

REVIEW ARTICLE

# Implementation of virtual OSCE in health professions education: A systematic review

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## Abstract

**Introduction:** The Objective Structured Clinical Examination (OSCE) has been widely used in health professions education since the 1970s. The global disruption caused by the COVID-19 pandemic restricted in-person assessments and medical educators globally sought alternative means to assess and certify students and trainees to meet the acute demand for health-care workers. One such solution was through virtual OSCE (vOSCE), which modified traditional in-person OSCE using videoconference platforms. This meta-ethnography sought to synthesise qualitative literature on candidates' and assessors' experiences of vOSCE to evaluate whether it may have a role in future assessment practices.

**Methods:** In June 2022, we systematically searched PsycINFO, Medline and ERIC for peer-reviewed qualitative and mixed-methods articles that described candidates' and assessors' experiences of virtual OSCE in health professions education. Of 1069 articles identified, 17 were synthesised using meta-ethnography.

**Results:** The final synthesis represented 1190 candidates and assessors from faculties of medicine, dentistry, nursing, pharmacy and osteopathy. We developed our findings into four key concepts. 'Strengthening confidence in a virtual environment' highlighted attempts to overcome and mitigate concerns associated with transitioning from in-person to virtual assessment. 'Understanding the scope of use as an assessment' reflected on the suitability of vOSCE in assessing various skills. 'Refining operational processes' emphasised the technical challenges of implementing vOSCE and impacts on accessibility and resources. 'Envisioning its future role' considered the applicability of vOSCE in the climate of rapid development in telehealth.

**Conclusion:** This meta-ethnography highlighted that although vOSCE was primarily considered a temporary and crisis response, candidates and assessors recognised positive, as well as negative, consequences of the transition towards them. Moving forward, medical education policymakers should carefully consider the extent to which elements of vOSCE could be incorporated into assessment systems, particularly in light of the rise of telehealth in clinical practice.

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## 1 | INTRODUCTION

The global disruption caused by the COVID-19 pandemic has no parallel in modern times and extended across all major sectors of life.<sup>1</sup> It was clear that it would have a profound impact on health professions education from early in the crisis. The high stakes nature of medical practice means that assessments have always been a crucial component of medical education,<sup>2</sup> and the acute demand for health-care workers meant that certification was a particularly important policy focus.<sup>3</sup> Educators were quick to respond to, reflect on, and evaluate its widespread impacts.<sup>4-6</sup> They had to find alternative means to assess students in a way that would not pose a risk to them, their teachers and examiners, and any patients or simulated patient actors. Such changes in assessments would require fresh and radical thinking prompted by a disaster response mindset.<sup>7-9</sup>

First described in the 1970s, the Objective Structured Clinical Examination (OSCE) is a form of in-person practical assessment that includes structured stations with standardised candidate tasks and examiner marking schemes.<sup>10</sup> It has become a popular assessment in health professions education and beyond for many reasons.<sup>11</sup> It resonated with the dominant ideas of its time, including a preoccupation with competence and on psychometry.<sup>12</sup> Despite some critiques, it has been ubiquitously incorporated into modern 'systems'<sup>13</sup> and 'programmes'<sup>14</sup> of assessment.

During the COVID-19 pandemic, one of the key restrictions imposed was minimising in-person engagements and encounters, and shifting to virtual communications, wherever possible.<sup>15</sup> A virtual OSCE (vOSCE), which applies the same approach to the OSCE but through an online videoconference platform, emerged as a temporary replacement.<sup>16</sup> It has been praised for minimising travel and improving performance.<sup>17</sup> However, the importance of clear and regular communication with students has been emphasised as critically important to its implementation.<sup>18</sup> There have also been concerns raised about its potential to allow cheating<sup>19</sup> and the possibility of disadvantaging students with more challenging home circumstances.<sup>7</sup>

The most fundamental aspect of establishing validity of OSCEs is authenticity of the content.<sup>11,20</sup> It has been noted, for example, that there are challenges in assessing non-technical competencies such as professionalism through OSCEs, which limits how well the test performance extrapolates to real-world performance.<sup>21</sup> It has also been suggested that the use of standardised encounters and patients in OSCEs is too 'artificial' causing trainees to 'pretend empathy' in order to make the grade,<sup>22</sup> pursuing what Bleakley<sup>23</sup> described as 'a compulsive focus on the medical agenda'. Much of the work that has sought to refine and improve OSCEs has therefore focussed on making it realistic to true clinical practice.<sup>24,25</sup> This has been particularly important in relational specialties such as psychiatry<sup>26</sup> and acute specialties such as emergency medicine.<sup>27</sup> Attempts to enhance authenticity in OSCEs have shown positive results. A Swiss study showed that makeup artistry helped enhance the visual realism of simulated patients as octogenarians in a

geriatrics OSCE.<sup>28</sup> Likewise, a Korean study showed that an OSCE station with a higher degree of authenticity better detected medical student level of patient centredness.<sup>29</sup> As such, the major change in format from traditional OSCE to vOSCE represents a fundamental threat to its effectiveness as an assessment tool if assessors and candidates did not find it to be authentic.

