

Dental students' perceptions of simultaneous live and online OSCEs during the COVID-19 pandemic

Tiina Tuononen¹  | Terhi Karaharju-Suvanto²  | Satu Lahti³  | Hanna Hytönen¹ | Ritva Näpänkangas^{4,5}

¹Institute of Dentistry, Faculty of Health Sciences, University of Eastern Finland, Kuopio, Finland

²Department of Oral and Maxillofacial Diseases, Faculty of Medicine, University of Helsinki, Finland, University Dental Clinic, City of Helsinki, Finland

³Department of Community Dentistry, Institute of Dentistry, University of Turku, Turku, Finland

⁴Research Unit of Oral Health Sciences, Faculty of Medicine, University of Oulu, Oulu, Finland

⁵Medical Research Center Oulu, Oulu University Hospital and University of Oulu, Oulu, Finland

Correspondence

Tiina Tuononen, Institute of Dentistry, Faculty of Health Sciences, University of Eastern Finland, PL 1627, SF-70211 Kuopio, Finland.

Email: tiina.tuononen@uef.fi

Abstract

Introduction: The Objective Structured Clinical Examination (OSCE) is a valid, reliable and reproducible assessment method traditionally carried out as a live examination but recently also provided online. The aim was to compare any differences in the perceptions of dental students participating in online and live OSCE using mixed methods.

Materials and Methods: All Finnish fourth-year undergraduate dental students ($n=172$) attended the exam in April 2021. Due to the COVID-19 pandemic, the official administrative restrictions in teaching in universities still existed in April 2021. By the time of the national OSCE, the pandemic situation varied in different parts of the country. Therefore, two of the universities conducted a live OSCE and two an online version of the OSCE. Data were collected after the OSCE using a voluntary anonymous electronic questionnaire with multiple-choice and open-ended questions (response rate 58%). Differences between the OSCE versions were analysed using the Mann–Whitney U test and open answers with qualitative content analysis.

Results: The students considered both types of OSCE good in general. The main differences were found concerned adequate time allocation and overall technical implementation, in favour of the live OSCE. While a qualitative analysis revealed exam anxiety as the most often mentioned negative issue, overall, comments were positive.

Conclusion: Variation in the assessments between different question entities seemed to be wider than between the implemented OSCE versions. Time management in the OSCE should be further developed by managing the assignment of tasks.

KEYWORDS

assessment, COVID-19, online learning, OSCE, student perceptions

1 | INTRODUCTION

The Objective Structured Clinical Examination (OSCE) based on a set of competencies determined by the Association for Dental

Education in Europe (ADEE)¹ is organised in Finland at the end of the fourth year of dental studies. It is organised simultaneously in all four universities that provide undergraduate dental education in Finland. OSCE is a gateway assessment that provides dental

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2023 The Authors. *European Journal of Dental Education* published by John Wiley & Sons Ltd.

students with an opportunity to work for the first time as dentists in oral health services during the summer (permission to practice dentistry granted by the National Supervisory Authority for Welfare and Health, Valvira in Finnish).²

OSCE is a valid, reliable and reproducible assessment method.³⁻⁶ During the COVID-19 pandemic, the examination has also been offered online⁷⁻¹¹ and virtually using the Zoom teleconferencing software.^{10,12-14} In Finland, an evaluation of the 2020 national online OSCE showed that, overall, student feedback was positive.⁷ Students had positive experiences of technical implementation and the difficulty of the questions. Moreover, the content and usability of the question entities were reported as good. Negative experiences reported by students included difficulties in completing the exam within the time given.

Despite the positive feedback on the online OSCE, it has also been found to have limitations. Due to the limitations of the online OSCE and based on previous evaluations of the live OSCE,¹⁵ all of the universities included in this study intended to conduct a live OSCE in 2021. However, due to fluctuations in the pandemic situation, the universities were also prepared to carry out an online version of the OSCE. By the time of the national OSCE, the pandemic situation varied in different parts of the country. As a result, two of the universities conducted a live OSCE and two an online version of the OSCE.

