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Analysis of problems related to studying during of the COVID-19 pandemic among dental students – a questionnaire study

Analiza problemów studentów stomatologii związanych ze studiowaniem w czasie pandemii COVID-19 – badania ankietowe

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ABSTRACT

Introduction. In December of 2019 COVID-19 virus has erupted, which led to a global pandemic which scale and severity of health and socioeconomic outcomes was unpredictable. The outbreak of the COVID-19 pandemic affected economic system and had a severe impact on peoples mental health, causing a vast number of negative psychological effects that include depression, confusion, acute stress and anxiety or fear .The COVID-19 pandemic also pose an impact on students and the learning process, predisposing to deterioration of overall well-being, acute stress or development of adverse mental health issues.
Aim. The aim of this study was to present the impact of COVID-19 pandemic on dentistry students.
Material and methods. In this research participated one hundred twenty seven students of the Faculty of Dentistry at the Medical University of Gdańsk, Poland, who volunteered to fulfill an anonymous questionnaire, conduced in years 2021-2022. The questionnaire included seventeen yes or no questions that concerned studying during pandemic of COVID-19.
Results. 42% of participants reported that the interruption of the teaching process was stressful for them and social isolation negatively affected 52,0% of students. The new form of exams od the Moodle platform was stressful only for 35,4% of students, however the majority of students evaluated the lectures on the zoom platform better than the traditional form and would like to maintain the online form of lectures. Negative consequences of the pandemic such as starting or increasing the frequency of tobacco smoking and considering to change the field of study were rarely reported.

Keywords: COVID-19, dental students, remote learning.

STRESZCZENIE

Wstęp. Wirus COVID-19 pojawił się w grudniu 2019 roku, co doprowadziło do globalnej pandemii, której skala i dotkliwość skutków zdrowotnych oraz społeczno-ekonomicznych była nieprzewidywalna. Wybuch pandemii COVID-19 silnie wpłynął na system gospodarczy oraz miał znaczący wpływ na zdrowie psychiczne, powodując ogromną liczbę negatywnych skutków psychologicznych, w tym depresję, dezorientację, stres, niepokój lub strach. Pandemia COVID-19 wpłynęła również na studentów i proces uczenia się, predysponując do pogorszenia ogólnego samopoczucia, dotkliwego stresu lub powstania problemów ze zdrowiem psychicznym.
Cel. Celem pracy było przedstawienie wpływu pandemii COVID-19 na studentów kierunku lekarsko-dentystycznego Gdańskiego Uniwersytetu Medycznego.
Materiał i metody. W badaniach wzięło udział stu dwudziestu siedmiu studentów kierunku lekarsko-dentystycznego Gdańskiego Uniwersytetu Medycznego, którzy dobrowolnie wypełnili anonimową ankietę, przeprowadzoną w latach 2021–2022. Ankieta zawierała siedemnaście pytań tak lub nie, które dotyczyły studiowania w czasie pandemii COVID-19.
Wyniki. 42% uczestników stwierdziło, że przerwanie procesu nauczania było dla nich stresujące, a izolacja społeczna negatywnie dotknęła 52,0% uczniów. Nowa forma egzaminów na platformie Moodle była stresująca tylko dla 35,4% studentów, jednak większość studentów oceniła wykłady na platformie zoom lepiej niż w tradycyjnej formie i chciałaby zachować formę wykładów on-line. Negatywne konsekwencje pandemii, takie jak rozpoczęcie lub zwiększenie częstości palenia tytoniu oraz rozważenie zmiany kierunku studiów, były rzadko zgłaszane.

Słowa kluczowe: COVID-19, studia stomatologiczne, nauka zdalna.

Introduction

In December of 2019 COVID-19 virus has erupted, which led to a global pandemic declared in March 2020 by the World Health Organization (WHO) [1]. The scale and severity of health and socioeconomic outcomes was unpredictable. The number of infections and deaths were spiking despite of uncommon precautionary measures, such as social distancing, isolation, lockdowns or personal protective equipment [2].