Despite an explosion of research about the impacts of COVID-19, there is a lack of coherent synthesis about lessons that can be learnt as the world emerges from the pandemic and grapples with important questions about which innovations should be retained and which should be dropped.<sup>30,31</sup> This study therefore took a broad view to identify and synthesise experiences of vOSCEs from candidates and assessors in health professions education.

## 2 | AIM

Given that vOSCE represents a fundamental threat to the authenticity of the OSCE, and that many schools and programmes around the world are reflecting on the extent to which they may have a role in future assessment practices, this study seeks to evaluate experiences with this assessment approach in a systematic, rigorous and interpretive manner.

The research question guiding this study is *What are candidates' and assessors' (including faculty members) experiences of virtual OSCE in health professions education?*

## 3 | METHODOLOGY

Although quantitative evidence synthesis approaches such as meta-analysis have been widely used and revered, qualitative evidence synthesis approaches have also been recognised as an important approach to advance interpretation as they make a "key contribution [of] deepening understanding".<sup>32</sup> Just like qualitative research methodologies, these exist on a continuum between objectivist and subjectivist orientations to provide broad insights in health professions education.<sup>33</sup>

Meta-ethnography is one such form that can help to organise and synthesise findings from qualitative studies. It is a method first described by Noblit and Hare in the context of educational research and seeks to translate studies into one another.<sup>34</sup> By following Noblit and Hare's steps of conducting meta-ethnography, we interpreted results of individual studies and created a new concept through understanding and transferring ideas across these different studies. Previous evaluations of meta-ethnography have suggested that it is more likely to result in conceptual development and foster theoretical advance than is a conventional narrative literature review.<sup>35</sup> This aspect of mutual translation distinguished meta-ethnography from more traditional methods of literature review and has therefore been widely used in health professions education.<sup>36-38</sup>

### 3.1 | Selection of studies for inclusion<sup>34,36–39</sup>

Three databases (PsycINFO, MEDLINE and ERIC) were systematically searched for articles in June 2022. The search terms and strategies used in each database are listed in Table 1. ‘Snowballing’ was used to find relevant studies; ‘forward snowballing’ involved searching for studies that have cited the eligible articles and ‘backward snowballing’ involved checking the reference lists of eligible articles.<sup>40</sup> Forty-one records were identified from snowballing (Figure 1). Ten additional records were identified from manual searching. The article selection process is summarised in a flowchart (Figure 1) based on the Preferred

