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THE POST-PANDEMIC IMPACT OF COVID-19 ON DENTAL EDUCATION IN CLUJ-NAPOCA COUNTY, ROMANIA

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ABSTRACT

Aim of the study The aim of this study was to evaluate the impact of the pandemic on dentistry education in Cluj-Napoca County, Romania, by studying the post-pandemic effect upon medical education and lifestyle changes of dentistry students. **Material and methods** We conducted an experimental study aimed at associating some of the factors related to post-pandemic situation in dental students: stress, social status, the way the COVID 19 affected study type and characteristics or clinical practice, lifestyle changes, if social life or way of thinking has changed after the pandemic. A self-developed questionnaire, in English language, with no private identifiable information was used. Participation was voluntary, answers were anonymous. Statistical analysis was performed using the MedCalc version 20.110 software. **Results** A number of 131 participants with ages ranging between 20 to 40 years (mean age=24.2±2.9) completed the questionnaire. There were participants from France, Germany, Greece, Hungary, Iran, Israel, Italy, Norway, Romania, Syria, Tunisia, United Kingdom, USA. There was an impact of COVID upon studies, the following issues being reported: less practice, social distancing, lack of patients, online classes instead of on-site ones, missing practical activities, procrastination increase, time for study but lack of time to practice the theoretical issues, no hands-on experience, stress and panic, burnout, afraid of a potential infection in classes after the pandemic. **Conclusions:** The COVID-19 pandemic did influence dental students' studies; studying dentistry and dental technology online is challenging; lifestyle changes have been noticed in the post-pandemic period.

Key words: post-pandemic impact, dental education, students, lifestyle changes, COVID-19

INTRODUCTION

The coronavirus outbreak has prompted organizations and individuals to implement emergency lockdown plans, which affected academic and medical education [1]. According to UNESCO, two-thirds of an educational year has been sacrificed attributable to temporary or permanent shutdown around the world [2]. Dentistry is a practical profession; therefore, students must gain practical skills to perform unprejudiced clinical procedures. Several professional concerns, such as biomechanical, ergonomic, and work-related issues, are known to exist in dentistry [3], [4]. In comparison to live demonstration alone, e-learning enhances the experience and skills acquisition of undergraduate dentistry students [5]. COVID-19 modified dentistry education, encouraging academics to work on new technologies and learning strategies [6]. Telemedicine is fundamentally transforming the way healthcare is delivered as a consequence of recent technological advancements [7].

The aim of this study was to evaluate the impact of the pandemic on dentistry education in Cluj-Napoca County, Romania, by studying the post-pandemic effect upon medical education and lifestyle changes of

dentistry students.

MATERIAL AND METHODS

The study was conducted at the Faculty of Dental Medicine, Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania. We conducted an experimental study aimed at associating some of the factors related to post-pandemic situation in dental students: stress, social status, the way the COVID 19 affected study type and characteristics or clinical practice, lifestyle changes, if social life or way of thinking has changed after the pandemic.

A self-developed questionnaire, in English language, with no private identifiable information was used, which was delivered for completion to dental students, between 23 May 2022 - 27 May 2022. Participation was voluntary, answers were anonymous. Data collection method was based on group sampling. This was a cross-sectional survey, with every member completing the questionnaire just once. A methodological original questionnaire, comprising thirty questions, was used to collect data for this investigation (Table 1). The first part of the questionnaire comprised demographic information (age, gender, year of study, home country, social status, children, area of living). The following part contained questions related to the COVID-19 pandemic and relationship to studies: in what way it affected studies, practical work in classes, courses, online courses, and practical activities compared to on-site courses and practical work. The final part of the questionnaire assessed the social life, hobbies, spending habits, way of thinking, psyche, and issues that may have changed in the post-pandemic era.

Table 1. Original questionnaire used for data collection

Post COVID 19 Survey	
Nr.	**Question**
1	My age is:
2	My gender is:
3	I am student of … year …
4	My home country is:
5	Social status:
6	Do you have children?
7	Do you live in rural or urban area?
8	Did the COVID pandemic affect your studies?
9	If yes, in what way?
10	In what way did de COVID affect your practical work in classes?
11	In what way did de COVID affect your courses?
12	Did the way of study change after the pandemic?
13	If yes, in what way?
14	Do you enjoy online courses?
15	Describe the impressions about online courses:
16	Do you enjoy online practical labs?
17	Describe the online labs, advantages or disadvantages compared to on site labs:
18	Did your social life change after COVID 19 pandemic?
19	If your social life has changed, in what way did it?
20	Where do you study?
21	Has your way of thinking changed after the pandemic?
22	Describe your hobbies:
23	Did your hobbies change after the pandemic?
24	If your hobbies have changed, in what way?
25	Have you changed the way of spending money after the pandemic?
26	If you have changed your spending habits, in what way?
27	Did the pandemic influence your psyche?
28	Are you in the post COVID 19 era more anxious?
29	Are you in the post COVID 19 era more depressed?
30	What is the biggest issue that has changed due to COVID 19 in your life?