SARS-CoV-2 affects human respiratory system and causes mild to severe respiratory distress syndrome [3]. It has been reported that the virus originates from zoonotic source and can be transmitted trough direct contact, contaminated surfaces or droplets during talking or coughing. The most common symptoms include cough, fever, myalgia and severe respiratory failure [4, 5]. Angiotensin-converting enzyme 2, or ACE2 "receptor" is the entry point for the coronavirus to hook into and infect a wide range of human cells which means also the effects of the infection are interdisciplinary and multi-systemic [6]. According to severity of the disease there are mild, moderate and severe symptoms. Mild symptoms present as systematic ones which is body aches, mild fever or coughs. Moderate symptoms can present as a mild pneumonia, while severe ones includes severe pneumonia and hypoxia [7]. The most common effect is range of pulmonary manifestation. There are various of other noted symptoms such as arrhythmias, myocarditis, nausea, vomiting, haematuria and proteinuria, headaches and dizziness [8, 9]. According to multi-systemic and complex symptoms, there is not one specific medication for COVID-19 and treatment is symptomatic [10, 11].

There are two approaches in identifying COVID-19 infection. The first one includes identification of antibodies produced as a result of infection [12]. The antibodies may not be detectable due to low number in mild or asymptomatic cases. The other one identifies virus itself by extracting viruses RNA or antigen in acute phase of an infection [13].

To provide a full picture of the severity of this pandemic situation, either medical effects or psychological impact of COVID-19 should be considered. One of the most exposed to COVID-19 group are healthcare workers, especially doctors, nurses and paramedics who have direct and constant contact with SARS-CoV-2 infected patients [14]. Long-term fear and high stress levels related to responsibility for someone's live can generate disorders such as panic disorder, prolonged grief disorder, generalized anxiety disorder and complex PTSD (post-traumatic stress disorder) [15]. Besides the stress resulting from limited knowledge about the infection, health care providers can experience anxiety caused by a concern about infecting members of their families, longer work hours and probably the most emotionally disorders [16, 17].

The outbreak of the COVID-19 pandemic affected economic system all around the world irrespectively of the geographic location or richness. A severe negative impact on socio-economic sectors including health, education, religion and tourism was observed [18, 19]. Majority of households experienced a drastic drop in income and faced financial difficulties [20]. Complicated financial situation in addition to variety of austerity measures had a severe impact on peoples mental health, causing a vast number of negative psychological effects that include depression, confusion, acute stress and anxiety or fear [21].

The COVID-19 pandemic also pose an impact on students and the learning process, predisposing to deterioration of overall well-being, acute stress or development of adverse mental health issues [22].

The aim of this study was to present the impact of COVID-19 pandemic on dentistry students.

Material and methods

In this research participated one hundred twenty seven students of the Faculty of Dentistry at the Medical University of Gdańsk, Poland (N = 127), who volunteered to fulfill an anonymous questionnaire. The study population included ninety fife female (N = 95) and thirty two male (N = 32), among which there were sixty six third year students (N = 66), fifty four fourth year students (N = 54) and seven fifth year students students (N = 7). The questionnaire was conducted in years 2021–2022 by dentistry students who volunteered to participate in the project.

Two screening questions were used to determine survey eligibility and these questions inquired gender and the year of dentistry studies. The questionnaire included seventeen yes or no questions that concerned studying duringthe pandemic of COVID-19. The first two questions inquired aboutcaused by disruption of the teaching process and social isolation. The next nine questions concerned about the remote teaching and examination procedures, contact with lecturers and limitations of computer access. The next four questions inquired about fear of classes resumption, direct contact with peers during the pandemic, willingness to continue remote learning and having remote learning siblings. The last two questions concerned

about the consequences of pandemic such as starting or increasing the frequency of tobacco smoking and considering to change the field of study.