**TABLE 1** Search strategy used for PsycINFO, MEDLINE and ERIC.

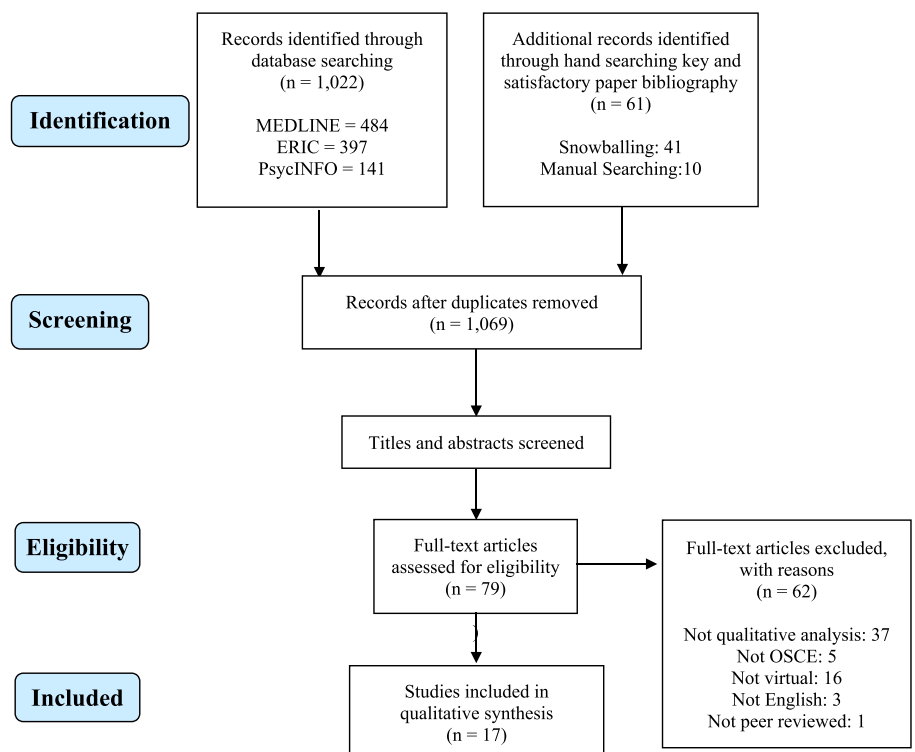
Database	Search strategy
PsycINFO	(virtual OR online OR digital OR remote OR electronic) OR video OR web) AND (OSCE OR ‘objective structured clinical examination’ OR ‘clinical examination’ OR ‘clinical assessment’ OR ‘clinical skill assessment’) AND (interview OR ‘focus group’ OR transcript OR qualitative)
MEDLINE	(virtual OR online OR digital OR remote OR electronic) OR (video OR web) AND (OSCE OR ‘objective structured clinical examination’ OR ‘clinical examination’ OR ‘clinical assessment’ OR ‘clinical skill assessment’) AND (interview OR ‘focus group’ OR transcript OR qualitative)
ERIC	(virtual OR online OR remote) AND (OSCE OR ‘objective structured clinical examination’) AND (qualitative)

Reporting Items for Systematic Reviews and Meta Analyses (PRISMA).<sup>41</sup>

After the removal of duplicates, all 1069 identified records were screened using titles and abstracts by two reviewers (SCCC and GC). The discrepancies in selection were discussed with a third reviewer (MAR). There were no limitations in terms of publication year. Studies excluded at this stage mostly did not use qualitative methodologies or focus on vOSCE. Full texts were obtained for 79 selected abstracts and assessed for inclusion by three reviewers (SCCC, GC and MAR). Seventeen articles met the defined inclusion criteria and were included in the meta-ethnography. The final inclusion and exclusion criteria are detailed in Table 2. Studies were included if they described their methods as qualitative and involved the collection, analysis or interpretation of non-numerical data.<sup>42</sup> Studies examining any implementation of vOSCE, including for formative or summative purposes, were included. However, studies were excluded if they were conducted in a hybrid approach, such as having in-person candidates with remote examiners in order to exclusively examine candidates' and assessors' virtual experiences. Furthermore, studies were excluded if the examination process was asynchronous as their participatory experiences may differ significantly; for example, we excluded candidates self-recording and uploading videos of clinical assessments.

### 3.2 | Critical appraisal

There has been a debate on the value of appraisal in qualitative syntheses, with some authors opting to judge articles exclusively on their conceptual contribution.<sup>43</sup> However, to maintain rigour and



**FIGURE 1** PRISMA flow chart of article selection for the meta-ethnography. OSCE, Objective Structured Clinical Examination; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta Analyses.

transparency for our synthesis, all included articles were appraised independently by two reviewers (SCCC and MAR) using the Critical Appraisal Skills Programme (CASP) qualitative research checklist.<sup>44</sup> This checklist aims to ensure that any articles with poor methodology are excluded in the synthesis. As all 17 articles scored between 55% and 95% on the CASP checklist,<sup>44</sup> no articles were excluded on the grounds of poor quality (<50%).

Using the criteria set out by Dixon-Woods et al.,<sup>45</sup> the 17 articles were also assessed according to their relevance to our research question. Articles were classified as either a 'Key Paper' (KEY)—where its content closely mirrored our research question—or a 'Satisfactory Paper' (SAT)—where its content provided a smaller contribution to our synthesis. After discussion in our data clinic, all four reviewers (SCCC, GC, JK and MAR) agreed to assign one article as KEY and the remaining 16 articles as SAT with no discrepancy. Their classification is presented in Table 3.

