



The impact of COVID-19 on dental education in Tunisia

L'impact du COVID-19 sur l'enseignement en médecine dentaire en Tunisie

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ABSTRACT

Introduction: Coronavirus disease 2019 (COVID-19) pandemic might have an unprecedented impact on dental education.

Aim: The main aim of this study was to investigate the impact of COVID-19 among Tunisian dental students.

Methods: This was a cross-sectional study carried out from January to March 2022, at the Faculty of Dental Medicine of Monastir (FDMM), Tunisia. The population consisted of the 3rd, 4th, 5th and 6th year dental students registered for the academic year 2021/2022 at the FDMM. The potential number of participants was 881 according to the administration of the faculty. The applied questionnaire was made of 17 questions adapted to the Tunisian context. Incomplete answers were considered as exclusion criteria.

Results: A total of 446 students responded to the online survey giving an overall response rate of 50.6%. The study revealed that the FDMM was not doing its best to solve the challenges associated with the COVID-19 pandemic for 88.8% of the responders. Dental students were concerned about the impact of COVID-19 pandemic on their dental education (69.6%) especially about graduating on time (63.0%) since changes made in dental medicine education due to the pandemic were stressful for 61.1% of them. The students reached emotional support from their family and friends (46.5%) whereas only 9.8% of them requested assistance from faculty's staff.

Conclusion: This study provides information about the impact of the COVID-19 pandemic on dental education. These findings may sensitize officials in the FDMM to take measures in order to deliver better education to dental medicine students.

Key words: Education, Distance learning, Pandemics, North Africa.

RÉSUMÉ

Introduction: La pandémie du coronavirus (COVID19) pourrait avoir un impact sans précédent sur l'enseignement en médecine dentaire.

Objectif: Etudier l'impact de la pandémie du COVID-19 sur les étudiants en médecine dentaire en Tunisie.

Méthodes: Il s'agit d'une étude descriptive menée entre janvier et mars 2022 à la Faculté de Médecine Dentaire de Monastir (FMDM). La population source était formée des étudiants inscrits en 3ème, 4ème, 5ème et 6ème année lors de l'année universitaire 2021/2022. Le nombre potentiel des participants était de 881 selon l'administration. Les données ont été collectées via un questionnaire composé de 17 questions adaptées au contexte tunisien. Tout formulaire incomplet était exclu.

Résultats: Un total de 446 étudiants ont répondu au questionnaire (taux de réponse de 50,6%). L'étude a révélé que la FMDM n'était pas impliquée dans la résolution des défis associés à la pandémie du COVID-19 par rapport à l'enseignement pour 88,8%, en particulier le retard d'obtention des diplômes (63,0%). Les changements apportés à la formation pendant la pandémie étaient stressants pour 61,1% d'entre eux. En effet, 46,5% ont trouvé un support affectif auprès de leurs familles et de leurs amis alors que seulement 9,8% ont sollicité l'aide du personnel de la faculté.

Conclusion: Cette étude a fourni des informations importantes sur l'impact de la pandémie de COVID-19 sur l'enseignement à la FMDM. Ces résultats devraient inciter les responsables à instaurer de nouvelles mesures afin de préserver le niveau de l'enseignement.

Mots clés: Enseignement en ligne, formation académique, pandémie, Afrique du nord.

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INTRODUCTION

Coronavirus disease 2019 (COVID-19) broke out as an epidemic in December 2019 in Wuhan city [1]. The virus responsible for COVID-19 was identified and sequenced in China. It was named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1]. Fever, sore throat, fatigue, cough, and dyspnea are considered as the typical manifestations of COVID-19. Most of the patients with COVID-19 have mild or moderate disease. However up to 5-10% present with severe and even life-threatening disease course, and 32% needed intensive care. The mortality rates are approximately 2% [2].

