Evaluation of the impact of the Covid-19 pandemic on the teaching of otolaryngology and cervico-facial surgery

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Abstract

Background: During the Covid-19 pandemic, distance learning is increasingly present in the field of education, particularly in the health sciences. This type of teaching has emerged as the appropriate solution to the problem of knowledge transfer. The objective of this study is to evaluate the impact of distance learning of the ENT (ear, nose and throat) and CFS (cervico-facial surgery) module on students and the impact of the pandemic on their quality of life.

Methods: We conducted a survey on students’ feelings about distance learning courses, the impact of the pandemic on their lifestyle and the consequences of the protective measures required for their exams (masks, visors). A google forms’ questionnaire of 29 questions was sent to 509 students and a total of 110 anonymous responses were collected.

Results: The collected data indicate that 73.8% of the students were satisfied with the distance learning and felt that the ENT courses were sufficient to achieve the educational objectives. We also found that the protective measures had an impact on maintaining concentration during the face-to-face final exams and that the confinement caused by the pandemic had a significant impact on the students’ quality of life.

Conclusion: Distance learning proved to be a good alternative during the lockdown period. Indeed, students reported considerable benefit, despite the fact that this method does not replace the effectiveness of the face-to-face teaching.

Keywords: Distance learning, ENT surgery, Simulation, Covid-19, Confinement

1. Introduction

Covid-19 is a coronavirus-like virus that was first detected in December 2019 in Wuhan City, China and then spread worldwide, causing a pandemic. The first cases of Covid19 infection appeared in Morocco in March 2020 and the pandemic grew within weeks. As in many countries, containment and sanitary measures were adopted to contain the virus spreading [1].

All aspects of life were modified: wearing masks, physical distancing, hand washing, leaving the house only in case of major force, closing factories, shops, etc.

Schools and faculties were closed, and educational institutions had to adapt and switch to a new teaching method called “Distance Learning” [2]. Distance learning is a method of learning that has been around for a long time.

In 1840, England witnessed the birth of distance learning, called “Correspondence Teaching” [3].

With the advanced technology and the globalization of the Internet, this type of education became more important and broadly implemented. As early
as 1995, one third of institutions in the United States were using distance learning [4].

Subsequently, and especially in the last 2 decades, this type of education has become more accessible, worldwide. In the healthcare field, distance learning has been slower to be implemented compared to other areas [3,4].

During the containment related to the covid-19 pandemic, distance learning was the only solution to the education problem. In Morocco, it has become widespread in all public and private educational institutions, including elementary, middle and high schools, as well as colleges and universities.

At the Mohamed VI University of Health and Sciences (UM6SS), the teaching was provided on a hybrid mode before the pandemic, but upon the SARS-CoV2 pandemic onset, distance learning was adopted exclusively.

This type of teaching was therefore provided within the University to all students, regardless of their field of study. The courses and interactive videoconferences were carried out via a platform (Canvas) where professors and students can connect from their homes, using computers, tablets or cell phones.

ENT education is available to students in the 2nd and 5th years of medicine; 1st years of pharmacy and speech therapy; 2nd years of nursing, physical therapy and medical imaging technician; for a total of 509 students. The ENT courses were taught by the assistant, associate and tenured professors. The face-to-face main lectures were held for 4 h per week in the lecture hall and 1.5 h of tutorials every 2 weeks from January 2020 to March 2020 (until total confinement). From April 2020 to June 2020, all ENT courses were given remotely, using the zoom platform.

The face-to-face examinations in the context of the pandemic took place with special sanitary measures (compulsory wearing of masks, barrier gestures, examination room capacity reduced to 50% with a safety distance between each student).

The aim of this survey was to evaluate the satisfaction and the perception of the students towards distance learning of the of otorhinolaryngology (ENT) module and cervicofacial surgery (CFS), the impact of the confinement on their quality of life and the repercussion of the means of protection during the final exams.

2. Methods

2.1. Study setting

This study was conducted at the Mohammed VI University of Health and Sciences in Casablanca, Morocco.

The study was conducted in August 2020, a google forms’ questionnaire was sent to 509 students and remained open during the entire month.

2.2. Method

To carry out this study, inclusion and exclusion criteria were established.

