Original Research

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Romanian dental students' learning experience related to lifestyle changes imposed by Covid-19 lockdown

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Abstract

Background and aim. The SARS-CoV-2 outbreak in Romania was followed by the declaration of an Emergency State and the subsequent lockdown. As all the schools and universities ceased onsite activities, the teaching process continued exclusively online, on different platforms, such as Microsoft Teams or Zoom.

Objectives. The aim of this cross-sectional study is to evaluate how the lifestyle changes imposed by the Covid-19 lockdown and online lectures influenced the learning experience of Romanian dental students, as their point of view could bring new information which might contribute to improving the teaching process.

Methods. The questionnaire had 28 items, each with either a Likert Scale or a multiple-choice option and was distributed in April 2020, one month after implementation of circulation restrictions and social distancing.

Results. Compared to classical teaching, we found that the online teaching process had a lower efficiency, with a higher satisfaction level for online courses, but lower for online practical teaching activities. The absence of human interaction was found to be detrimental to the teaching process.

Conclusion. Despite the lower efficiency of online learning, it was a good alternative that helped students continue their education in the situation created by the outbreak of Covid-19. For higher learning efficiency, a compromise method consisting of online courses and onsite practical training could be a better alternative.

Keywords: Covid-19, state of emergency, lockdown, dental students, online teaching

Background and aim

The SARS-CoV-2 outbreak of the beginning of the year 2020 was officially declared a pandemic by the World Health Organization on March 11th [1]. As a result, many governments, including the Romanian [2], implemented mobility and social restrictions (social distancing, cancelling of social events) in order to reduce the COVID-19 spread [3].

In Romania, the state of emergency was declared on March 18th 2020 and was maintained until May 18th 2020, being followed by State of alert [4]. During the Emergency State, free circulation was heavily restricted, leaving the residence being permitted only for vital needs or professional duties, with a self-signed declaration indicating the reason for leaving. Also, the teaching process was carried out only online for both pre-university and university courses [2].

In medical schools worldwide, online learning was defined by holding the theoretical and practical courses solely via online communication platforms (i.e. Microsoft Teams, Zoom, Google Meet). Sudden as it may have been, online learning was successfully implemented in universities around the world, not as a singular method, but as part of a hybrid method, using both traditional and online methods [5,6]. Moreover, there are studies that suggest some online teaching methods

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seem to even improve the student's performance compared to traditional teaching methods, in the case of medical students [7-10].

As with traditional teaching, online teaching and the online learning environment presents both advantages and limitations. The advantages cited are: the capacity of the e-learning platform to analyze data of how and when the learning happens, increased student access to information through mobile devices, the capacity of e-platforms to dynamically adjust to the student's needs, and increased communication between students and teachers [11-13]. Limitations of online learning could be attributed to lack of interpersonal communication [14], technical demands or necessary devices [15], poor internet quality [16], or even time flexibility, for students who struggle with task management [15].

Because of the COVID-19 pandemic, all schools and universities switched to exclusively online learning methods. For many Dental Schools, this virtualization process is an ongoing progress, albeit it was abruptly imposed, but this may be an opportunity to move forward in a teaching/learning experience [17].

For the Dental School, exclusive online education means the complete cancellation of clinical training, which is of paramount importance for a young dental student in both skill acquisition and relationship building [18]. Because of the lack of practical work during COVID-19 pandemic, students had reservations about independent practice following graduation [19]. Prolonged implementation of mobility restrictions and the lack of practice of dentistry could affect the students' academic performance and have a debilitating effect on their mental health [20]. For the second wave of the COVID-19 pandemic new teaching methods were developed for dental clinical training in order to re-enter the normal rhythm of clinical training [21].

Pandemic-related restrictions may lead to changes in daily routine regarding the outdoor activity, sleeping patterns, social activities, affecting the mental well-being of the students [22]. All of these combined with the fact that students experienced for the first time an exclusive online education led to major changes in the students' behavior and learning efficiency. Their point of view could bring unprecedented information about the advantages and disadvantages of online learning compared to classical learning.

Romanian dental students were generally satisfied with online lectures, while a small percentage of them believe that online practical activities are more useful than traditional ones [23]. According to our knowledge, no studies assessed how aspects such as daily habits, comfort, human interaction and online lectures changed the learning experience of dental students during the Covid-19 lockdown.

The aim of this study was to evaluate how the lifestyle changes imposed by Covid-19 lockdown and online lectures influenced the learning experience of Romanian dental students.

Methods

This cross-sectional study was conducted using a web-based Google Forms survey distributed via our university intranet to all the students from the Romanian Dental Medicine Section (600 students). The survey was opened for completion from 15th April to 27th April 2020. Participants were voluntarily involved in this study and informed consent was obtained from each of them. All participants were informed that no personal data was collected and agreed to complete the survey anonymously.