Due to its higher transmission competence, this virus quickly spread across the other provinces of China and the near countries in East Asia, and the risk for a fast global spread was predicted [3]. The first case detected in Tunisia was on the 2nd of March 2020 [4] and, on 11th March 2020, the World Health Organization announced that the situation reached the pandemic stage [5]. Unfortunately, there was no medication that was approved by the Food and Drug Administration. Although the strongest and most effective weapon that society had against this virus is prevention. In fact, preventing its spread and its impact on the health care systems required these measures [6]: early screening and diagnosis, isolation, quarantine, prohibited mass gatherings, closures of places of work and educational institutions, E-learning...

Daily life was affected during this pandemic despite global efforts made to mitigate the disease spread [7]. This disruption concerned dental students [7]. Many institutions closed campuses, transitioned from in-person to e-learning and had their clinical activities postponed [7]. These measures impacted the educational institutions mission and the mental health of students [7]. In Tunisia things did not go differently and the Tunisian dental students were not spared. This pandemic disrupted their academic and personal life and left them prone to anxiety about redesigned classes, patient care, inability to fulfill clinical requirements for graduation, and concerns for safety [8]. This troubling situation increased stress and other mental health issues which were already prevalent among students even before the COVID-19 crisis [8]. Therefore, the main aim of this study was to investigate the impact of COVID-19 among Tunisian dental medicine students on their academic education.

METHODS

Study design and setting

This was a cross-sectional and descriptive study carried out from January to March 2022, at the FDMM, Tunisia. The latter is the only university institution authorized to train future dentists in Tunisia. It was created in 1975.

Participants

This was a study with a convenient non-probability sampling design. The population consisted of the 3rd, 4th, 5th and 6th year dental students registered for the academic year 2021/2022 at the FDMM.

The potential number of participants was 881 according to the administration of the faculty previously cited. Incomplete answers were applied as exclusion criteria.

Questionnaire

The applied questionnaire was made of 17 questions, written in English used in a multi-institutional survey and adapted to the Tunisian context [9]. A pilot test involving

30 students randomly selected indicated no need for any adjustments to the questionnaire. The last was divided into three sections. The first section was related to the participants' sex, the class where they are registered and the type of practice they plan to start after being graduated. The second one consisted of questions documenting the impact of the pandemic on courses. The last section concerned the impact of the COVID-19 pandemic on dental students. A final question asked them to select coping strategies among six proposals in relation to their perceived stress levels. The estimated time to respond to the questionnaire was ten minutes.

The online questionnaire was created using Google forms. A link was sent to all the students via e-mail and shared on the students' Facebook group. The e-mails were obtained via the administration of the faculty. A reminder was sent every two weeks during the three months of the study in order to increase the participation rate. Sufficiently clear and detailed information about the purposes of the study was given. No time limit was imposed for completion of the questionnaire.

Statistical methods

Categorical data were expressed as frequency. All the mathematical computations and the statistical procedures were performed using SPSS software (Social Package Statistical Sciences, version 18, USA).

Ethical consideration

This study was a part of a project assessing the impact of COVID-19 on dental education among students and residents (post-graduate students). The research protocol was approved by the Ethical Committee of the FDMM (approval number 12012022). It was conducted in accordance with the Declaration of Helsinki.

All participants were enrolled voluntarily without any direct benefits and were individually informed about the purpose of the study. The completion of the questionnaire by each participant was taken as a form of individual consent to contribute to this study.

RESULTS

A total of 457 students, among the 881 registered at the FDMM during the academic year 2021/2022, responded to the survey. Eleven questionnaires were excluded for incomplete answers. Therefore, the number of included students in the present study was 446 giving an overall response rate of 50.6% (Figure 1).

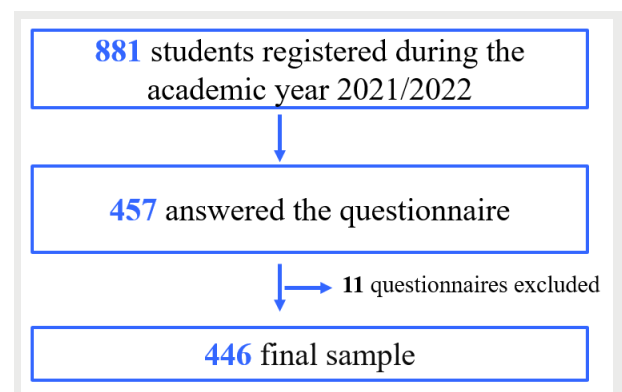


Figure 1. Study flowchart

Table 1 describes the characteristics of the dental students. The majority of them were female (81.4%) and most of them were registered in the 6th year (32.1%). Most respondents (53.1%) are planning to open a private practice

or clinic of their own.

