-Rabiaah A, Temsah M, Al-Eyadhy AA (2020) Middle East Respiratory Syndrome-Corona Virus (MERS-CoV) associated stress among medical students at a university teaching hospital in Saudi Arabia. J Infect Public Health 13: 687–691.
26. Prasad Nayak MSD, Narayan KA (2019) Strengths and weakness of online surveys. J Humanit Soc Sci 24: 31–38.

Corresponding author

Jovana Todorovic, MD, PhD
Institute of Social Medicine, Faculty of Medicine, University of Belgrade, Dr Subotica 15, 11000 Belgrade, Serbia
Phone: +381112643830
Fax: +381112659533
Email: jovana.todorovic@med.bg.ac.rs

Conflict of interests: No conflict of interests is declared.