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Medical students’ perception of distance-based education during the COVID-19 pandemic in Slovenia: A qualitative study

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ABSTRACT

Introduction: The COVID-19 pandemic has had a broad direct impact on education, and at the same time it has significantly changed students’ lives. This study examines how Slovenian medical students experienced the shift to distance-based education following multiple lockdowns.

Methods: The aim of this study is to examine experiences of medical students about distance-based education in the period of multiple lockdowns in 2020/2021. We used focused interviews to collect data. The questionnaire was developed in the following manner: the first set of questions was developed after studying the literature from Slovenia and abroad about distance-based education in higher education during COVID-19 lockdowns. The researchers then discussed this set to narrow the topics. In addition to preformulated questions, additional sub-questions also typical for focused interviews were asked as part of the research. We carried out a qualitative study using a qualitative content analysis method to analyze the data.

Results: Sixteen interviews were conducted. We defined four categories summarizing students’ experiences with distance-based education during the COVID-19 pandemic: 1) technical issues, 2) organization of distance-based education, 3) social exclusion of students, and 4) suggestions for improvement. The categories are exclusive and represent individual topics for further analysis of students’ experiences with DBE during the COVID-19 pandemic. The results are supported by quotes from the interviews.

Conclusions: Medical students’ experiences with DBE mainly revealed shortcomings in computer literacy. Technical issues were largely an indicator that significantly marked students’ transition to DBE. Another important finding is that medical students emphasized problems related to social exclusion. Students made suggestions for improvements that broadly relate to the higher education system, and not only to the COVID-19 pandemic.

1. Introduction

Online education is universally accepted as a cost-effective and time-efficient alternative to traditional education. It is a teaching approach made possible by the development of information and communication technology. However, such an approach entails a number of structural and procedural changes that follow implementation. Changes are often implemented slowly, and things often do not go smoothly, as experts in education theory point out (Garza Mitchell, 2009).

The COVID-19 crisis basically plunged lecturers and students into an environment where they had to get used to what Di Giacomo and Carlo Di Paolo (Di Giacomo & Di Paolo, 2021) call distance-based education (DBE). In fact, this is a teaching practice that has been imposed on people. Many were not prepared for this. In some (poorer) countries, DBE was not possible for everyone because universities and people simply did not have enough technical equipment (Oloyede, Faruk & Raji, 2021). For example, in some African counties, and in India and Iraq, teachers and students faced inadequate internet connectivity and a lack of computers (Desai, Sen, Desai, Desai & Dash, 2020; Khan, Patra, Gupta, Sharma & Jain, 2021; Mishraa, Gustap & Shree, 2020; Mohammed, Rashid, Salih & Budur, 2020; Nadaf, 2021; Oloyede et al., 2021).

At the other end of the world, in richer countries, researchers have identified the pros and cons of DBE. Peimani and Kamalipour (Peimani & Kamalipour, 2021) evaluated the experiences students and teaching staff in the UK. They found that improved online study success requires adaptive and resilient approaches to online teaching. Students’ experiences from Sweden, after 12 weeks in lockdown, show that DBE was making life difficult and making the students distrustful of taking exams be-

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cause they only had online lectures (Almendingen, Sandsmark Morseth, Gjølstad, Brevik & Terris, 2021).

In the same studies, the authors highlight a number of other situations that have influenced subsequent DBE. These can roughly be divided into three groups. Some situations refer to technical equipment and conditions that are necessary for implementing DBE, such as computer literacy or technical issues (e.g., insufficient bandwidth). The second group of situations relates to the physical and social distance of students from lecturers. Survey respondents mentioned a lack of academic contact with peers and staff, and lack of social contact with peers. The third group includes issues such as students’ problems (reduced motivation and effort, a lower learning outcome, and inadequate information about lectures and exams) and the desire to normalize the situation as quickly as possible or return to normal (Almendingen et al., 2021; Onyema et al., 2020).