We were not able to identify previous studies comparing the simultaneous implementation of live and online OSCE. We could also not find studies assessing the differences in student experiences between online and live OSCE implementations. Thus, our aim was to compare any differences in the student perceptions between the online and live OSCE using mixed methods.

2 | MATERIALS AND METHODS

The OSCE was organised simultaneously in all educational institutes providing education in dentistry in Finland (Universities of Eastern Finland, Helsinki, Oulu and Turku) in April 2021. All fourth-year undergraduate dental students ($n=36$ in Eastern Finland, $n=47$ in Helsinki, $n=50$ in Oulu, $n=39$ in Turku, in total $n=172$) attended the exam. OSCE was organised as a live version in the Universities of Helsinki and Oulu, and as an online version in the Universities of Eastern Finland and Turku.

As pre-OSCE information, the students were informed of the procedure and assessment criteria of the OSCE in advance. Voluntary rehearsal tests were provided for the students in both OSCE versions.

The topics of the tasks were similar in both live and online OSCEs (Table 1). The topics of the tasks were shared equally between various disciplines, and the domains of the tested competencies were in line with those specified by the ADEE¹ (Table 1). The live OSCE included 12 task stations, and 10min had been reserved for completing each task (9min for completing the task and 1min for moving on to the next task station). The online OSCE was arranged into 12

separate tasks in the Moodle environment with a 9-min timeframe reserved for completing each task. Similarly, as in the live implementation, the students were asked to complete the tasks one by one in the given order without an option to return to the previous task. The descriptions of the tasks in the live and online OSCEs are shown in the Table 1.

The students performed both the live and online OSCE tasks individually. In the live OSCE, the students were given immediate individual verbal feedback right after the four tasks. In the online OSCE, no immediate feedback was given during the exam, but students were allowed to see the assessment criteria after the exam. A debriefing session was organised after both OSCE versions.

2.1 | Questionnaire

Research data were collected after the OSCE using an anonymous electronic questionnaire with multiple-choice and open-ended questions. A similar questionnaire has been used in an earlier study.⁷ The students were provided with written information about the details of the study and were asked to provide online consent for the use of their replies in the present study. Three questions were used to ask the students about their experiences before the exam using a five-point Likert scale (1=fully disagree, 5=fully agree) for the following statements: (1) I received adequate information about the exam, (2) I had a positive attitude towards the exam and (3) The rehearsal test was useful. Then, the students assessed the OSCE with a four-point Likert scale for its (1) technical implementation and (2) difficulty of the questions (1=poor, 4=excellent), as well as (3) if their education had been sufficient in preparing them to the OSCE (1=completely insufficient, 4=completely sufficient). In addition, two open-ended questions inquired about the positive and negative attitudes the students had towards the OSCE before the exam.

For each task, the students were asked to assess its (1) usefulness, (2) interest, (3) technical implementation and (4) appropriateness of the time reserved for completing it. In addition, open-ended questions were used to ask the students about any positive and negative experiences regarding each task.

Finally, the students were asked to provide suggestions for the development of the OSCE according to the exam version (live/online) they had completed. They were also given an opportunity to give any general comments.

2.2 | Data analysis

Responses to the multiple-choice questions were described using means and standard deviations, first for all participants and subsequently separately for the live and online OSCE groups. In addition, individual sum scores describing the usefulness, interest, technical implementation and appropriate time allocation were calculated for all tasks, first among all participants and then in the live and online

TABLE 1 Task entities in live and online OSCEs described based on task topics, task descriptions and related ADEE domain competencies tested in each task.