Table 1. Characteristics of the participants (n=446)

		Number	Percent
Sex	Male	83	18.6
	Female	363	81.4
Academic year	3 rd year	104	23.3
	4 th year	90	20.2
	5 th year	109	24.4
	6 th year	143	32.1
Future practice	Solo	237	53.1
	Group	52	11.7
	Community health center	90	20.2
	Other	67	15.0

Table 2 describes the impact of the COVID-19 on courses offered at the faculty of dental medicine of Monastir. Its main conclusions were 1/No training about the COVID-19 were given during the pandemic to 55.7% of the students; 2/Clinic activities and direct courses had stopped entirely for 23.2% and 43.5% of them respectively; 3/Courses had moved to entirely online in 37.5% of the cases but this transition went smoothly for 73.8% of the students because the faculty body was not prepared at all for this transition; and 4/The FDMM was not doing its best to solve the challenges associated with the COVID-19 pandemic for 88.8% of the responders.

Table 2. Impact of the COVID-19 on courses (n=446)

		Number	Percent
Did you have training about the COVID-19?	Yes, multiple	26	5.8
	Yes, a few	172	38.5
	None	248	55.7
Did your school stop all dental students' clinic activities?	Yes, no exceptions	104	23.2
	Yes, but some clinics were allowed to continue	246	55.2
Did your school stop direct courses and lab activities?	No	96	21.6
	Yes, entirely	194	43.5
Did your school move courses to online?	Yes, but we still had a couple activities in campus	195	43.7
	Not at all	57	12.8
Did the transition to online courses go smoothly?	Yes, entirely	167	37.5
	Yes, but we still had a couple activities in campus	245	54.9
	Not at all	34	7.6
Did you perceive the faculty body was prepared for the online transition?	Yes, entirely	45	10.1
	Yes, with some trouble	284	63.7
	Not at all	117	26.2
To what extent do you think your school is doing their best to solve the challenges associated with the COVID-19 pandemic?	Yes, entirely	14	3.1
	Yes, most of them	84	19.0
	A few	229	51.3
	Not at all	119	26.6
To what extent do you feel that you have support from the faculty?	To a very great extent	6	1.3
	To a great extent	44	9.9
	To some extent	225	50.4
	To a little extent	137	30.8
	Not at all	34	7.6

COVID-19 : Corona Virus Disease 2019

Table 3 displays the impact of the COVID-19 on dental students. Its main conclusions were: 1/Students felt support from their family/friends (81.2%) and their peers (48.8%) whereas the FDMM failed in this mission (90.6%); 2/They were concerned about the impact of COVID-19 pandemic on their dental education (69.6%) especially about graduating on time (63.0%); and 3/Changes made in dental education due to COVID-19 pandemic were stressful for 61.1% of the students.

Table 3. Impact of the COVID-19 on dental students (n=446)

		Number	Percent
To what extent do you feel that you have support from the faculty?	To a very great extent	6	1.3
	To a great extent	36	8.1
	To some extent	149	33.4
To what extent do you feel that you have support from your family and friends?	To a little extent	255	57.2
	To a very great extent	177	39.6
	To a great extent	185	41.6
To what extent do you feel that you have support from your peer dental students?	To some extent	72	16.1
	To a little extent	12	2.7
	To a very great extent	44	9.8
To what extent are you concerned about the impact of COVID-19 pandemic on your dental education?	To a great extent	174	39.0
	To some extent	186	41.7
	To a little extent	42	9.5
	Extremely concerned	136	30.5
To what extent are you concerned about graduating on time?	Very concerned	176	39.4
	Somewhat concerned	94	21.2
	A little concerned	29	6.5
	Not concerned at all	11	2.4
How stressful are the changes made in your dental education due to COVID-19 pandemic to you?	Extremely concerned	161	36.1
	Very concerned	120	26.9
	Somewhat concerned	86	19.2
	A little concerned	50	11.2
How stressful are the changes made in your dental education due to COVID-19 pandemic to you?	Not concerned at all	29	6.6
	Extremely stressful	98	22.1
	Very stressful	174	39.0
	Somewhat stressful	123	27.5
How stressful are the changes made in your dental education due to COVID-19 pandemic to you?	A little stressful	39	8.8
	Not stressful at all	12	2.6