A comparative perspective reveals some differences in students’ experiences. Their experiences can generally be divided into positive and negative. For example, some students highlighted benefits of DBE (saving time, easier access to online teaching resources, and better organized lectures) (Anwar, Mansoor, Faisal & Khan, 2021), whereas other students mentioned a number of problems relating both to the conduct of the lesson itself and to some socioeconomic characteristics of the student population (Almendingen et al., 2021; Di Giacomò & Di Paolo, 2021; Khan et al., 2021). COVID-19 arrived unexpectedly, and some students simply did not have the conditions to study from home because they did not have their own room or adequate computer equipment. This means that education during the COVID-19 pandemic did not feel the same for all.

Slovenia is one of the EU countries that has been most affected by COVID-19 measures. The country was closed in several waves, after several months, and it also had the longest curfew in Europe. Teachers in Slovenia first responded to the changes in education. A special issue of the journal Contemporary Pedagogy was devoted to this topic (Skubic Ermenec & Urbančič, 2021). All the studies in that special issue examine the first wave of the pandemic in Slovenia (from March to June 2020), corresponding to the spring semester of the 2019–2020 academic year. However, the second COVID-19 wave affected Slovenia much more, and the fall semester (October 2020 to January 2021) of the 2020–2021 academic year was carried out through DBE.

Not many studies in Slovenia have addressed how students in particular felt about this transition to online study or what challenges they faced. We identified studies evaluating certain tools used by individual faculties (Turk, 2020) or examining special social groups of students (Žmavc, Autor & Gril, 2020) or levels of education (Bogatec, Brezigar & Mezgic, 2021). However, we did not find any far-reaching studies identifying challenges from the student perspective and offering useful information for the future.

This study examines how Slovenian medical students experienced the shift to DBE following multiple lockdowns. We selected senior medical students that, in addition to requiring theory, require a lot of practical exercises and clinical practice. The students interviewed were asked to provide feedback on their experiences from the last academic year and to provide some suggestions for what might improve learning outcomes in future online courses.

The study also presents the findings to both decisionmakers and the wider academic community by offering suggestions aimed at correcting mistakes and improving the course of learning in the future. Because the study included only medical students, the findings are primarily related to this group of students. Generalization is thus not possible, which was also not the primary goal because the interest was in the population of medical students.

2. Material and methods

The aim of this study is to examine experiences of medical students about DBE in the period of multiple lockdowns in 2020/2021.

2.1. Study design

This study was carried out at the University of Ljubljana’s Medical Faculty from November 2020 to March 2021. We used interviews as a data collection tool. In line with the research goals, we decided to conduct focused interviews, for which the theme of the discussion is typically known in advance, and data acquisition and data interpretation are carried out in an open manner (Johnson & Rowlands, 2014).

The questionnaire was developed in the following manner: the first set of questions was developed after studying the literature from Slovenia and abroad about DBE in higher education during COVID-19 lockdowns. The researchers then discussed this set to narrow the topics. In addition to preformulated questions, additional sub-questions also typical for focused interviews were asked as part of the research (Johnson & Rowlands, 2014). In this manner we sought to offer the best conditions to give the interviewees the maximum opportunity to provide the most extensive and thorough answers.

2.2. Study population and sampling

The next phase was dedicated to training six graduate medical students, who are pursuing a PhD degree in public health. The training was held at the Department of Family Medicine on November 5th, 2021. The interviewees were medical students in their last (5th and 6th) years of undergraduate study. The last years of study were chosen because, in addition to lectures, intensive learning in the framework of practical exercises and acquisition of skills took place, which could be the most impoverished due to the covid-19 pandemic. Non-probability convenience sampling was used for the selection of participants. The sample size was not fixed prior to data collection. It was determined on the basis of saturation, which is the point in the data-collection process when new data no longer offer additional insight for the research question (Coyne, 1997). We applied the saturation process prospectively (Guest, Namey & Chen, 2020), during data collection, which allowed us to stop before reaching a pre-specified number of interviews. Accordingly, the students conducted a different number of interviews, ranging from two to five; the final number of interviews conducted was sixteen. All of the interviews were recorded and transcribed verbatim by the students that conducted the interviews.