**TABLE 2** Selection criteria used to guide screening of articles.

Inclusion
1. Qualitative methodology (including mixed-method studies)
2. Participants included candidates or faculty within health professions education programmes
3. Evaluating a virtual examination (both students and assessors are in front of a screen synchronously)
4. Published in peer-reviewed journal
5. Published in English
6. Published anytime

**TABLE 3** Characteristics of articles included in the meta-ethnography.

First author, Year	Sample group and size <sup>a</sup>	Methods	Country	Relevance	Article
Areat, 2022	6 Faculty members, 124 medical students	Interview, Survey	Bahrain	SAT	46
Donn, 2022	10 Faculty members, 14 dental students	Focus group	United Kingdom	KEY	47
Hay, 2013	40 Medical students	Interview	Australia	SAT	48
Hegazy, 2021	100 Medical educators	Meeting discussion	MENA Region <sup>b</sup>	SAT	49
Hsia, 2021	17 Faculty members, 96 Pharmacy students	Survey	United States	SAT	50
Hytönen, 2021	119 Dental students	Survey	Finland	SAT	51
Kelly, 2021	34 Physical Medicine and rehabilitation residents	Survey	Canada	SAT	52
Langenau, 2014	59 Osteopathic resident physicians	Survey	United States	SAT	53
Luke, 2021	12 Faculty members, 76 Nurse practitioners	Survey	United States	SAT	54
Mak, 2022	22 Pharmacy students	Interview	Australia	SAT	55
Palmer, 2015	9 Medical students	Interview	United States	SAT	56
Phillips, 2020	22 Nurse practitioners	Survey	United States	SAT	57
Roman, 2022	89 Nursing students	Focus group	Spain	SAT	58
Saad, 2022	23 Medical Students	Focus group	Australia	SAT	59
Savage, 2021	156 Pharmacy students	Self-evaluation, Reflection	United States	SAT	60
Shorbagi, 2022	51 Faculty members, 61 Medical students	Survey	United Arab Emirates	SAT	61
Thampy, 2022	32 Examiners, 18 students	Survey	United Kingdom	SAT	62

<sup>a</sup>The reviewers made their best interpretations from articles without specific description of the sample groups and sizes.

<sup>b</sup>The MENA region in the article included the following participating Middle Eastern and North African countries: Egypt, Bahrain, Iraq, KSA, Kurdistan, Libya and Sudan.

### 3.3 | Synthesis

The 17 included studies were synthesised using a meta-ethnographic approach. Firstly, the studies were independently evaluated by four researchers (SCCC, GC, MAR, JK) to extract direct quotations from research participants, known as 'first-order constructs' by Noblit and Hare.<sup>34</sup> Subsequently, the researchers compiled the 'second-order constructs', which were the authors' interpretations of these quotations from the original studies' results and discussion sections. The researchers then came together to formulate their interpretations of first- and second-order constructs, known as the 'third-order constructs'.<sup>36,63</sup> These were developed through the 'line of argument synthesis', which involved identifying similarities and differences between the themes to develop an overall argument that accounts for the range and diversity of the 17 studies.<sup>34</sup> This collaborative approach challenged researcher's individual interpretation of constructs, decreased the possibility of biases and enabled more comprehensive understanding of these experiences<sup>37,64</sup>

## 4 | RESULTS

A total of 13 second-order constructs were identified across the 17 articles. These are detailed in Table 4, along with the articles from which they arise, and representative first-order constructs. These second-order constructs were then synthesised by the research teams into four third-order constructs:

**TABLE 4** Table collating the formulated third-order constructs by researchers based on second-order constructs extracted from research articles.