Topic of the task	Description of the task		ADEE domain ^a
	Live	Online	
1 Endodontics/ diagnostics of pain	Pain diagnostics in region d 36 based on anamnestic information and clinical findings and treatment options for acute pain	Choose the right diagnosis and the treatment options from the given answer option lists and explain them to the evaluator	II, III
2 Aseptic practice	Preparing and dismantling the anaesthetics syringe using good aseptic practice	Demonstrate preparing and dismantling the anaesthetics syringe using good aseptic practice	I, II
3 Pedodontics	Making a diagnosis about toothache based on an interview of a child and his/her parent	Interview of the evaluator who is acting a parent with a photo of a child	I, II
4 Cariology filling	Choosing the right matrix band and placing it correctly over a prepared cavity	Choose the right matrix band for an upper molar from the given bands and demonstrate the placing over a prepared cavity in phantom head	II
5 Emergency	Treatment of the temporomandibular joint dislocation (open lock) caused during the cavity preparation and the provision of information for the aftercare	Demonstrate and explain the treatment of an open lock with a phantom head to the evaluator. Explain the information about the aftercare	II, III
6 Oral surgery	Treatment of prolonged bleeding after tooth extraction	Explain to the evaluator the treatment of prolonged bleeding after tooth extraction	II
7 Orthodontics	Orthodontic treatment plan after untimely extraction of a deciduous molar	Choose the best option from the given answer options and justify the answer to the evaluator	III
8 Periodontology	Diagnostics based on clinical and radiological findings and related patient information	Tell the periodontal diagnosis to the evaluator, (acting as a patient), based on clinical and radiological findings and related patient information. Tell the evaluator/patient the key things about the illness, aetiology and the treatment	III, IV
9 Prosthetic dentistry and stomatognathic physiology	Information for the patient about the anatomy and function of the discus dislocation in the temporomandibular joint and the provision of instructions for self-care	Draw a picture of the discus dislocation in the temporomandibular joint and explain the incident to the actor patient. Explain the procedure for self-care	II, III
10 Public dental health	Filling out patient documents after a dental appointment according to legislation in case of power cut	Write the patient documentation according to legislation based on the given written information and photo of the materials used	I
11 Oral pathology Oral medicine	The treatment plan for a lesion on oral mucosa based on the anamnestic information and clinical findings	Choose the four most important treatment options based on the anamnestic information and clinical findings	II, III
12 Oral radiology	Analysing the quality of an intraoral radiograph and planning measures needed for improving quality	Written essay on the mistakes in the quality of given periapical x-ray image and measures needed for improving quality	II

^aI, professionalism; II, safe and effective clinical practice; III, patient-centred care; IV, dentistry in society.

groups. In addition, the sums of all the four variables were calculated for all tasks. Statistical significances between the means of the live and online groups were calculated using the Wilcoxon signed rank test. Data were processed with the IBM SPSS Statistics (version 27) statistical software.

The responses to the open-ended questions were analysed with content analysis.¹⁶ First, two of the authors read the open-ended responses independently and prepared a preliminary grouping. Subsequently, the authors categorised expressions (word, phrase, sentence) with similar content to describe the most commonly mentioned expressions contained by the responses to each open-ended question based on the two examination groups. Example quotes from the open responses are shown alongside the results to describe the grouping process.

3 | RESULTS

Of all 172 OSCE participants, 113 (66%) filled out the questionnaire and 99 (58%) gave permission to the use of their answers in this study. Of the study participants 79% ($n=78$) were female, 20% ($n=20$) were male and 1% ($n=1$) selected the alternative 'other'. The mean age of the study participants was 27 years (SD 4.3 years, range 23–51 years).

The response rates in the universities were 50% in Eastern Finland, 45% in Helsinki, 80% in Oulu and 51% in Turku. Of the study participants, 61 (62%) took part in the live OSCE and 38 (38%) in the online OSCE.