2.2.1. Inclusion criteria

The students involved in this survey were those who had received an e-learning in ENT from the university during the containment and had answered our questionnaire.

2.2.2. Exclusion criteria

Students who had ENT education but did not fully respond to the questionnaire.

Students who did not have ENT courses in their semester program.

➢ Therefore, out of a population of 509 students, only 110 participants were included in this study.

3. Materials

3.1. Data collection

This is a quantitative and qualitative analytical study to evaluate distance learning during the pandemic and the impact of protective measures during the final exams.

For this purpose, we developed a questionnaire using Google Forms and including 29 questions and published online (Additional data).

The questionnaire was divided into different sections.

➢ Questions 1 through 4 were related to the type of connection devices and support used by the students to attend the course.

➢ Questions 5 through 7 were about distance learning before the lock-in period.

➢ Questions 8 through 16 addressed distance learning during the lockdown.

➢ Questions 17 to 22 assessed the impact of protective measures on students’ comfort and concentration during exams.

➢ Questions 23–26 asked about the impact of lockdown on students’ quality of life and mental health.

➢ Questions 27–29 asked students about their preference for teaching modality.
This questionnaire was sent to the 509 students by email and on WhatsApp on the groups of the target classes and tracks. We recorded 110 responses.

3.2. Data analysis

Analysis of the data collected through the questionnaire was performed by Microsoft Excel v.2016. Thus, for each section, we established averages, standard deviations and 95% confidence intervals (CI 95).

4. Results

➢ Age and gender distribution

Out of the 110 students included in this study, 75.5% were female (n = 83) and 24.5% were male (n = 27) (Fig. 1).

Regarding the age distribution, 8.2% were between 17 and 18 years old; 52.7% between 19 and 20 years old; 20% between 21 and 22 years old; 17.3% between 23 and 24 years old; 1.8% were older than 25 years (Fig. 2).

➢ Distribution by field and level of study

For the fields of study, 53.6% of the participants were in medicine; 8.2% in pharmacy; 27.2% in speech therapy; 8.2% in nursing program studies, and 2.7% in medical imaging technician studies.

In terms of level of study 45.5% of participants were in 1st year, 26.4% in 2nd year, 3.6% in 3rd year, 0% in 4th year, and 24.6% in 5th year.

➢ Computer connection and support

Out of the 110 students included in this study, 91.8% were confined in the Casablanca-Settat region, 1.8% in the Rabat-Salé region and 6.4% in other regions of Morocco.

All participants had an internet connection at home, 52.3% ADSL, 37.6% optical fiber and 9.2% 4G.

In 89.1% of the cases, the students had followed the courses on their computer, and 10.9% on a smartphone or tablet.

About 79.1% of the students had never participated in distance learning before the pandemic while 20.9% had previously participated in distance learning (Fig. 3).

➢ Students’ satisfaction with distance education (Q8) was a mean of 3.24/5 (2.98; 3.49) with $V = 1.87$.

73.8% of the students were satisfied with the distance learning and felt that the ENT courses were sufficient to achieve the educational objectives (69.3%).

The causes of dissatisfaction reported by 91 students were problems with the internet connection (50%), poor audio quality during the course (50%), unfavorable work environment (42.8%), little or no interactivity with the professor (43.9%) and unsatisfactory course quality (16.4%).

The achievement of pedagogical objectives and the degree of motivation are shown in Table 1.

➢ Duration of maintained focus in online courses (Q14)

In 10.4% of the cases, focus was maintained for less than 15 min; 29.2% between 15 and 30 min; 26.4% between 30 and 45 min; 23.6% between 45 min and 1 h; 9.4% more than 1 h and 0.9% for 4 h with a break between each hour (Fig. 4).

Question 15 assess the number of hours spent studying before the pandemic and question 16 during the pandemic during distance learning (Fig. 5A,B).

34% of students studied before the Covid-19 pandemic an average of 4–6 h; 28% studied between 2 and 4 h; 22% between 6 and 8 h; 8% less than 2 h; and 4% studied between 8 and 10 h or more than 10 h (Fig. 5A).