2.3. Data analysis

We carried out a qualitative study using a qualitative content analysis method (Elo & Kyngäs, 2008). The key characteristic of this method is that extensive texts are classified into smaller content categories. The method contains an initial phase of preparation and organization, including open coding, category formation, and abstraction (Saldaña, 2012; Schreier, 2012). After determining the coding units, we used open coding to identify the categories and their classification (Elo & Kyngäs, 2008).

First, we carried out a thematic analysis of the content. We started with the preparation phase, which included the selection of analysis units. In our transcripts of the interviews, we marked the parts of the texts that we needed for further elaboration and that were connected with the research goals—that is, a sentence or more expressing a relevant declaration. In the qualitative synthesis, we used codes and categories, which means that we classified the units with respect to their meaning.

Six researchers independently coded the interviews. The study used a data-driven coding scheme, and the codes formed were sorted into logical categories to create patterns in the data analyzed and to clarify students’ experiences with DBE. During the coding process, consensus was sought between the six researchers. If consensus was not attained, we tried to achieve intercoder agreement on the differently perceived parts of the text analyzed to fit the created category, also known as the “unitizing” process (Krippendorff, 2004).
2.4. Ethical considerations

The National Medical Ethics Committee of the Republic of Slovenia (authorization no. 0120–507/2020/6) approved the study. All the participants interviewed agreed to be interviewed.

3. Results

Using qualitative content analysis, we designed three main categories: 1) technical issues, 2) organization of DBE, and 3) social exclusion of students. We named the categories based on the content they illustrate.

Each of the categories contains positive and negative experiences of the students, who were asked to verify positive and negative opinions throughout the interview. We used this methodological approach to collecting material for designing the last (fourth) category, which relates to students’ suggestions on how to improve DBE in the future. We named the fourth category “suggestions for improvement.”

3.1. Technical issues

Technical issues mostly refer to problems using the internet and other communication equipment. The interviewees pointed out the poor quality of internet connections (sometimes related to or regardless of geographical location) and problems with communication tools or video conferencing systems (e.g., Webex). Although the students understood the failure of the internet connections, they did not have much understanding for the failure of communication tools, which in some cases even discouraged them from following the lessons.

Sometimes there are problems with a poor internet connection, but unfortunately no one has much control over this. (P3)

I’m distracted by technical problems, in terms of repeated or prolonged loss of the audio or visual signal. (P5)

All these connection problems, both on our end and on the professors’ end, the poor quality of the microphones, and all that—you need good nerves to handle this. (P16)

That’s why everyone should have good internet—and also these programs, some work better, some worse; let’s say with Zoom you can still have both connected, or at least everyone’s connected through the camera, but on Webex this is really a mission impossible. (P11)

At the beginning of the distance learning, there were some problems with the use of appropriate versions of the programs, say Webex, especially in terms of the number of participants; the limit was one hundred people. A few times it happened that I couldn’t join the lecture because the participant capacity was full. (P1)

The human factor was also highlighted as disruptive. Some students (or lecturers) were simply not skilled in the use of communication tools, and often the course of the entire matter was also disturbed by pressing the wrong buttons, which introduced additional confusion into teaching. Some interviewees also pointed to frequent changes between various communication tools as a disturbing factor, which introduced confusion during online teaching.

There were problems at the beginning when they didn’t give us the right links, or the professors couldn’t find the links; they didn’t know how to use Zoom or the waiting rooms. (P12)

I find it more confusing when it’s mixed and when you use half one, half the other, because that’s when confusion often happens, especially with links, and which link you have to sign up for now. On the same day sometimes the professors set up one link for the whole day, and sometimes six hours in a row a new link each time, and there was another one on Webex, and one on Zoom. At that time, it seemed to me that there were a lot of cancellations, and we were always waiting and starting late. (P8)

Or if some classmates aren’t skilled with the program and their microphones stay on, or the camera is on, it’s very difficult to follow if you hear double, or you hear a buzz, or anything in the background. (P15)

3.2. Organization of DBE

Technical issues alone do not mean much. However, they have determined the organization of DBE to a large extent. They represented a pre-limited environment in which the new teaching process was to take place. In such an environment, the technical and human factors meet, which in combination have shaped situations that students have characterized as positive or negative.