The statistical analysis was performed using the statistical suite StatSoft Inc. (Tulsa, OK, USA) (2014), STATISTICA (data analysis software system) version 12.0. from www. statsoft.com, accessed on 9 May 2014 (2014) and Excel. The significance of the difference between two groups was assessed with the chi-square test ($p < 0,05$).

The study protocol has been approved by the Ethics Committee of Medical University of Gdansk, Poland (NKBBN/424-4/2022). Ethical aspects of the research followed the World Medical Association Declaration of Helsinki.

Results

Out of a population of one hundred twenty seven students who participated in the research, 42,5% reported that the interruption of the teaching process was stressful for them and social isolation negatively affected 52,0% of students, reported that the interruption of the teaching process was stressful for them and social isolation negatively affected 52,0% of students, although 76,4% reported a direct contact with peers during the pandemic. The new form of exams od the Moodle platform was stressful only for 35,4% of students, however 51,1% of participants reported the interruption of the connection and 11,0% missed the connection during the exam. The majority of students (89,0%)

Table 1. The questionnaire with percentage of received answers

Tabela 1. *Kwestionariusz otrzymanych odpowiedzi wyrażonych w procentach*

Questions	Yes	No	P-value
1. Was the interruption the teaching process due to a COVID-19 pandemic stressful for you?	42,5% F: 45,3%, M: 34%	57,5% F: 54,7%, M: 66%	0.2812
2. Did social isolation negatively affect you?	52,0% F: 54,7%, M: 44,5%	48,0% F: 45,3%, M: 55,5%	0.2820
3. Were the new forms of exams on the Moodle or other platform an additional stress for you?	35,4% F: 38,9%, M: 25,0%	64,6% F: 61,1%, M: 75%	0.1537
4. Was the connection ever interrupted during the exam?	51,1% F: 57,9%, M: 31,3%	48,9% F: 42,1%, M: 68,7%	0.0091*
5. Do you evaluate the lectures on the zoom platform better than in the traditional form?	89,8% F: 93,7%, M: 78,1%	10,2% F: 6,3%, M: 21,9%	0.0120*
6. Do you evaluate the oral exam on the zoom platform better than in the traditional form?	48,0% F: 51,6%, M: 37,5%	52,0% F: 48,4%, M: 62,5%	0.1680
7. Was contact with the lecturers by e-mail or at zoom platform sufficient for you?	81,9% F: 82,1%, M: 81,2%	18,1% F: 17,9%, M: 18,8%	0.9135
8. Would you prefer lectures on the zoom platform in the future?	97,6% F: 97,9%, M: 96,9%	2,4% F: 2,1%, M: 3,1%	0.7425
9. Have you ever missed a connection while taking an exam?	11,0% F: 8,4%, M:18,8%	89,0% F: 91,6%, M: 81,2%	0.1066
10. Did you have unlimited access to a computer at your place of residence?	88,2% F: 87,4%, M: 90,6%	11,8% F: 12,6%, M: 9,4%	0.6215
11. Did you have unlimited access to the webcam at your place of residence?	81,9% F: 80,0%, M: 87,5%	18,1% F: 20,0%, M: 12,5%	0.3407
12. Were you afraid of going back to traditional classes?	27,6% F: 29,5%, M: 21,9%	72,4% F: 70,5%, M: 78,1%	0.4054
13. Did you have a direct contact with peers during the pandemic?	76,4% F: 72,6%, M: 87,5%	23,6% F: 27,4%, M: 12,5%	0.0868
14. Do you think that e-learning classes should account for a greater proportion of all classes in future?	58,2% F: 55,8%, M: 65,6%	41,7% F: 44,2%, M: 34,4%	0.3291
15. Do you have siblings who studied remotely during the pandemic?	50,4% F: 45,3%, M: 65,6%	49,6% F: 54,7%, M: 34,4%	0.0463*
16. Did you start or increased tobacco smoking during the pandemic?	7,1% F: 5,3%, M: 12,5%	92,9% F: 94,7%, M: 87,5%	0.1676
17. Did you consider to change the field of study because of the pandemic?	5,5% F: 5,3%, M: 6,3%	94,4% F: 94,7%, M: 93,7%	0.8325