The questionnaire was distributed using the Microsoft Teams platform [8], to be completed online using "Google forms," a free Google tool. Data was subsequently incorporated into an Excel spreadsheet [9] to define data representations and analyses.

Inclusion criteria were as follows: study participants were selected as being Dental Medicine students of the IVth, Vth and V^{Ith} years of study and Dental Technology students from the IInd and IIIrd years of study, of the "Iuliu Haţieganu" University of Medicine and Pharmacy. Exclusion criteria: students from other faculties, dental

practitioners, incomplete data filling, students who did not fill in the questionnaire due to ethical reasons, although all were anonymous.

Statistical analysis was performed using the MedCalc version 20.110 software [10]. To determine the relationship between the questions and any association with year of study, area of provenience and gender, Chi-square tests and the Fisher Exact Test were used. The test results were rated significant at a p value below 0.05.

RESULTS AND DISCUSSIONS

The questionnaire was completed by 131 participants ranging in age between 20 to 40 years old (mean age=24.2±2.9). There were 66 students in years 2-4 and 65 in years 5-6 of study. The ratio female/male was 82/49. There were participants from France (n=31), from Germany (n=21), Greece (n=2), Hungary (n=1), Iran (n=3), Israel (n=1), Italy (n=4), Luxembourg (n=1), Maroc (n=1), Netherlands (n=1), Norway (n=1), Reunion (n=1), Romania (n=53), Spain (n=1), Syria (n=2), Tunisia (n=4), United Kingdom (n=1), USA (n=2). Table 2 shows the relationship between several investigated parameters, study year, and gender. The majority of respondents were single (n=151) whereas 26 were in a relationship or married. The majority of students did not have children (n=127).

COVID had an impact on the studies (Table 3), based on the observed issues: less practice, social distancing, lack of patients, online classes instead of on-site ones, missing practical activities, procrastination increase, time for study but lack of time to practice the theoretical issues, no hands-on experience, stress and panic, burnout, afraid of a potential infection in classes after the pandemic. COVID's influence on studies had the following effects on practical activity in classes: very much (n=64; 48.85%), much (n=45; 34.35%), little (n=21; 16.03%), very little (n=1). COVID's influence on courses was enhanced in the following ways: very much (n=28; 21.37%), much (n=38; 29%), little (n=41; 31.29%), very little (n=9; 6.8%), not at all (n=15; 11.45%). Following the pandemic, there was a change in the way people studied: practical capacity to work decreased significantly, students were more focused, lost the rhythm of going to each class, were more cautious, needed to recap a lot, were more focused during the courses, during online classes it was difficult to study and listen to teachers. It was difficult to return to onsite classes due to a better understanding of online classes; online classes contributed to improving students' ways of thinking and learning; students began to use the computer for studying rather than books. Students were fearful of the virus, and masks and immunization checks were a source of anxiety.

Online courses were enjoyed by 64.12% respondents, the majority pointed that: it was difficult to pay attention online and sit in front of the computer for the entire day, forcing pupils to stay at home. Lectures were impersonal, not interchangeable with face-to-face activities, students needed more time to study, and multimedia have been used, which were such an innovative contribution to the old style of presenting lectures. It was difficult to interact with the educators because to the distance, and it was difficult to understand the students' queries or answers due to technical issues. Students had more time since they were able to attend courses more readily and not have to rush from one class to the next; it was also easier to listen to the educator and see the writing on the presentations; but the teacher's body language was lacking. Many students lost their attention very easily, some reported focusing better alone at home while no one is disturbing than in a full amphitheatre, many have missed face-to-face interactions with

colleagues and professors. Some subjects were explained too rapidly, and the lecturer was unaware of the students' level of comprehension. Many students mentioned a lack of motivation to keep up, a loss of a genuine desire to study, internet connection issues, a lack of concentration, and a lack of enthusiasm.