Questionnaire design

A preliminary questionnaire consisting of 22 Likert scale questions, where 5 represented strong agreement and 1 represented strong disagreement and 6 multiple choice questions regarding demographics and technical support was designed by 4 dentists who teach at our university, one psychologist, one expert in social sciences and a statistician. Face validity and content validity of the questionnaire were assessed by pilot testing it on a group of 15 students.

For ease of completion and data sorting, the questionnaire was designed in 4 parts as demonstrated in table I.

In the first part, Demographics data were collected through open answers. The Technical Support data were collected through multiple choice questions and for the following two categories of questions, questions used a Likert scale with a scoring system from 1 to 5, where 5 represented strong agreement and 1 represented strong disagreement.

Objectives

The objective of this study was to assess how lifestyle changes imposed by Covid-19 lockdown and online learning influenced the learning experience of Romanian dental students.

Table I. Questionnaire design.

Classification of questions	Content of questions
Demographics	Place of self-isolation, home sharing, age, gender, year of study
Technical Support	Device used to connect
Impact of isolation on the learning process	Concentration, learning ability, course attendance
Evaluation of online learning process	Satisfaction with online courses, communication, social interaction

Statistical analysis

We used the Cronbach's alpha test to assess the reliability of the questionnaire data. The statistical analysis was performed with an online Statistical Package for the Social Sciences Statistic, using the Two Tailed Single Sample Student T test (https://www.socscistatistics.com/tests/tsinglesample/default2.aspx [accessed 10th May 2020]). We set the median value -3- as a neutral reference and we used it to compare the overall results from the questions. We also used the Two Tailed Single Sample Student T test to compare the average score form a group of respondents to the average score for that question, for determining which kind of interaction was preferred by students during the online courses - Audio or Video and the level of satisfaction associated with online courses and online clinical training.

Results

Reliability test

The Cronbach's alpha coefficient yielded a value of 0.759, indicating high internal reliability of the questions.

Demographic data and technical support of the students who completed the survey

Our questionnaire had 213 respondents, students ranging from first to sixth year of study, the majority of whom were females n=171 (80.2%). The most frequently used device for connecting to the Online Platform was the laptop (n=164, 76.9%). The answers indicated that most of the students attended online courses from their hometown (n=180, 84.5%), most of them living with the family (n=175, 82.1%).

Regarding the impact of traffic restrictions and social distancing on the students' ability to concentrate during online lectures, when analyzing the results for participants that used the PC as the main device for online learning (average score for PC users = 2.33) to the average score for this question (2.98), using the Single Sample T test, the results were statistically significant (p=0.035).

There were no statistical difference between students from different years of study or gender in any of the items in our questionnaire.

Table II. Isolation impact on the learning process.

Nr. Crt.	Question	Average score
1	Restrictions of free circulation and social distancing had an impact on my concentration during online courses	2.98 (p=0.88)
2	I would have participated just as often to online courses if free circulation had not been restricted during the emergency state	3.81 (p<0.0001)
3	My attendance to online courses compared to classical courses was better	3.57 (p<0.0001)
4	Self-isolation overall improved the efficiency of my learning process	2.34 (p<0.0001)

Table III. Isolation impact on the learning process.

Nr. Crt.	Question	Average score
1	Online teaching had the same learning efficiency as the classical teaching	2.17 (p<0.0001)
2	Online practical training was less efficient by at least 50% than the classical practical training	3.82 (p<0.0001)
3	I consider online courses to be a good alternative to classical teaching courses	3.46 (p<0.0001)
4	My concentration was improved during online courses compared to the classical ones	2.86 (p=0.19)
5	My concentration during online courses was influenced by the setting in which I attended to the course (home/garden; alone/with family etc.)	4 (p<0.0001)
6	I was more easily distracted by other activities during online courses compared to classical courses	3.43 (p<0.0001)
7	While attending online courses I frequently performed secondary activities like cooking, cleaning, watching TV etc.	2.44 (p<0.0001)
8	I did not attend online lectures, since I prefer watching them recorded, whenever I see fit	1.85 (p<0.0001)
9	The information reached me better during online courses (I heard better/ I saw better/ I wasn't distracted by the presence of my colleagues in the amphitheater etc.)	3.26 (p=0.0066)
10	I took more notes during online courses compared to the classical ones	2.59 (p<0.0001)
11	I felt more comfortable during online courses compared to classical ones	3.18 (p=0.058)
12	I felt bothered that I couldn't meet my colleagues	4 (p<0.0001)
13	I felt more comfortable using audio interaction with other colleagues during online courses	3.29 (p=0.0011)
14	I felt more comfortable using video interaction with other colleagues during online courses	2.43 (p<0.0001)
15	I'm satisfied with the way online courses took place	4.22 (p<0.0001)
16	I'm satisfied with the way online practical training took place	3.18 (p=0.032)
17	Overall, I prefer online learning over classical learning	2.3 (p<0.0001)
18	Teachers succeeded in adapting the subjects to the conditions imposed by online learning	4.1 (p<0.0001)

Impact of isolation on the learning process

The average scores and Two Tailed Student T test results for the questions regarding the impact of isolation on the learning process can be seen in table II.