As for after the pandemic, 34% of students studied between 4 and 6 h; 33% between 2 and 4 h; 15% between 6 and 8 h; 12% less than 2 h; 4% between 8 and 10 h and 2% more than 10 h (Fig. 5B).

➢ Impact of the protection measures against contamination on the comfort and level of students’ focus during exams (Q18-Q22).

Tables 2 and 3 group the results.

➢ Impact of the pandemic on quality of life (Q23).
The impact was evaluated in the 4 aspects of life: physical health, mental health, family life and leisure, the results are summarized Table 4.

The need for psychological support to continue studying during this pandemic (Q24) was expressed by 47.3% of the students (Fig. 6).

Regarding the students who received a covid-19 test and those who were infected at the pandemic onset (Q25-26), the results are summarized in Fig. 7.

88% of students received a covid-19 test while 12% did not (Fig. 7A). And 99% of students were infected by the SARS-CoV2 virus, while 1% were not (Fig. 7B).

In terms of teaching mode, 58.2% of students found face-to-face teaching more relevant to take ENT courses (Q27).

The students’ preferences concerning distance learning (Q28) are summarized in Fig. 8. 49.7% participants wished to continue distance learning courses; 41.3% were against; 8% wished to have hybrid courses and 1% wished to never have a distance learning course.

Question 29 was open-ended to gather participants’ ideas and opinions for optimizing distance education within the university.

5. Discussion

The sudden onset of the covid-19 pandemic has disrupted the educational system, worldwide prompting governments of several countries to quickly adopt the “distance learning”, to continue students’ education and training at different levels.

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5. Discussion

The sudden onset of the covid-19 pandemic has disrupted the educational system, worldwide prompting governments of several countries to quickly adopt the “distance learning”, to continue students’ education and training at different levels.
This type of education allows a knowledge transfer while limiting students’ travel and physical contact, which both represent the main source of virus spread. Distance learning has thus become the solution to complete educational programs across the globe.

Most of the students (79.1%) involved in our study had never taken an online course before the pandemic period, so it was a new experience for most of our participants.

Several studies have been carried out previously to improve and optimize distance learning. Thus, Cook and Dupras [5] reported the most effective way to create an e-learning platform for use in medicine. They emphasize the importance of a user-friendly and intuitive website design that is well maintained, as well as the integration of self-assessment features to ensure that learners are engaged [6]. During this pandemic, e-learning was further developed, as shown in a study that examined distance learning in dermatology during the covid-19 era [6].

Indeed, The American Society of Dermatologic Surgery (ASDS), continued training via webinars and had plans to expand online dermatology training [6].

Our study focuses on the students’ feelings about this type of education and indicate that 73.8% of the students were satisfied with the distance learning and felt that the ENT courses were sufficient to achieve the educational objectives (69.3%).

The study by Ahmed et al. [7] is a qualitative study based on teachers’ satisfaction with distance learning. This study revealed several points of view that were shared by the participants.

The participants agreed that face-to-face teaching had certain irreplaceable advantages such as better connection and relationship between teacher and student, better development of group work but that distance learning provided a better work environment for students [7].

![Fig. 5. A. Number of study hours per day before the Covid-19 pandemic. B. Number of study hours per day during the Covid-19 pandemic.](image)

![Fig. 6. Distribution of students expressing the need for psychological support to continue their studies during the covid-19 pandemic.](image)
The participants in our study also found the courses to be quite interactive, despite the limitation of technical means. It is true that the majority of participants (58.2%) found face-to-face teaching more relevant, but 49.7% wanted to continue distance learning courses. The study of Farahmand et al. [8] carried out in 2015 on senior medical students shows the equivalence or even the superiority of distance learning effectiveness compared to traditional teaching. In this study, 2 groups of 50 students were separated. Both groups received courses with the same content regarding the initial assessment of trauma patients. One group had face-to-face instruction while the second group had distance learning instruction. At the end of their training, both groups took a post-test and the results were compared between the 2 groups. And revealed that the experimental group that had the distance learning courses had an average score of 16.5/20 (V = 3.8; SD = 1.96) compared to an average score of 12.3/20 (V = 4.9; SD = 2.22) for the face-to-face group.