Nevertheless, students reported also positive aspects: online teaching provided better viewing of explained images than in the auditorium, and the sound was better, good technology that can be followed, ease of attention, passive engagement with the teacher, educative and easier to access, sometimes difficult for the professor, but comfortable for students.

Online was a nice environment to be at, it was less time consuming, and recording the courses aided in studying. Students did not consider online learning as a substitute for face-to-face clinical teaching and practical facilities.

Table 2. Relationship between different parameters related to year of study and gender

Characteristics	**Year of study (n)**			**Gender (n)**		
	year 2-4	year 5-6	p value	female	male	p value
	yes	no		yes	no	
Did the COVID pandemic affect your studies?						
yes	58	8	0.31	69	42	0.80
no	53	12		13	7	
Do you enjoy online practical labs?						
yes	8	3	0.12	6	5	0.56
no	58	62		76	44	
Do you enjoy online courses?						
yes	36	30	0.02	58	26	0.04
no	48	17		24	23	
Did the way of study change after the pandemic?						
yes	42	34	0.19	47	29	0.83
no	24	31		35	20	
Did your social life change after COVID 19 pandemic?						
yes	42	40	0.80	54	28	0.32
no	24	25		28	21	
Has your way of thinking changes after the pandemic?						
yes	42	50	0.09	65	27	0.0035
no	24	15		17	22	
Did your hobbies change after the pandemic?						
yes	22	13	0.08	20	15	0.43
no	44	52		62	34	
Have you changed your spending habits after the pandemic?						
yes	28	29	0.80	41	16	0.05
no	38	36		41	33	
Are you in the post COVID 19 era more anxious?						
yes	26	33	0.19	41	18	0.14
no	40	32		41	31	
Are you in the post COVID 19 era more depressed?						
yes	26	25	0.91	38	13	0.02
no	40	40		44	36	

n=number of cases

Table 3. Impact of COVID-19 on different characteristics (n=number of cases, RR=relative risk; OR=odds ratio)

Impact of COVID-19 of studies' change								
Social life change	no (n)	yes (n)	chi-square	p value	RR	p value	OR	p value
no (n)	11	38	3.09	0.07	1.14	0.10	2.34	0.08
yes (n)	9	73						
Anxiousness								
no (n)	16	56	5.93	0.01	1.19	0.01	3.92	0.02
yes (n)	4	55						
Depression								
no (n)	17	63	5.64	0.01	1.19	0.0086	4.31	0.02
yes (n)	3	48						
Psyche								
no (n)	12	34	6.36	0.01	1.22	0.03	3.39	0.01
yes (n)	8	77						
Way of study								
no (n)	14	41	7.54	0.0060	1.23	0.01	3.98	0.0086
yes (n)	6	70						
Enjoy online courses								
no (n)	4	43	2.56	0.1	0.88	0.07	0.39	0.11
yes (n)	16	68						
Enjoy practical labs online								
no (n)	18	102	0.07	0.77	0.96	0.79	0.79	0.77
yes (n)	2	9						
Hobbies								
no (n)	17	79	1.64	0.20	1.11	0.13	2.29	0.20
yes (n)	3	32						
Way of thinking								
no (n)	12	27	10.23	0.0014	1.31	0.01	4.66	0.002
yes (n)	8	84						
Spending money								
no (n)	13	61	0.69	0.40	1.06	0.39	1.52	0.40
yes (n)	7	50						
Courses								
very little (n)	1	8	12.56	0.01				
little (n)	6	35						
not at all (n)	6	9						
much (n)	7	31						
very much (n)	0	28						
Practical work								
very little (n)	1	0	22.083	0.0001				
little (n)	8	13						
much (n)	9	36						
very much (n)	2	62						

Following the COVID-19 pandemic, social life has changed: students reported more appreciation for things (since you do not know of you will be there tomorrow), some students grew more irritable and depressed, becoming more introverted; many reported less social engagement, the loss of

friends, and a decrease in their quality of life. Some students became more isolated, grouped in smaller circles, and reported that it was extremely difficult to meet new people and have fun.

Individuals became more unmotivated, developed a negative mindset, and were no longer as openminded or spontaneous. They were more anxious while interacting with others, and they encountered serious limitations: masks, tests, immunization,

loneliness, contamination stress, and psychological laxity.

The majority of respondents studied at home (83.96%).

In 72.22 percent of the students, their thinking altered as a result of the pandemic.