Analyzing whether the restrictions of free circulation and social distancing had an impact on the students' ability to concentrate while attending online courses, we found the difference to be statistically insignificant.

The students also reported that they would have participated to the same extent to online courses even if the Emergency State restrictions had not been in force ($p<0.0001$). Moreover, they reported that their attendance was better compared to the classical courses.

The efficiency of the learning process was found to be decreased by self-isolation.

Evaluation of the online learning process

The average scores and Two Tailed Student T test results for the questions regarding the impact of isolation on the learning process can be seen in table III.

Students reported a lower efficiency of the online learning process and found the online practical training to be below 50% of the efficiency of classical practical training. On the other hand, online courses were found to be a good alternative to classical ones.

The difference in focusing while attending classical and online courses was found statistically insignificant. On the other hand, students reported that their concentration was influenced by the ambiance in which they attended the online courses and that they were more easily distracted by other activities.

Students reported that they did not generally perform secondary activities, like cooking, cleaning, watching TV etc. while attending online courses. On the other hand, when we compared the average score obtained by PC users to the average score obtained by all the participants that responded to this question, using the single sample T test, we found that the students who used the PC performed significantly fewer secondary activities than the rest of the students, who used portable devices.

Analyzing the results, we found that students preferred watching the courses live to the detriment of watching the recording whenever they feel adequate. They considered that the information reached them better while attending online courses compared to classical ones and they took fewer notes. Even if the difference in comfort between classical and online courses was found to be statistically insignificant, the students who lived alone felt less comfortable than the rest of the students. Moreover, all of the students were displeased with not being able to meet with their colleagues.

For determining which kind of interaction during online lectures is preferred by students, using the Paired T test we compared the average scores of the comfort reported by students when interacting audio and video. We found that students were significantly more comfortable with using audio interaction.

Even if the students reported that they did not prefer online learning over classical learning, using the Paired T test, we found that students were significantly more satisfied with the way online courses took place compared to the way online clinical training took place. They also felt that the teachers succeeded in adapting the subjects to the conditions imposed by online teaching.

Discussion

The majority of our respondents were females. A potential explanation might be the fact that females were more susceptible to stress and anxiety during the Covid-19 pandemic, agreed by Xiong et al [24]. Contrary to that, there were no differences between genders in any of the categories of the questionnaire, in contradiction to the pre-pandemic findings of Lindh Falk et al. [25], suggesting that the transition to online teaching process affected all the students to the same extent. This statement is strengthened by the fact that there were also no differences between students from different years of study**.**

Although social distancing and circulation restriction did not have an overall impact on student concentration, the students that used the PC for online courses were negatively influenced. One explanation might be the lack of mobility of the PC, students not having the possibility of finding a better place to concentrate during online courses. Difficulty in concentration among students was also reported by other authors, but it was due to the situation caused by the Covid-19 pandemic [26], not necessarily by the restriction imposed by the Government during state of emergency.

Students reported that the conditions imposed by self-isolation during the COVID-19 pandemic did not increase the efficiency of the learning process, although most of the students stayed at home, having no other activities. This implies that the learning process is not only conditioned by the amount of time allocated to studying, but also by the mental wellbeing of the students, which was greatly affected by governmental restrictions. An increased overall frequency of psychological distress and poor mental health was found among students during the Covid-19 pandemic [27,28], with a greater frequency in students who perform physical exercises less than 30 minutes a day [28]. During the lockdown, the motivation and frequency of physical exercises was found to be lower [29]. These results imply that the mental state of the students was greatly affected by the Government's restrictions, having a negative impact on the efficiency of the learning process, results confirmed by other studies [27,30,31].

Attendance to the online courses was better than to the conventional courses, and students reported that they would have participated in them regardless of circulation restrictions. This indicates that students find attending online courses easier than going to conventional ones, results also confirmed by Darici et al. [32] and Mokhtari et al [33].

Analyzing the answers of students regarding other activities carried out during online courses, like cooking, cleaning, watching tv etc., the average score was 2.44 ($p<0.0001$), which indicates that students did not usually perform other activities during the courses. This was better indicated by students who used the PC for online courses, as they reported a significantly lower score than the average. Students also reported that they were more distracted by other activities during online courses compared to the conventional ones, results confirmed by other studies [34,35]. Also, their concentration was greatly influenced by the ambiance in which they attended the course. The impact of ambiance was also reported by Dost et al., who found that family distraction is a common barrier to using online platforms for teaching [36].