As advantages of holding lessons online, students highlighted the possibilities of recording lectures, savings in time and money that would be spent on transportation to the university, comfort at home, and flexibility in carrying out the practical part of lessons, which ought to take place in personal contact with a patient. Here are some examples.

An advantage is that some professors have now allowed lectures to be recorded, which is great for learning because then you then have all the lectures recorded and you can still learn from them. Yeah, I mean, I’d say that’s more of an advantage. (P7)

With distance lectures, I save the time I would otherwise spend driving. (P8)

I would say the biggest advantage was that I was able to follow distance learning fairly smoothly, even though I worked at a retirement home during the first wave of the coronavirus pandemic, so I could combine the useful with the useful. So, a definite advantage is that I can do something else during the lectures and thus save time. (P9)

For example, in the course Family Medicine, instead of going through a live scene with a patient or getting a patient to the clinic, we recorded consultations or conversations with the patient via Webex and then discussed the recording in rehearsals and discussed what was right and what was wrong. It was such an interesting experience. I think it would be better live, but it seems like a good adaptation to the situation. (P2)

In contrast, some students highlighted certain negative features of the organization of DBE. One subjective assessment is that students learn less through distance learning. It should be added that individual interviewees pointed out the lack of clinical experience because the practical part of the lessons suffered the most during the pandemic. An overcrowded schedule was also pointed out as an organizational shortcoming.

It is primarily this lack of being in touch. It seems to me that clinical exercises, say, if you learn about a disease, if you see one patient with that disease, you remember his story, his symptoms, and it really stays with you, like that memory of “aha, that’s an association with him.” But when you try to learn from home, those diseases are all based on the same principle. You see, everything can be very structured, but it doesn’t have such strong memory associations. (P5)

We also lack contact with the patient; we could otherwise go to the UK for exercises, but then we couldn’t. One thing I also just remembered is that we will never learn microscopy really well because we looked at the specimens on the computer. (P10)

Maybe if I point out that in some subjects the schedule is too intensive because often three or even four lectures come one after the other, without a break. (P6)

An important organizational aspect of DBE has been the increased freedom of students to attend certain lectures. Otherwise, students are convinced of the individual need to attend certain lectures, but, on the other hand, the experiences of our interviewees testify to greater freedom and better organization and free time. The expression “flexibility” was used several times. The experiences of some students show that while listening to lectures they ate, exercised, practiced certain hobbies, and studied other things. The students characterized all this as positive in the context of the organization of DBE.

1 In this case, it may be a somewhat biased assessment because lectures can also be recorded at the university.

2 For example, “I’m not satisfied with distance learning because I have the feeling that I’m learning less than in live lessons” (P7).
Now that the lectures are on the internet, I sometimes connect to something I wouldn’t otherwise go to because I only connect on the phone, even if I’m just in the car and listening. I’m fine because you’re not so tied to a place and time, and you can do something else in between. That’s a little more flexible. (P11)

Occasionally I also go for a walk, but just listening to it on the phone is quite fine, especially if the subject doesn’t depend on PowerPoint so much. (P8)

I mean, when I’m productive during lectures, I don’t listen to lectures, then it’s usually just university work, notes, and preparation for another subject. In the meantime, you put the computer on mute and you just study something else. (P9)

3.3. Social exclusion of students

Virtually all the interviewees mentioned social exclusion of one sort or another in their experiences. Sometimes this exclusion referred to the teaching process, and sometimes to the lack of basic human contact with their professors and classmates. The problems associated with social exclusion were mostly related to decreased concentration and learning difficulties. Some interviewees also admitted serious conditions that occurred as a result of social isolation.