Compared to the online OSCE participants, those who took part in the live OSCE agreed more often with the statement that they had received adequate information before the OSCE and they also rated the overall technical implementation of the OSCE higher than the online participants (Table 2). The live OSCE participants rated the level of the difficulty of the questions higher than the online OSCE participants. However, the online OSCE participants rated the sufficiency of the teaching they had received during their studies in relation to the OSCE slightly higher compared to the live OSCE participants (Table 2).

The students' assessments of the usefulness, interest, technical implementation and appropriate allocation of time for each task are presented in Table 3. In the overall assessments, the views of the

participants of the live and online OSCEs differed most in relation to the appropriate allocation of time, in favour of the live version. The online version was assessed to have fared better in technical implementation. There was more variation in the assessments of different question entities compared to the two OSCE version implementations.

3.1 | Open responses

Based on the students' open responses, both versions of the OSCE stirred up positive thoughts before the exam. The students valued the opportunity to test their skills and knowledge in clinical matters, which enhanced their preparedness for clinical practice.

- *It's good to get to test your level of skills and competence in a stressful situation.* (live)
- *An exam is a learning situation and good practice for the summer.* (live)
- *I was expecting an exam that would test my clinical skills, and boost my confidence related to my upcoming summer job.* (online)

The live version of the OSCE was particularly well-liked, as it provided an opportunity to take the exam as a live event, but some students favoured the online implementation.

- *It was nice to know that you can take a live exam.* (live)
- *As such, it was nice that you could take the exam remotely as it allows you to get rid of the extra pressure caused by a live situation* (online)

The most common negative item described before the exam was exam anxiety, but some students also mentioned stress as a positive factor.

- *I had quite a lot of pressure about OSCE, as I tend to get anxious.* (live)
- *You get to test what you have learned under pressure* (live)
- *I was pretty nervous beforehand and was afraid that if I fail too many stations, it may endanger my chances of getting a summer job.* (online)

TABLE 2 Results of the statements (mean and standard deviation SD) concerning the situation before the OSCE, the difficulty and implementation of the examination and teaching related to the examination topics.

Statements	Scale (reply alternatives)	All	Live	Online	p (Mann-Whitney U)
I received adequate information before the exam	1 = fully disagree to 5 = fully agree	4.3 (0.8)	4.5 (0.5)	4.0 (0.9)	.003
I had a positive attitude towards the exam before the exam		3.8 (0.8)	3.8 (0.9)	3.8 (0.7)	.859
I found the rehearsal test useful		3.6 (1.1)	3.5 (1.1)	3.6 (1.0)	.770
The difficulty of the questions in the OSCE	1 = poor to 4 = excellent	3.1 (0.8)	3.3 (0.6)	2.7 (0.8)	.001
The technical implementation of the OSCE		2.9 (0.7)	3.1 (0.5)	2.5 (0.8)	.000
The teaching I have received during the studies in relation to the OSCE was	1 = completely insufficient to 4 = completely sufficient	3.1 (0.5)	3.0 (0.4)	3.2 (0.5)	.010

Note: Statistical differences were analysed using the Mann-Whitney U test.

TABLE 3 Student assessment (mean, standard deviation SD) on the variables of usefulness, interest, technical implementation and appropriate time allocation to each question entity (1 = poor, 4 = excellent).