Lack of human interaction has a negative influence on people in general, and it even has a toll on the students' learning process, as they reported that they felt displeased with the lack of direct interaction with their colleagues. Similar findings were reported by Shetty et al. [34] and del Arco et al [37]. This was also partially confirmed by the fact that students did not prefer watching the recording of courses whenever they felt adequate but prefer live courses. A potential explanation consists of the necessity of human interaction for students, interaction that is impossible when watching a recording.

Although the level of comfort felt by students while attending the online courses compared to conventional ones was not significantly different, the comfort felt by students who lived alone, without their family or roommates was significantly lower. This strengthens the idea that the learning process is influenced by the student's mental wellbeing which can be negatively influenced by the lack of human interaction [38].

Regarding the method of interaction used for online courses, students felt significantly more comfortable using only audio and avoid using video interaction. Intimacy and private space are an inherent need to every person, so it was to be expected that students would not want to share some aspects of their life, like the clothing they wear, the exact posture and place adopted during online lectures, their physical aspect, which might have been affected during the state of emergency, or the aspect of their room or the room they were using while attending online lectures. We found no study assessing the online interaction method preferred by students, but Singhi et al. found that 87% of students felt more comfortable offering answers during online teaching if an anonymous poll was used, partially agreeing with the need for intimacy that we have found [39].

Evaluating online practical activities, we have found that students felt they had less than 50% of the efficiency of traditional onsite practical activities. Students also reported they were significantly more satisfied with the way online lectures were carried out than the way online practical training was carried out. These results came in accordance with the findings of another study, which determined that a modified online curriculum that includes online theoretical courses and hands-on clinical practice provides better results regarding the performance of students than an exclusively online curriculum [10], with another study suggesting that only 16% of dental students believed that online practical activities were more useful to them than traditional ones [23]. Our results are furthermore confirmed by other studies who have found that some methods of online teaching can provide improvements in the learning performance of medical students compared to classical teaching [7-10]. Our study also partially confirms the results of another study by Iosif et al. that assessed the viewpoints of Romanian dental students, reporting a very high educational impact in terms of acquisition of practical skills, but the students evaluated the efficiency of the online teaching as neutral [31].

Comparing online courses to the classical ones, students reported that the information reached them better (heard better, saw better etc.), but the lower score reported for concentration was not statistically significant. Although the overall efficiency of online learning compared to the classical version, as reported by students, is significantly lower, the students felt that in the current situation, online courses were a good alternative to face-to-face ones. These results indicate that online courses are a good alternative for the moment, converging with the findings reported by Narain et al. [40], but online practical activities are not, failing to succeed in doing their task. This can be explained by the fact that courses only contain theoretical information, which can be easily transmitted online, but the onsite practical activities require students to do manual work, which cannot be done at home. These results are in agreement with a study by Iurcov et al., in which two thirds of Romanian dentistry students reported that they felt their practical training was affected and that not all subjects can be taught online [41]. Given the views of the students regarding online courses and online practical training, a good compromise alternative might be continuing the educational process in the future with online courses and classical practical training, as studies suggest that students would prefer combining classical teaching with e-learning [42].

In the students' opinion, which contradicts the findings of del Arco et al. [37], teachers succeeded in adapting the information to the conditions imposed by online learning, but they do not prefer online learning to conventional learning. This indicates that the lower efficiency of online learning is not caused by the lack of adaptation on the part of teachers to this style of teaching, but is due to the fact that classical teaching brings more advantages than disadvantages to dental students, as dentistry is a profession where manual practice is vital.

One of the limitations of this study was imposed by the assessment of the viewpoints of dentistry students

exclusively, being thus unable to report a complete image of the educational impasse created by the outbreak of the Covid-19 pandemic. Data gathering for this questionnaire was done less than two months after the state of emergency was declared in Romania. This is another limitation of our study, as the viewpoints of the students could have changed in the following months. We suggest further studies in assessing the way online teaching is perceived by students, the impact of distance learning on future professional evolution of students and the methods that can be used to improve the deficiencies encountered by online education.

Conclusion

In conclusion, despite the lower efficiency of online learning compared to classical learning, in the situation created by the outbreak of Covid-19 pandemic it was a good alternative that helped students continue their education. A very important factor in the educational process was human interaction, having a significant impact on student's mental status. The environment greatly affected the concentration of the students, decreasing the quality of the learning process although attendance was higher. Because there was a positive attitude towards online courses and a negative one for online practical activities, online courses and onsite clinical training could be a better alternative for continuing the educational process in the future, as a compromise method, if situations similar to the one created by the Covid-19 pandemic are ever going to occur again.

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