Legend: F – female, M – male, * statistical significance ($p < 0.05$)

evaluated the lectures on the zoom platform better than the traditional form and 97,6% would like to maintain the online form of lectures, therefore oral exams were evaluated better by 48,0% of students and 58,2% would like more e-learning classes in future. Contact with the lecturers by e-mail and zoom platform was sufficient for 81,9% of participants. The majority of students had unlimited access to computer (88,2%) and webcam (81,9%) at their place of residence. The fear of classes resumption was reported by 27,6% of participants. There were rarely reported negative consequences of the pandemic such as starting or increasing the frequency of tobacco smoking (7,1%) and considering to change the field of study (5,5%).

Statistically significant differences between male and female were observed in the interruption of the connection during the exam, evaluate the lectures on the zoom platform better than in the traditional form and having siblings who studied remotely during the pandemic.

The obtained results are presented in **Table 1**.

Discussion

It has been shown that global events such as the coronavirus pandemic can have a potential negative impact on the mental health of various social groups, including university students. This influence manifests itself as anxiety, depression and fear, among others, which is reflected in the research results. Cao et al. report that 24.9% of the surveyed students felt anxious about the outbreak of the COVID-19 pandemic [23]. On the other hand, in study conducted by O'Byrne et al., as many as 54.5% of respondents reported moderate to destructive stress [24]. The COVID-19 pandemic has affected all areas of social life, including the interruption of the traditional training of students especially young doctors and dentists [25]. As many as half of the respondents (50.4%) had siblings who also switched to remote education. This change forced a significant reduction in interactions between students, which had an impact on their mental health, leading, among others, to an increased level of stress [26]. The negative impact of separation from other students on the well-being and mental balance of the individual has been proven [27]. The research conducted by Romic et al., during which students were to compare the level of anxiety experienced in 2020 and 2019 showed alarming results. 66.7% of respondents reported an increase in the sense of anxiety in 2020 compared to the previous year [28]. Also in the study conducted by Elmer et al., the surveyed students reported that in April 2020 they felt more anxiety, stress and loneliness compared to September 2019 [29]. Lyons et al. show that the changes associated with the transition to e-learning and the reduction in the intensity of meetings with peers could lead to negative consequences for the mental health of students [28]. Among the negative effects of the pandemic reported by the respondents, the negative impact on social contacts and increased stress levels prevailed [28]. The aforementioned study confirms that living in the era of the coronavirus pandemic exposes students to additional and constant stress, furthermore leading to the deterioration of mental health among 2/3 of the respondents [28]. On the contrary, the study by Lyons et al. draws attention to a surprising issue related to the positive impact of the pandemic on the lives of students. Respondents reported that during the pandemic there was an improvement in their relationship with family members and it had a positive impact on physical activity and sleep [30]. The transition to remote learning brought up many challenges related to both technical problems and problems resulting from staying in social isolation. Students, considered one of the most active social groups [30], had to adapt to the new reality, where they saw their classmates mainly on the monitor screen. The above factors led to an increase in stress levels and the incidence of mental health problems, for example, among Egyptian students, who developed symptoms related to depression and anxiety in 70.5; 53.6 and 47.8% of the respondents [31]. Among students of Gdansk Medical University, the interruption of the education process led to stress in 42.5% of the respondents. In more than half of the surveyed students (52%), isolation from peers was a factor negatively affecting their well-being.