COVID-19 : Corona Virus Disease 2019

Figure 2 presents the different strategies adapted by students to cope with COVID-19 pandemic. For emotional support, students reached their family and friends (46.5%) whereas only 9.8% of them requested assistance from the FDMM's staff.

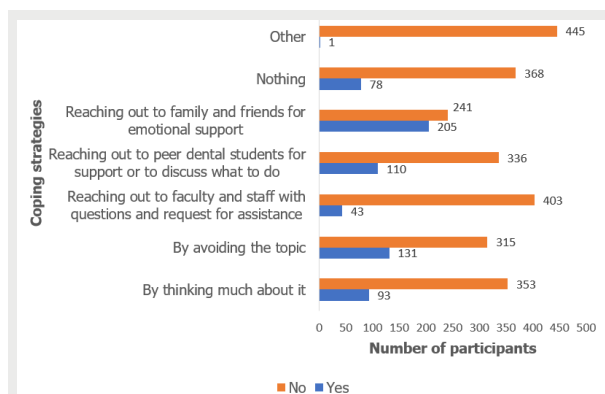


Figure 2. Coping strategies in relation to the participants' perceived stress levels

DISCUSSION

The main result of the present study involving 446 dental students was that the COVID-19 pandemic had a great impact on dental education of students registered at the FDMM during the academic years 2019/2020 and 2020/2021. These two academic years have been disrupted by the pandemic. In 2022, the COVID-19 became significantly less fatal than it was in 2020. However, these endemic conditions seemed to continue for the next few years since new variants would emerge [9]. Therefore, the next stage remained highly uncertain. This pandemic experienced worldwide affected more than 770 million students around the world due to the almost complete closure of schools,

universities and Colleges [7]. Therefore, several changes had to be brought in dental education. The e-learning may be a sensible alternative to traditional teaching methods. The digital transformation of teaching at Tunisian universities had already been in full progress during the COVID-19 pandemic. The last provided important information about the future of dental education in Tunisia and might be a unique opportunity to adapt and advance the faculty's teaching methods.

On the 12th of March 2020, the FDMM decided to suspend face-to-face courses and clinical activity until the end of the academic year. Exams resumed between June and July. Regarding the academic year after (2020/2022), in-class courses were suspended again for two weeks and 10 days in November 2020 and May 2021 respectively except clinical activity for the 5th year. Exams were also disrupted in January 2021. For these reasons, students registered in 1st and 2nd years during the academic year 2021/2022 were not included in the present study because they were not affected by the COVID-19 pandemic. The response rate was relatively low (50.6%) in spite of three invitations and reminders as well as no time limit to respond to the questionnaire. The reply ratio was higher in similar studies led in Saudi Arabia [10] and Romania [11] (65% and 59.6% respectively). Web-based questionnaires were reported to have lower response rates than paper-based questionnaires [12]. Female students were more represented than male students. The feminization of dentistry had been noticed in previous studies led at the FDMM [13].

The FDMM was unprepared to confront the COVID-19 pandemic. This lack of preparation may be explained by insufficient infrastructure and financial conditions [14]. Pre-clinical training had been suspended but clinical training had been provided to some extent in order to handle emergencies. This finding was different from what was observed in most dental faculties [15]. In fact, clinical training with patients was considered a high-risk activity during the COVID-19 pandemic.