Question entities	Usefulness			Interest			Technical implementation			Appropriate time allocation		
	All	Live	Online	All	Live	Online	All	Live	Online	All	Live	Online
	1	3.2 (0.8)	3.4 (0.8)	3.0 (0.9)*	3.2 (0.8)	3.6 (0.9)	3.0 (0.6)*	3.1 (0.8)	3.1 (0.8)	3.0 (0.8)	3.2 (0.9)	3.5 (0.7)
2	3.6 (0.6)	3.7 (0.5)	3.3 (0.7)**	3.4 (0.7)	3.6 (0.6)	3.0 (0.7)***	3.1 (1.1)	3.7 (0.5)	2.0 (1.0)***	3.4 (1.0)	3.6 (0.8)	3.0 (1.0)***
3	3.8 (0.6)	3.7 (0.5)	3.8 (0.7)	3.6 (0.7)	3.6 (0.7)	3.7 (0.7)	3.4 (0.8)	3.2 (0.9)**	3.7 (0.6)	3.8 (0.6)	3.9 (0.5)	3.7 (0.8)
4	3.5 (0.7)	3.4 (0.7)*	3.7 (0.6)	3.4 (0.8)	3.3 (0.9)	3.5 (0.7)	3.0 (1.0)	2.8 (0.8)*	3.1 (1.1)	3.5 (0.8)	3.7 (0.7)	3.1 (0.9)**
5	3.5 (0.7)	3.4 (0.8)	3.6 (0.6)	3.3 (0.7)	3.3 (0.7)	3.4 (0.6)	2.6 (1.0)	2.7 (1.0)	2.5 (1.1)	2.6 (1.0)	2.9 (1.0)	1.2 (0.5)***
6	3.6 (0.6)	3.5 (0.6)	3.6 (0.6)	3.4 (0.7)	3.4 (0.8)	3.5 (0.6)	3.5 (0.7)	3.4 (0.7)	3.6 (0.6)	3.6 (0.7)	3.8 (0.4)	3.4 (0.9)**
7	3.2 (0.8)	3.0 (0.9)*	3.4 (0.6)	3.0 (0.8)	2.9 (0.8)	3.1 (0.8)	3.1 (0.8)	3.0 (0.8)*	3.4 (0.8)	3.4 (0.6)	3.5 (0.7)	3.3 (0.6)
8	3.6 (0.6)	3.6 (0.5)	3.6 (0.7)	3.4 (0.9)	3.5 (0.8)	3.3 (0.9)	3.1 (0.8)	3.1 (0.8)	3.0 (0.8)	3.0 (1.0)	3.5 (0.7)	2.1 (0.9)***
9	3.4 (0.7)	3.5 (0.8)	3.3 (0.7)	3.3 (0.8)	3.3 (0.8)	3.2 (0.8)	3.6 (0.7)	3.5 (0.7)	3.7 (0.7)	3.8 (0.5)	3.8 (0.6)	3.9 (0.2)
10	3.0 (0.9)	3.0 (0.9)	3.0 (0.9)	2.9 (0.8)	2.8 (0.8)	2.9 (0.8)	2.3 (0.9)	2.4 (1.0)	2.1 (0.9)	1.8 (1.0)	1.9 (1.1)	1.3 (0.8)
11	3.8 (0.6)	3.8 (0.5)	3.7 (0.7)	3.6 (0.7)	3.6 (0.8)	3.8 (0.4)	2.6 (1.1)	2.5 (1.2)	2.8 (0.9)	2.6 (1.2)	3.2 (1.0)	1.6 (0.8)***
12	3.5 (0.7)	3.4 (0.8)	3.7 (0.5)	3.4 (0.6)	3.3 (0.7)	3.6 (0.5)	3.0 (1.0)	2.7 (1.0)***	3.6 (0.7)	3.8 (0.5)	3.7 (0.5)	3.9 (0.4)
Sum total	3.5 (0.3)	3.5 (0.3)	3.5 (0.3)	3.5 (0.3)	3.3 (0.4)	3.4 (0.4)	3.0 (0.4)	3.0 (0.4)	3.1 (0.4)	3.2 (0.5)	3.4 (0.3)	2.8 (0.4)***

Note: Statistical differences are analysed with Mann–Whitney *U* test.

* $p < .05$ ** $p < .01$ *** $p = .00$.

- *Based on what I've heard from more advanced students, I was under the expression that most found that OSCE was a pretty fun exam even though it's quite nerve-wracking.* (online)

Uncertainty related to one's personal skills and knowledge and time pressure were also often mentioned by the students for both exam versions.