The results of our study also show that the students are motivated for this kind of teaching, especially for the environmental aspect which is appreciated by the participants at an average of 3.67/5 (the highest average of the survey). This has a growing interest in the future, whether in a pandemic situation or not.

It should be highlighted that this is a study based on students' opinions of distance learning in Morocco, which is slightly different from other studies reported in the literature. Indeed, the studies regarding the e-learning carried out over the last 30 years mostly quantified the effectiveness of this type of teaching.

Moreover, the meta-analysis of Pei and Wu [9] covering 15 of these studies which all show the superiority of online teaching for this type of students. For example, the study by Subramanian et al. [10], which compares two groups of 15 participants in relation to the results of the post-test, shows that the group that had the online courses had an average score of 86.7% (74.54; 98.86). The face-to-face group had an average post-test score of 61.7% (49.54; 73.86).

These studies therefore show a certain effectiveness of the online teaching. Our study shows a preference for face-to-face teaching, but still reports a significant satisfaction with distance learning by our participants (3.24/5). Such effectiveness and satisfaction makes it an important type of teaching that should be used more often in the future, especially in the Moroccan context.

This survey also shows the impact of the protection measures on the focus and comfort during the exams, which was rated from 0 to 5. The score of 0 means that the students do not feel any difference with or without the protection means. However, we notice that the averages of the results were quite high: 3.36/5 for the respiratory discomfort, 2.78/5 for the visual fog during the examination, 2.69/5 for the impact on the focus and 3.19/5 for the impact on the comfort. We can therefore conclude that these means of protection are an additional stress factor for the participants, and that it is subsequently difficult to conduct a quantitative study with a post-test under these conditions.

![Figure 7](image1.png)  **Fig. 7. A. Percentage of students who received a covid-19 test. B. Percentage of students who have been infected by the SARS-CoV2 virus.**

![Figure 8](image2.png)  **Fig. 8. Distribution of participants wishing to continue distance learning courses.**
This study also shows the impact of the pandemic on the students' level of focus, which is altered compared to before the pandemic. There was a significant decrease in the studying time. In the literature, studies related to the effect of the use of protective equipment show that there is a minimal physiological impact, but theoretical evidence suggests that there may be a consequential psychological impact, particularly on competence and autonomy at work [11].

Finally, it is worth highlighting the important impact of this pandemic on the different aspects of life. Our investigation showed that the consequences are more important on leisure (3.13/5) and on family life (2.77/5), as well as on other domains: physical health at 2.49/5 and mental health at 2.57/5. Indeed, our study showed that 47.3% of the participants needed psychological support to continue their studies during this confinement.

A study performed in Hong Kong showed similar results regarding the psychological impact of the confinement on the city’s population. Out of the 500 participants, 19% reported developing depression, 14% were anxious, and 25.4% experienced a deterioration in their mental health [12].

In this study, the questionnaire was sent by email and on social networks, so the questionnaire was open to students, there was no limit of response, participants could answer as many times as they wanted.

Nevertheless, it allowed us to evaluate this type of teaching, and therefore to improve distance learning in the future.

Other similar studies are needed to deepen our knowledge and improve distance learning.

It also will be interesting to do similar studies within the university to assess the impact of this type of teaching on students’ level in particular during exams.

6. Conclusion

This study shows that distance learning is a technique with a great potential for education improvement. The results show that the participants were satisfied with this type of learning that allowed them to achieve their objectives. We also reported that the majority of students prefer face-to-face teaching, but during the pandemic, distance learning was the only option to continue training and education. Thus, we can conclude that distance learning, although it can never replace the traditional face-to-face teaching, remains good alternative especially during the confinement.

Outside the pandemic period, it would be beneficial to combine the two types of teaching, in a hybrid mode, to maximize their effectiveness.

For better implementation of such learning modes, more studies are warranted to enrich our data and achieve better educational outcomes.

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All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.

Other relationships

All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

Conflict of interest

In compliance with the ICMJE uniform disclosure form, all authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References


Practice points

- The Covid-19 pandemic had a major impact on the quality and methodology of medical education.
- Distance learning can be as effective as traditional learning for medical students.
- Hybrid learning combines traditional classrooms with online learning. Not only does it offer students flexibility and a better work-life balance, but it is also cost-effective.