Hobbies did not alter significantly after the pandemic (73.28%); however the following issues were reported: during the lockdown, students were unable to go out in nature, meet up with friends, or go out; sports was conducted in private rather than in groups; and outdoor activities were restricted, decreasing mental wellbeing. Some students adopted activities that focused more on the soul, such as yoga and meditation, in addition to improving their reading.

Spending habits did not change too much. However, following the pandemic, everything became more expensive, and several students reported purchasing more clothes and not spending any money on travel or going out.

As they were afraid of missing out on events in their student lives or that life could change suddenly, the majority of respondents were more cautious, but some spent more money. Students learned to budget their money, did most of their shopping online, and many spent more on extracurricular activities than on needs.

COVID-19 did have an influence upon psyche: 64.88%, some become more anxious (45.03%) and others more depressed (38.93%).

The most significant change in students' lives as a result of COVID 19 was beginning to value time more highly, and many began to focus more on individual values, attempting to make experiences as memorable as possible in order to preserve positive memories while society continued to run smoothly. Some said they were able to enjoy parties and travel more, while others said they learned to respect family more. The majority of people said they understood life is unpredictable, while others said they changed their view on life and developed confidence.

Many students emphasized the rising importance of disinfection and hygiene procedures.

Students began to prioritize social life and financial condition, and they began to pay more attention to both mental and physical health.

Students became more disappointed and anxious because of the negative impact, which also included uncertainty about their future as dentists, missing out on the best memories they may have had, and adopting a negative outlook as a result of all the constraints.

A decline in social life, a higher level of social anxiety, hypertension, stress, fear issues, anxiety and stress, less trust in others, less confidence in working and dealing with patients, and becoming more reserved when approaching people, have also been pointed.

It has been reported that COVID-19's impact on medical education is still unclear, therefore efforts must be carried out to ensure for any possible outcome [1].

We have found out that anxiety may become more prevalent as a physiological response to risk as a result of a persistent sense of insecurity or excessive fear, as well as it has also been suggested by Cayo-Rojas CF et al., particularly in the periods of COVID-19 pandemic [11].

Dental practice has changed in the post-pandemic period, the precautions taken appear to be beneficial in ensuring a safe dental environment for patients, oral health care professionals [12] and students. Dental education has suffered because of online learning, which cannot replace the traditional face-to-face teaching [13], as it has also been suggested by the students who filled in this questionnaire.

Dental education is being confronted with major difficulties, several of which never

noticed before the pandemic [14]. A study showed that students had a positive attitude towards online learning and expressed satisfaction with the modifications in the learning format; nonetheless, some difficulties were observed [15], like difficulties to pay attention to online lectures that were impersonal, not exchangeable with face-to-face activities, some courses were informative and interactive, there was lack of body language form the teacher, some subjects were explained too quickly, too fast, and the lecturer couldn't realise the level of understanding the students had, many students reported less motivation to keep up, internet problems, less concentration and less motivation.

Students and teachers should follow new policies and procedures upon returning to the dental office or courses after the pandemic [16] in order to re-establish a balance.

It is really important to focus as well on mental health; a study showed that a considerable number of dental students and practitioners suffer from depression; therefore it is critical to assess and manage their mental health [17]; a psychosocial support program for students should be implemented [18]. The pandemic had a negative impact on students' social lives [19], as well as negative consequences on students' entire well-being [20].

Students' opinions towards curriculum changes propose practical courses and lectures as a means of overcoming COVID-19 uncertainties [21].

The benefits and drawbacks of distant learning should be considered by universities for achieving better educational experiences and provide a sound professional formation for dentistry students [22]. In the dental education profile, innovative combined teaching approaches and e-learning platforms are available, which play a significant role in student education [23]. Hasanzade et al., stated that restarting schools after the COVID-19 pandemic appeared intriguing [24], which we also emphasize.

This article focuses on how to react as a teacher and a student if similar scenarios arise in the future; online courses should be less frequent than weekly, have fewer students, and be more student-centred. Students may benefit from psychology classes or even consultations with a psychologist to help them get through this challenging period.

CONCLUSIONS

1. The COVID-19 pandemic did influence dental students' studies.
2. The main issues reported by students were home isolation, away from the academic environment, lack of practice, lack of patient contact, no hands-on experience of the theoretical knowledge.
3. Studying dentistry and dental technology online poses many difficult challenges; practical work in dental offices has been more affected than online courses.
4. Lifestyle changes have been noticed in the post-pandemic period, isolation, depression, and anxiety being mostly reported.

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