Third-order construct	Related second-order construct	Illustrative first-order constructs	Articles contributing to the second-order construct
Understanding scope of use as an assessment	Suitable assessment of verbal communication skills	<p>‘In terms of interacting with the patients, I think [the vOSCE] was quite positive, and very resemblant of what we'd come to expect with in-person history-taking.’ – Student (50)</p> <p>‘It effectively tested the student's powers of observation (not examination) and also allowed for an assessment of their verbal communication via technology.’ – Examiner (52)</p>	46,47,52,53,59,62
	Inadequate assessment of physical examination skills	<p>‘This experience was positive in assessing multiple clinical skills distantly. However, assessing physical examination skills was not possible’ – Head of Clinical Department (58)</p> <p>‘You could get, someone who would say all of that and then do physically exactly the opposite...So, they might say it's alright, but they might not be able to actually do it.’ – Staff (51)</p>	46,47,49,52,54,59,62
	Diminished rapport	<p>‘It was harder to understand the patient, and show empathy over a computer screen.’ – Student (54)</p> <p>‘I think ... you're limited in your assessment of rapport building, because it's difficult to build rapport over an online platform. And it's more difficult for an examiner to then see that body language interaction.’ – Examiner (50)</p>	50,53,55,59,60,62
	Standardisation of examination process	<p>‘In fact, the use of staff as actors was considered a bonus by the staff as “standardisation of interaction” was better.’ – Staff (51)</p> <p>‘I suggest using real actors in the future [...] I like working with the actors because they make the entire encounter feel more realistic ...’ – Student (53)</p>	47,52,60
Refining the operational processes	Improved accessibility	<p>‘I was able to examine from the home, students were able to sit from their place of choosing’ – Examiner (54)</p> <p>‘Virtual OSCE is pretty good because it saves a lot of time like on traffic. That's one of the best parts.’ Student (54)</p>	48,52–56,59–62
	Unpredictable logistical challenges	<p>‘I think the challenge sometimes is the connection. So for example, in my station, my student actually kind of [froze] for a few seconds ... so she must have ... experienced some ... difficulties with her internet.’ Staff (50)</p> <p>‘Convenient but then the internet connection was not always stable.’ – Student (54)</p>	47,49,50,52,55–59,62
	Impact on resources	<p>‘I believe that the virtual exam, as I said, is an optimization of resources. It saves time for evaluators and students, and it can be a more objective method to evaluate our knowledge’ – Student (55)</p> <p>‘The cost was not greatly increased, because in most cases, we used permanent staff, although there was a significant workload increase for those. And it really did rely heavily on technology, but everyone these days seems to have their own laptop. So that seemed to be okay.’ – Staff (50)</p>	50,58,59,61,62
	Challenges with assessment security	<p>‘I'm sure the virtual OSCE gave them more opportunities to have everything around them and so they were very concerned because you could see their eyes moving’ – Examiner (54)</p> <p>‘Even when giving an assignment, how can we assure that this student himself is doing the assignment?’ – Staff (59)</p>	49,55,59
Strengthening confidence in a virtual environment	Reduced intimidation	<p>‘I think it was good how, because I was at home, I was like, in a safe environment. Like there was no one else around me that stressed me out like it was just me. So I feel like it was less stressful than like being in a room with lots of people nervous waiting for it.’ – Student (54)</p> <p>‘The virtual OSCE allows you to perform without the pressure of feeling observed by an evaluation board or peers’ – Student (55)</p>	47,48,50–52,55,58,60,62
	Anxiety associated with technology	<p>‘I accidentally was a bit slow to share my screen to show the station for one resident ... I apologized, but it might have made the resident nervous that they were “losing” time because of my mistake’ – Examiner (56)</p>	51,52,54–56,59,62

(Continues)

TABLE 4 (Continued)

Third-order construct	Related second-order construct	Illustrative first-order constructs	Articles contributing to the second-order construct
		'[My] only concern regarding technical problems was that my wi-fi would get interrupted and if this were to happen, how it would affect the examiner's perception and also myself when starting the station again.' – Student (52)	
Envisioning its future role	Appropriate temporary alternative for face-to-face OSCEs	'It is the safest, most effective at the moment to assess our counseling, and patient communication' – Student (60) 'I believe e-OSCE is an acceptable option in terms of crisis (pandemics) but in normal time I do prefer the traditional face to face' – Examiner (62)	46–54,56,58,59,61,62
	Increased relevance to telehealth	'Since there are going to be a lot more virtual and phone patient encounters moving forward for health care providers, virtual OSCEs are a good chance for us to become familiar with this method of interaction.' – Student (60) 'Doing the OSCE virtually was a great opportunity for me to learn more about Telehealth and it taught me how to be flexible. For example what to do if the patient can't hear us, how to explain certain medications without having the patient physically in front.' – Student (54)	50,52–57,59,60,62
	Assimilation of virtual OSCEs	'I wonder if there's a future for a combination where you have a four-station virtual ones assessing particular skills and a four station, face to face one...So maybe a combination is the way forward. Because it doesn't look like the covid thing will go away soon.' – Staff (51)	47,49,51–55,59,60,62

- strengthening confidence in a virtual environment,
- understanding scope of use as an assessment,
- refining the operational processes and
- envisioning its future role.

These third-order constructs are evaluated in turn below.