- *Nervousness about whether I'll know what to do and know how to do things* (live)
- *A fear of failure if you are presented with an assignment and have no idea of how to tackle it* (live)
- *I was worried about time use at the stations* (online)

For both versions, some students commented that it was unfair that the exam was not taken in the same way across the country.

- *The consistent implementation of the exam, as the exam was live in some cities and on Moodle in others* (live)
- *Giving some students the opportunity to take the exam remotely put us in an unequal position...* (live)
- *I was maybe a little surprised to find out that the exam was taken live in some cities and on Moodle in others.* (online)

The students' worries related to the live OSCE were concerned with the clinical scenarios played out in the task stations; meanwhile, those participating in the online OSCE were worried about technical issues related to the online exam.

- *... I was worried that I'd freeze in one of the stations.* (live)
- *What if the technology fails?* (online)

The students' development ideas for the live OSCE included more practice-oriented tasks and less writing as well as receiving more direct feedback. The online OSCE students wished for more variety in the tasks, as they felt that writing their responses had taken too much time and created additional stress.

- *You could easily increase the amount of direct feedback we get in the stations...* (live)
- *Either give us more time to write essays or make the assignments less extensive...* (online)
- *...producing written text takes up more time than speaking about the matter, and the situation guides your process effortlessly* (online)

The general comments by the students were positive. The students in both groups described OSCE as a good exam testing important issues. Students in both groups also liked the debriefing after the exam.

- *The exam situation was enjoyable and good for learning!* (live)
- *Overall, it was a pretty good experience and a kind of a tradition for us dentistry students.* (live)

- *The feedback session held after OSCE was particularly useful, involving discussing the assignments and considering them together with others* (live)
- *But it was pretty good for learning and the debriefing session was a pretty good learning session.* (online)
- *Overall, it was a good exam.* (online)
- *It was good overall, even though it was quite an effort on such a tight timetable.* (online)

The live OSCE was widely well-regarded as it provided an opportunity to take the live exam during the pandemic, but the structure of some of the tasks was considered to be poor.

- *I loved that we could take the exam live!!* (live)
- *I'm upset that we had to organise OSCE remotely.* (online)
- *This remote version was also nice.* (online)
- *Moodle OSCE is a workable solution in the current epidemic situation and I think it does a good job in measuring competence.* (online)

4 | DISCUSSION

Overall, the students considered both the live and online OSCE as good. The main difference between the two implementations was found in the adequacy of the time allocated to the exam, in favour of the live OSCE. There was greater variation in the student's opinions regarding different question entities than between the implemented OSCE versions. Our qualitative analysis revealed that exam anxiety was the most often mentioned negative issue, but, overall, the students' comments were positive.

The time allocated for the exam was assessed to be at a poorer level for the online OSCE compared to the live implementation in 7/12 tasks. Similarly, in their open-ended responses, many students commented on the allocation of time the online OSCE. Based on the experiences in the modified OSCE 2020,⁷ the structure of the online OSCE in 2021 was changed to involve separate 9-min tasks instead of a single exam carried out for a certain total duration, which made the students responsible for managing the time spent on specific tasks. The online OSCE participants reported that writing answers to the tasks took too much time and created additional stress, as it takes a lot more time to write down the answers compared to telling them to assessors in a live OSCE. The students also wished for more variety in the tasks. The same tasks cannot be used in the live and online exam despite covering the same core subjects, and the individual advantages of both test formats should be taken into account. Therefore, the structure of the tasks in the online exam should be strictly planned and modified considering the technical properties of the used online platform.

As the COVID-19 pandemic had prolonged, the 2021 OSCE was already originally planned to include both live and online implementation, taking advantage of the experiences gathered from using a modified online OSCE in 2020.⁷ The students in both groups felt that OSCE is a good exam testing important issues. In particular, the

students in the live OSCE valued the opportunity to test their skills and knowledge in clinical tasks, but some students also favoured the online OSCE. However, both groups commented that they found it unfair that the examination was not carried out identically across the whole country.