I find it a little harder to keep up, after six hours of looking at the computer. You get a lot more exhausted at the end; it’s hard to continue studying and you really need some relief. (P1)

I had all kinds of feelings; I was nervous, then depressed for a while without any will or motivation, and then at some point I was excited that I still had more time and I could process all this information; that’s the way it happened with me too. It seems like as soon as I started doing distance learning I became so lethargic that I was less capable of doing anything than I would have otherwise been if things had been live. (P4)

As a consequence of social exclusion, the interviewees also mentioned that they missed communication, conversation with new people (new students they met at the university), encouragement from colleagues, conversation with friends, and other activities. Some interviewees lacked self-discipline, and others admitted stress and psychological blocks. They attributed everything to the change: that education at the university was replaced overnight by education from home.

There was about a week when there was nothing from you during the exam period; you didn’t do anything, and you didn’t automatically feel any motivation because you were just at home. (P6)

Well, as for my psyche, I’d say. I don’t know if I can speak for the rest; but let’s say a lot of my classmates had a hard time coping with the fact and they just gave up. Before, for example, things at university went well for them, they did a good job, and then, during the exam period, when you have to be at home or you’re studying at a distance, they totally gave up, they didn’t take their exams at all, they did almost nothing during the exam period; they were really depressed, so it seems to me that it had very bad consequences psychologically. (P7)

3.4. Suggestions for improvement

In addition to questions about their experiences of the COVID-19 pandemic, we also asked students in the interviews how they thought DBE could be improved. The answers were grouped into three categories: 1) organization of DBE, 2) communication with peers, and 3) a combination of online and offline teaching.

I know it can be very challenging, but it was better in those subjects where the supervising professor went the extra mile: he mastered the software and he always created a lecture, distributed the lecture, and then there was always a link and always open lectures, and there wasn’t so much of this confusion. This should be better organized. (P13)

I think it will still be something like this; I think it won’t be completely the way it was, but it will still be similar. It’s also the sixth year; they have a little more to do, so it’s even more important to have practical exercises. I think a lot of students dropped out of the practical exercises, and that’s not good, but the lectures and these other things will still be held over the internet in my opinion. (P2)

Lectures may be online, but I miss the discussion between students and professors. (P6)

I could partially keep the way of lecturing online, but I don’t want to replace too many live lectures; I still wish I had more things live.

As a last resort, they highlighted several practical exercises that should take place live. Clinical practice was also considered important for developing self-confidence in treating actual patients. The fear of not being familiar with the actual situations was repeatedly emphasized. Therefore, the students expressed willingness for clinical practice to take place in smaller groups.

Especially when it comes to clinical subjects, it would be better to hold these live. In introductory subjects, for example, with patients it’s difficult to imagine things online; you don’t have a sense of why something is important or why you came up with something. But I hope that we’ll go to the clinic at least as much as our predecessors did; it seems really, really, critical to me for this to be the case. (P2)

In addition to the need for clinical practice, the students interviewed also emphasized the importance of better coordination of schedules, greater computer literacy of lecturers, shortening and simplifying the curriculum, better accessibility of libraries and teaching materials, and responsiveness of lecturers.

4. Discussion

The study identified Slovenian medical students’ experiences with DBE during the COVID-19 pandemic. The findings indicate that students had problems with the technical aspect of DBE (use of communication tools), organization of online lectures, and social exclusion. This is an experience that Slovenian students share with their counterparts abroad (Almendingen et al., 2021; Desai et al., 2020; Di Giacomo & Di Paolo, 2021; Khan et al., 2021; Mishra et al., 2020; Mohammed et al., 2020; Nadaf, 2021; Oloyede et al., 2021; Peimani & Kamalipour, 2021).

A specific technical shortcoming pointed out relates to the Webex application, which does not allow more than 100 users at a time. Therefore, certain students were not able to attend classes, which was an organizational error by the University of Ljubljana’s Medical Faculty. Compared to some poorer countries (Mishra et al., 2020; Oloyede et al., 2021), students in Slovenia were not disadvantaged with regard to internet access. DBE in Slovenia was more impacted by the human factor, which related to poor mastery of software (by both students and professors) and confusion in the use of communication tools. Such confusion also occurred in other countries (Peimani & Kamalipour, 2021), which can primarily be attributed to professors’ lack of preparation and the sudden arrival of the COVID-19 pandemic.