#### 4.1 | Strengthening confidence in a virtual environment

Transitioning from an in-person to a virtual OSCE platform created anxiety and uncertainty for both students and assessors prior to the examination. Students had concerns for technology-related disruptions to their assessment experiences, such as the dependability of the assessment platform and the stability of network connectivity.<sup>47,51,59</sup> Similarly, assessors were worried about their technological proficiency as well as glitches that may impact students' performances and grades.<sup>62</sup> To address these technical and logistical concerns, both students and assessors valued the provision of additional support or training prior to the examination, such as a mock vOSCE, Q&A webinars and guidance documents.<sup>47,62</sup> These familiarisation approaches enabled students and assessors to learn the technical requirements for this exam and to understand the procedure for reporting incidents during the examination.

Overall, students felt the virtual environment was less intimidating and stressful both before and during the examination. Prior to the examination, they were not situated in an environment with other

nervous students who were waiting for their exams and were able to have a 'peace of mind' at home.<sup>55,58,60</sup> During the examination, they could 'focus on [their] own thing' without being distracted by other students who were simultaneously completing OSCE stations.<sup>47,58</sup> Students commented that the surveillance in these remote assessments was less explicit and tangible, as examiners had 'turned off their camera',<sup>52</sup> and there was not 'somebody standing over you'.<sup>48</sup> In contrast to the 'confronting' physical OSCE environment,<sup>55</sup> the virtual environment enabled students to be more collected,<sup>55</sup> comfortable<sup>48</sup> and confident.<sup>62</sup>

#### 4.2 | Understanding scope of use as an assessment

Many institutions carefully curated and intentionally modified OSCE stations to ensure suitability for the virtual environment. However, the virtual format precluded effective assessment of physical examinations because of the lack of physical interactions between students and simulated patients.<sup>46,49,52</sup> Some institutions attempted to address this gap by incorporating audio/video clips and requiring students to interpret abnormal findings.<sup>62</sup> Despite students fluently describing the process of the physical examination and explaining the findings, assessors were concerned that this knowledge did not translate into competence.<sup>47,52,59</sup> Students were only able to demonstrate 'knowing how' rather than 'showing how', according to Miller's pyramid of clinical competence.<sup>47,59</sup> Faculty members have thus suggested that these practical skills may be more appropriately assessed through continuous, longitudinal competence-based assessments.<sup>47</sup>

For other competencies, such as data interpretation, prescribing skills and communication skills, the virtual format was considered a suitable alternative.<sup>46,47,59</sup> Some students felt the set up was very similar to in-person consultations, and they were able to communicate to standardised patients effectively.<sup>47,62</sup> Others struggled to develop rapport because of the reduction in non-verbal communication cues over the screen. One student commented it was 'difficult to maintain eye contact and generate rapport',<sup>50</sup> and another found it 'difficult to be empathetic' because of a 'disconnection'.<sup>53</sup>

Faculty members were initially concerned about the standardisation and fairness of the virtual examination process but were more confident after examiner training and station calibration sessions.<sup>47</sup> The additional recruitment of exam assistants to manage timing, technology and transitions was favoured by examiners. This also contributed to standardisation by reducing 'cognitive overload' experienced by examiners who would otherwise be expected to simultaneously examine candidates and manage assessment operations.<sup>62</sup> Some institutions recruited faculty members as simulated patients to promote consistency and calibrate patient behaviour, thereby further promoting standardisation of the virtual assessment.<sup>47</sup> However, this was not always welcomed, with one student commenting having actors instead as standardised patients 'make [s] the entire encounter feel more realistic'.<sup>60</sup> Whilst the breakout rooms were used effectively and smoothly, students were also given extra time in case of any delay in transitioning between breakout rooms,<sup>47,52</sup> which 'brought respite' and 'breathing space' for examiners.<sup>62</sup>

### 4.3 | Refining the operational processes

Students and faculty commented on operational difficulties during the running of vOSCE. This included the accessibility of the assessment for the parties involved, unpredictable logistical challenges, resource-related impacts, and challenges with assessment security.

Students and faculty alike found the shift to a virtual platform to be flexible, convenient, time-saving and without 'the burden of the costs associated with travel', especially when candidates were previously required to travel to or from remote sites.<sup>52,53,55,61,62</sup> However, the comfort and convenience offered by vOSCE introduced issues with exam security. Faculty members questioned appropriate invigilation and sequestering through a virtual platform, with one assessor commented on noticing students referring to extra resources by their sides during their assessment.<sup>55</sup>

Accessibility in terms of an institution's ability to operate assessments virtually was also raised. Students thought the new platform was 'an optimization of resources' and 'achieve[d] the same goals' as face-to-face assessments.<sup>50</sup> Faculty members commented on 'new resource requirements', such as technology and additional time needed to organise this novel assessment, but found these to be an initial hurdle that once overcome was 'relatively inexpensive'.<sup>59,62</sup> One assessor was also not in favour of virtual assessment, commenting 'there is far more preparation for examiners ... compared to face-

to-face where the centres have prepped everything for the examiner to just turn up'.<sup>62</sup>