Exam anxiety was the most often mentioned topic in the students' negative comments. Those participating in the live OSCE worried about how they would manage the clinical scenarios in the test stations, while those participating in the online OSCE were anxious about technical issues. Exam anxiety has also been reported in previous literature.¹⁷ Although students participating in both of the OSCE versions made reference to uncertainty related to their personal knowledge and skills in addition to time pressures, some students also mentioned stress as a positive factor. It seems that some students view stress as something that motivates them and pushes them to do their best, while some feel that exam anxiety hinders their thinking and makes performing tasks more difficult than the same situation would be in real life. The students participating in the live OSCE valued the immediate feedback they received, which they suggested could be utilised even more. The debriefing session was valued by both student groups. Therefore, the OSCE can be considered as a test of performance under pressure that is carried out under supervision in a safe environment and as a test that involves receiving feedback and, through this, also learning from the situation.

Several suggestions for the development of OSCE were received from the students. Most comments concerning the live OSCE suggested that the stations should be fully clinical instead of requiring writing. This year, more written tasks were used in the live examination, most likely in an effort to keep the live and online exams as identical as possible, and the live OSCE contained more written tasks than previously.

Compared to the 2020 online OSCE, the number of tested question entities increased, but the test was not made to include an oral exam section even though this option was previously discussed. Positive experiences have been previously gathered from a virtual OSCE (VOSCE) using Zoom teleconferencing software^{10,12,13} in which the breakout room feature in Zoom is used to represent the OSCE stations.¹³ Zoom enables the assessment of verbal communication, including the students' medical knowledge and decision-making, and participants have found the features of Zoom beneficial for this purpose.¹³ However, an online OSCE is not a clinical examination and has limitations related to the assessment of clinical procedures. In addition, the disadvantages of implementing an OSCE in Zoom have been reported to include the need for considerable planning and preparation due to the online format and the complicated logistic arrangements required by the use of breakout rooms.^{12,13} Nevertheless, students appreciate the use of the OSCE formal assessment as part of their teaching¹⁸ and in any case, the online version is cost-effective and can be used to supplement face-to-face training.¹⁹

The strengths of the study include the rather good response rate (58%), previously tested questionnaire and independent qualitative analysis by two persons. A limitation of the study was that

each student only completed one type of exam, which made it impossible to compare the live and online exams at the individual level. However, the student groups taking each type of examination were large and equal enough for making comparisons.

The online OSCE is not the original OSCE, which is a clinical examination to test 'show how', and for example communication cannot be tested in written online format. However, the experiences from online OSCEs help to supplement or replace part of the tasks, if needed. In addition, an extra online test can supplement the assessment of clinical tasks in OSCE with more theoretical assessment. With this kind of national assessment, the proceeding in assessing the national and European learning outcomes will be completed.

In conclusion, there was greater variation in the perceptions concerning individual tasks than in the implemented OSCE versions. There is a need to further develop the allocation of time in the examination by managing the assignment of the OSCE tasks.

FUNDING INFORMATION

None.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Tiina Tuononen  <https://orcid.org/0000-0001-6589-1498>

Terhi Karaharju-Suvanto  <https://orcid.org/0000-0003-1228-6862>

[org/0000-0003-1228-6862](https://orcid.org/0000-0003-1228-6862)