In addition to studies that used a quantitative approach (i.e., a survey) to measure the frequencies of the most common changes caused by relocating education to the online environment (Desai et al., 2020; Di Giacomo & Di Paolo, 2021; Khan et al., 2021; Onyema et al., 2020), our study raised questions that were difficult to anticipate. We were exclusively interested in descriptive responses that were not predetermined by measurement scales (e.g., a five-point Likert scale) for agreement with certain affirmations, as Mohammed et al. (Mohammed et al., 2020) and Almendingen et al. (Almendingen et al., 2021) utilized. In this way, for example, we obtained answers about students’ mental wellbeing and the psychological impact on them (e.g., decreased self-motivation, despair, lack of enthusiasm for studying, or depression) as a result of the transition to DBE.

The findings from our study create a basis for conducting broader quantitative studies focusing on only one segment of DBE. Each of the three main categories, which comprise an inductively formed whole (technical issues, organization, and social exclusion), should be theor-
ically investigated and checked using a larger number of participants. Investigating the impact of COVID-19 on education would fill a gap in studies today regarding education. Such an approach would also make it possible to measure the effects that the transition to DBE had on students because we did not initially anticipate them. Some quantitative studies that used a questionnaire (i.e., a survey) as a research method lack this aspect of research (Di Giacomo & Di Paolo, 2021; Onyema et al., 2020).

In addition to its several strengths, such as student perspective about distance-based education during the COVID-19 pandemic in Slovenia, consistent use of qualitative content analysis, this study also has some limitations. A general limitation of the study is related to epistemological criteria and validity in qualitative research (Schreier, 2012). Although the latter provide a wealth of detail, large-scale representative quantitative surveys are needed to capture a large amount of data and shed more light on student perspective about DBE during the pandemic. Although the number of interviewees seems small, the richness of their testimonies has offered enough information to reach conclusions. To further verify the results, a study among students from another school who have a similar curriculum would be interesting.

Similar to the results of other empirical studies (Desai et al., 2020; Khan et al., 2021; Mohammed et al., 2020), our results indicate that students are able to assess shortcomings and suggest improvements regarding distance learning in the future. Although we designed the questionnaire in such a way that education from home was a prerequisite for the answers, we could not avoid the feeling that students expected the situation to normalize and that they would return to the lecture halls. Because this primarily depends on the course of the COVID-19 pandemic, it is necessary to continue studying the transition to an online environment, which is not a one-time event, but a process that may occur repeatedly.

5. Conclusions

Slovenian medical students’ experiences with DBE during the COVID-19 pandemic mainly revealed shortcomings in lecturers’ computer literacy. To this must be added the confusion created by the use of various tools, which demanded a quick response and ingenuity from students and lecturers in the online environment. Technical issues significantly marked the transition of Slovenian medical students to DBE during the COVID-19 pandemic. This was especially evident in the lack of objective implementation of practical clinical training that suffered the most during the pandemic.

Another important finding that raises many issues that deserve further attention is the consequences of social isolation. Slovenia is not a large country and students do not study far from home. Particularly problematic is the fact that the COVID-19 pandemic in Slovenia has been going on for too long. During the 2 years of the study, students were at home more than two-thirds of this time, which certainly had consequences for their cognitive and mental state. In addition to suggestions for organizational and technical improvement of DBE, in the future more attention therefore needs to be directed to examining students and the hardships they face related to both studying and living in pandemic conditions.

This study represents a springboard for future studies in which the authors will examine DBE in crisis situations. Due to its methodological nature, this study therefore requires further verification of its findings, which will contribute to developing research in this area. This is a long-term process, but only in this way can we assist decision makers and colleagues in academia in carrying out DBE with improved effectiveness and quality.

Availability of data and materials

The datasets generated during and analyzed during the current study are available in the Danica Rotar Pavlic repository.

Authors’ contributions

DRP and AM participated in the design of the study and they trained the interviewers. All authors did the literature review. AE and BU analyzed the transcripts. DRP and AM revised the codes, themes and categories. AE, MKK, DRP and BU participated in drafting the manuscript. All authors read and approved the final manuscript.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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