The study also included a connection between staying in the pandemic reality and increasing the level of tobacco smoking or starting the habit. The results showed a positive correlation between the above-mentioned factors in only 7.2%, which was confirmed, for example, in the research of Nguyen et al. Here, only 3.1% of respondents reported that the COVID-19 pandemic contributed to an increase or a constant number of cigarettes smoked per day [32]. However, this results differ from the data provided by Gritsenko et al., where increased use of stimulants, including tobacco, was noted among the surveyed university students [10].

In the questionnaire, the respondents were also asked to answer the question about their feelings about returning to the university and education in

the traditional form. Surprisingly, the vast majority of them (72.4%) did not feel stress related to returning to the university. This is in contrast to data provided by Masha'al et al., which showed that the majority of surveyed nursing students perceived resuming residential teaching as stressful [32]. Despite the difficulties students had to face during the pandemic, the vast majority of them remained faithful to their professional choices and did not consider changing their field of study. This tendency was also observed among students from other continents. Researchers noted that among Libyan students, only 33.7% of them declared the impact of the coronavirus pandemic on their current or future career plans [25]. The results of another survey conducted among students of Croatian universities were identical to those mentioned above, as many as 82.6% of respondents did not think about giving up studying at a medical university during the pandemic [26].

The sudden and unexpected universities' facilities closure and switching from a face-to-face form of study to online learning posed a challenge not only for academics, but also for students [33, 34]. Nevertheless, some universities, after an intense lock-down period, have decided to continue to maintain part of their education in the online formula, which may be questionable due to the imperfect form of education during the pandemic [35]. On the other hand, it is anticipated that blended learning would have an important place in the future of dental education [36].

Concerns about online education largely covered technical issues, such as access to a computer and webcam and a stable Internet connection [37, 38]. 51% of the students surveyed reported interrupted Internet connection while attending online classes which is similar to the results from Lestari et al. study [39]. However only 11% had to deal with missed connection during exams. Interestingly, lack of the unlimited access to the computer which was reported by 11,8% students from our study could be solved with the usage of mobile phones, because according to Sarıalioğlu Güngör et al. due to the popularity of smartphones and iPad/computer tablets among students, mobile learning is a developing trend in dental education. Therefore the need of having computer to connect to the Internet is less than before [37].

Students strongly favor continuation of online learning regarding lectures, nearly 90% of surveyed people claimed that lectures on the zoom platform were better than in the traditional form. However slightly more than half of the students (58,2%) believe that the remaining classes (all except lectures) should be in an online formula. The similar point of view was observed in students from Justus-Liebig-University Giessen (Germany) [40], Iuliu Hatieganu University (Romania) [41] and Faculty of Dentistry Universitas Indonesia, where only 44.2% students preferred distance learning over classroom learning [33]. In a survey conducted by Hayes et al. dental students agreed that online lectures cannot completely replace live ones [42], on the contrary to study performed by Vražić et al., where the vast majority of students concurred that lectures and seminars could be held online [43]. Most of students prefer combining online learning and traditional classroom one [38].

Online exams were also an important issue evaluated among students. For 35,4% of polled students exams on online platforms were an additional stressor and the greater half of them says that oral exams are not better in an online form comparing to traditional face-to-face one. According to Ramanarayanan et al. students may have felt nervous and stressed because in most cases, to ensure the integrity of the exam, students were constantly watched by examiners using cameras. Therefore, any technical malfunction could have posed a risk of failing the exam [44].

Remote learning also brings increased difficulty to stay in contact with academic teachers as a problem [33, 45]. From the perspective of most of students surveyed in this study, communication with instructors was sufficient, which was claimed by 81,9% of them. Nevertheless, due to the subjective evaluation of the quality of interaction with teachers, it must be taken into consideration that this can be a problem in long-term distance learning, as Amir et al. noted [33].

Conclusion

Further studies involving a larger sample of students from dental faculties in Poland are required to ensure generalizability of the findings and the long-term effects of remote learning among students, as well as appropriateness of implementing remote learning for the education of future dentists.

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Conflict of interest statement
The authors declare no conflict of interest.

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