As with all operational changes, the shift to a virtual platform was met with limitations in engagement with the platform. Several participants referred to unstable internet connections as a source of issues during the assessment phase. An examiner was concerned that they 'may have made the resident nervous'<sup>52</sup> as a result of such operational difficulties. A few students<sup>37,45</sup> mentioned incompatible computer programmes for their assessment and issues with connection,<sup>56,58</sup> with one student explaining the vOSCE technological demands were ultimately 'too much ... for [their computer] to pull off all at once' to run their assessment effectively.<sup>56</sup>

### 4.4 | Envisioning its future role

The current and future roles of vOSCE were discussed in almost all studies by both students and faculty members. There was support for the transition of OSCE to a virtual setting in the extraordinary circumstances of the COVID-19 global pandemic, in particular as it was seen to be the 'safest'<sup>50</sup> alternative for all parties. Although favour was given to vOSCE during the pandemic, there were divided views on whether they were appropriate outwith the pandemic. In-person assessments were thought to be 'essential' and 'superior' by some examiners.<sup>55</sup> Most comments that favoured in-person assessments considered the virtual platform to be impeding appropriate assessment of physical examination skills. One examiner was concerned that abandoning in-person OSCE would stop students learning physical examination skills in groups.<sup>59</sup> Overall, there was a collective belief that the virtual platform was 'not a perfect replacement',<sup>46</sup> and some students speculated if a 'combination'<sup>47</sup> or use of the virtual platform for 're-examination'<sup>51</sup> may be appropriate.

The applicability of vOSCE in the climate of ever-growing telehealth was a popular opinion in many papers and supported the assimilation of the virtualisation of assessment. Students acknowledged the educational opportunity and the valuable experience the vOSCE provided by broadening their understanding of the role of telehealth in the current and future health-care climate. Students were also aware of a need for future health-care professionals to utilise and be comfortable with technology in patient interactions,<sup>55,56,59,60</sup> which echoed a faculty member's comment that 'telehealth and tele-rehabilitation will continue to expand and [be] part of our discipline'.<sup>52</sup>

## 5 | DISCUSSION

This meta-ethnography brings a systematic and interpretive review of the qualitative literature on vOSCE from before and during the COVID-19 pandemic. More than 3 years after the initial pandemic disruption, this review synthesises studies from around the world and across various health professions to describe students and faculty members' experiences of vOSCE. It demonstrates the complex

technical and non-technical factors that shaped how vOSCE was experienced and emphasises the consequences that emerged from its implementation. Although there were challenges and barriers with the use of vOSCE, there were also unintended positive consequences that may be helpful for educators to recognise as we move to a 'post-pandemic' phase and seek to learn from the pandemic responses around the world.

Previous studies have found, like we did in this study, that students across different disciplines and training stages have a mixed response to OSCEs. Health-care professional students are consistently stressed, nervous and anxious with traditional oral examinations.<sup>65-67</sup> As such, the findings in this study that vOSCE can be intimidating and stressful may not reflect factors unique to the virtual environment. Nonetheless, students and trainees were assured about the authenticity of OSCEs<sup>68,69</sup> and the extent to which it mirrored 'real-life practice'.<sup>70</sup> This reflected that the most positive aspect of vOSCE identified in our study was its ability to simulate telehealth practice, which is growing in importance across the health-care sector. Existing literature on OSCEs highlights important differences between 'high stakes' and 'low stakes' uses of this assessment tool,<sup>21,71</sup> although this comparison was not apparent in this study as the use of OSCEs in this review was generally low stakes and at a local, rather than regional or national, level.

Revisiting our conceptualisation of vOSCE as a potential threat to OSCE validity because of its divergence from real-world practice, this review reaffirms the centrality of authenticity as a fundamental tenet of OSCE validity, both through the clear focus on enhancing the realism of vOSCE itself and also through the recognition that it mirrors an important shift in professional practice in the health-care sector. A wide-ranging sociohistorical review and critique of OSCEs identified various problematic areas of disconnect between the education-assessment axis and authentic clinical practice.<sup>72</sup> In particular, it noted that there have been dramatic changes to the clinical context in recent decades, linked to workforce, teamwork, technologies and 'unofficial rules', which OSCE has struggled to keep up with. The rise of telehealth practice was rapid and explosive in response to the COVID-19 global health crisis.<sup>73</sup> We propose that the necessarily rapid rise of vOSCE in response to this crisis provided a mechanism for this change in clinical practice to unusually quickly be reflected in assessment practices.