As a consequence of this pandemic, the FDMM was obliged to switch to e-learning for the first time. This transition has failed according to Tunisian students. They indicated that the faculty members were not doing their best as limitations of online learning. These results were in line with those reported in similar studies [14, 16, 17]. The success of e-learning depends on basic computer and typing skills of both teachers and students [18, 19]. Therefore, experience with regards to technology is necessary [20].

Many obstacles, including technical, financial, adaptation-related, or pedagogical in nature, have been associated with e-learning during the COVID-19 pandemic [14]. However, there were also studies that reported students' positive experiences towards e-learning [21-23]. The advantages of distance education are higher motivation in learning, easier participation, and less time and effort spent [23].

Klassen et al. [9] concluded that e-learning is as effective as traditional methods. The experience of distance education, due to its flexibility and accessibility, can lead to a higher performance and better knowledge [24, 25].

Therefore, the COVID-19 pandemic posed a tremendous challenge to both faculty and students [26]. The first has to fundamentally reevaluate methods of carrying out teaching activities. As for, students should change their attitude (attention, interaction, feedback ...) during courses to guarantee the effectiveness of distance education.

A 2022 research stated that most of the Tunisian dental students preferred hybrid education over traditional learning [26]. A study by Ertürk and Delikan [14] also emphasized that hybrid teaching is the most suitable

method.

These changes observed in dental courses induced stress among participants [27]. The main causes of dental students' stress can be: first of all, the fear of contracting COVID-19 and of spreading it to others [27]. This finding was also reported by similar studies [28-30]. This fear of infection by the virus may be explained by the fact that dentistry is among the professions that face a high risk of COVID-19 transmission, both for specialists and patients [31]. Then, dentistry is a stressful profession [32]. In addition to the unfavorable context of the COVID-19 pandemic, dental students are confronted with common stressors such as extensive coursework, pressure to do well, learning clinical procedures, and dealing with difficult patients [33, 34]. Finally, it would be difficult to separate the isolated effects of COVID-19 on Tunisian dental students without taking into consideration the specific circumstances in Tunisia since 2021 (Political changes and economic crisis). In addition, participants were concerned about the impact of COVID-19 pandemic on their dental education especially on practical training [26]. In fact, clinical academic activities (except for the emergency) in Tunisia, in addition to dentistry courses have been suspended. The extended period that dental students went through without practicing dental procedures made them fear that they would lose their manual dexterity skills [35]. This situation may lead to a fear of mistakes or of not being able to perform the necessary procedures [27, 36]. To deal with this situation, participants adopted coping strategies. The main coping strategy adopted by the students in order to reduce their stress levels was reaching to their family and friends. In fact, students felt support from their family/friends. This result is different from what was found by Klaassen et al. [9]. However, the FDMM failed in this mission despite the need for support for students in general and especially during the COVID-19 pandemic [37]. In fact, the attention to student wellbeing is commendable, as there will be understandable anxiety and confusion [15]. In addition, the FDMM support was shown to be associated with lower stress levels in dental students [38]. Therefore, it is important to look towards life after the COVID-19 pandemic [9]. It will be interesting to investigate the changes in prominent stressors of dental students since the relationship faculty-student is a critical mediator of stress and anxiety in dental school pre-COVID-19 and will be a possible prominent mediator after the pandemic [9].

Study limitations

This study had three limitations. First, the application of a non-standardized questionnaire is a methodological limitation. The questionnaire is deemed adequate to evaluate the satisfaction and stress levels among dental students. However, there are better stress measurement tools such as the Stress Appraisal Measure, the Impact of Event Scale, and the Perceived Stress Scale [14]. In this study, an additional validated questionnaire to assess students' stress levels should have been added. Second, the cross-sectional design of the study does not identify causal associations. This reveals the need for conducting longitudinal studies [39]. Another limitation of the study is that it was limited to the FDMM. Therefore, the results may not be generalized to other dental students.

CONCLUSION

This study provides information about the impact of the COVID-19 pandemic in both dental education and undergraduate students' lives in Tunisia. These findings may sensitize officials in the FDMM to take measures in order to deliver better education to dental students virtually.

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