Satu Lahti  <https://orcid.org/0000-0003-3457-4611>

REFERENCES

- Field JC, Cowpe JG, Walmsley AD. The graduating European dentist: a new undergraduate curriculum framework. *Eur J Dent Educ.* 2017;21(1):2-10.
- Act on Health Care Professionals 559/1994. Accessed August 2, 2022. https://www.finlex.fi/fi/laki/kaannokset/1994/en19940559_20110312.pdf
- Harden RM, Gleeson FA. Assessment of clinical competence using an objective structured clinical examination (OSCE). *Med Educ.* 1979;13:41-54.
- Manogue M, Brown G. Developing and implementing an OSCE in dentistry. *Eur J Dent Educ.* 1998;2(2):51-57.
- Brown G, Manogue M, Martin M. The validity and reliability of an OSCE in dentistry. *Eur J Dent Educ.* 1999;3:117-125.
- Schoonheim-Klein ME, Habets LL, Aartman IH, van der Vleuten CP, Hoogstraten J, van der Velden U. Implementing an Objective Structured Clinical Examination (OSCE) in dental education: effects on students' learning strategies. *Eur J Dent Educ.* 2006;10(4):226-235.
- Hytönen H, Nöpänkangas R, Karaharju-Suvanto T, et al. Modification of national OSCE due to COVID-19—implementation and students' feedback. *Eur J Dent Educ.* 2021;25(4):679-688. doi:10.1111/eje.12646 Epub 2020.

8. Boursicot K, Kemp S, How Ong T, et al. Conducting a high-stakes OSCE in a COVID-19 environment. *Med Ed Publish*. 2020;9(1):11-18. doi:[10.15694/mep.2020.000054.1](https://doi.org/10.15694/mep.2020.000054.1)
9. Alshammari E. Implementing eOSCE during COVID-19 lockdown. *J Adv Pharm Educ Res*. 2020;10(1):174-180.
10. Kakadia E, Chen E, Ohyana H. Implementing an online OSCE during the COVID-19 pandemic. *J Dent Educ*. 2021;85(S1):1006-1008. doi:[10.1002/jdd.12323](https://doi.org/10.1002/jdd.12323)
11. Quinn B, Field J, Gorter R, et al. COVID-19: the immediate response of European academic dental institutions and future implications for dental education. *Eur J Dent Educ*. 2020;24(4):811-814.
12. Donn J, Scott JA, Binnie V, Bell A. A pilot of a virtual objective structured clinical examination in dental education. A response to COVID-19. *Eur J Dent Educ*. 2021;25(3):488-494. doi:[10.1111/eje.12624](https://doi.org/10.1111/eje.12624)
13. Hannan TA, Umar SY, Rob Z, Choudhury RR. Designing and running an online objective structured clinical examination (OSCE) on zoom: a peer-led example. *Med Teach*. 2021;43(6):651-655. doi:[10.1080/0142159X.2021.1887836](https://doi.org/10.1080/0142159X.2021.1887836)
14. Shehata MH, Kumar AP, Arekat MR, et al. A toolbox for conducting an online OSCE. *Clin Teach*. 2021;18(3):236-242. doi:[10.1111/tct.13285](https://doi.org/10.1111/tct.13285)
15. Näpänkangas R, Harila V, Lahti S. Experiences in adding multiple-choice questions to an objective structural clinical examination (OSCE) in undergraduate dental education. *Eur J Dent Educ*. 2012;16:146-150.
16. Elo S, Kyngäs H. The qualitative content analysis process. *J Adv Nurs*. 2008;62(1):107-115.
17. Brand HS, Schoonheim-Klein M. Is the OSCE more stressful? Examination anxiety and its consequences in different assessment methods in dental education. *Eur J Dent Educ*. 2009;13(3):147-153.
18. Puryer J. Dental undergraduate views of objective structured clinical examinations (OSCEs): a literature review. *Dent J*. 2016;4(1):6.
19. Gormley GJ, Johnston J, Thonson C, Mcglade K. Awarding global grades in OSCEs: evaluation of a novel eLearning resource for OSCE examiners. *Med Teach*. 2012;34(7):587-589.

How to cite this article: Tuononen T, Karaharju-Suvanto T, Lahti S, Hytönen H, Näpänkangas R. Dental students' perceptions of simultaneous live and online OSCEs during the COVID-19 pandemic. *Eur J Dent Educ*. 2024;28:408-415. doi:[10.1111/eje.12962](https://doi.org/10.1111/eje.12962)