There was broad consensus on the utility of vOSCE in mitigating restrictions such as those imposed by the recent COVID-19 pandemic. However, there was no consensus about whether vOSCE should continue to be used in isolation outside of this context, with some studies suggesting that face-to-face OSCE should remain the primary component of assessment<sup>55</sup> and some that vOSCE should be used to complement forms of face-to-face assessment.<sup>47,51</sup> Medical education leaders and policymakers may wish to 'hybridise' OSCEs by including a virtual component. For example, this could be achieved by including one or more virtual stations in an otherwise in-person OSCE circuit, focussing on assessing competencies such as data interpretation and prescribing skills.<sup>46,47,59</sup> It is important for assessment designers to promote fairness and inclusivity by making sure all candidates have appropriate devices compatible for vOSCE, and if

necessary, by providing access to a device for students. Furthermore, it will be important to continuously review and evaluate emerging technological solutions to help maximise assessment integrity through appropriate surveillance and sequestration.<sup>46,47,59</sup> Given that both students and examiners commented on the utility of vOSCE in preparing students for an anticipated greater use of telehealth in the future,<sup>50,52,55,56,59,60</sup> this may also be an area that can be prioritised in future assessment approaches.

This meta-ethnography highlights the potential utility of vOSCE in the assessment of a range of skills relevant to health professions education. However, given that this remains a relatively new assessment tool, further research is warranted to understand how variations in its implementation, including different platforms, station approaches and scoring systems, affect how assessors and students experience it. Further studies could also examine the relationships between virtual teaching and virtual assessments such as vOSCE, and explore the concerns about the relational limitations of virtual assessment raised in this study. Triangulating the findings of this qualitative review with findings from quantitative studies, including those using psychometrics, may also be valuable to assessment policymakers. Finally, given the growing interest and evolving nature of telemedicine, further research to understand how vOSCE can contribute to this in an authentic and valid way would also be worthwhile.

Overall, meta-ethnography is a widely used and effective synthesis method for qualitative studies. The use of systematic searches, snowballing and backward snowballing, and critical appraisal using the CASP framework to screen for poor quality studies contributed to a rigorous research approach. Although the wide range of CASP scores in included studies may indicate that some studies included in the review vary in the quality of their methodologies, the CASP framework does not capture relevant nuances fully and is therefore not equally applicable to all studies, nor is it a definitive indicator.<sup>45,64</sup> Only studies in English were included, which may have limited the range of experiences to predominantly Western countries. Hybrid OSCE formats were excluded, as were studies in which the examination process was asynchronous. Such studies may have yielded valuable insights into students' and examiners' perceptions of vOSCE, and further research in this area would be warranted.

The research team is comprised of medical educators who all have postgraduate degrees in health profession education and are actively involved in developing medical assessments, including OSCEs, in multiple different countries. All authors have experienced traditional (but not virtual) OSCEs during their medical training and have had varied experiences as OSCE examiners in different medical schools. We recognized our positions as both 'insiders' and 'outsiders' and were mindful of this in our approach and analysis.

## 6 | CONCLUSION

The COVID-19 pandemic brought about various barriers to assessing medical practice, including social distancing measures. This presented unparalleled challenges for medical educators to develop effective



assessment strategies in order to meet continuing demands for health-care staffing. One potential solution was vOSCE. Conceptualising this as a temporary crisis response, it is clear from the existing literature that despite challenges and limitations, vOSCE had positive consequences and could have an important ongoing role in the future of medical assessment. It will be important to track and evaluate the extent to which vOSCE persists beyond the acute response to the COVID-19 pandemic, and especially to understand whether its potential contribution to authentically assess telehealth competencies is fully realised.

#### AUTHOR CONTRIBUTIONS

All authors were involved in coming up with the research question and methodology. Data clinics were organised where SCCC, GC, JK and MAR made significant contribution to collecting and synthesising the results. SCCC, JK, DM and MAR jointly drafted the discussion section. All authors contributed to manuscript revision and gave final approval to this submitted paper. All authors agreed to be accountable for all aspects of the work.

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None.

#### CONFLICT OF INTEREST STATEMENT

The authors declare that they have no competing interests.

#### ETHICAL APPROVAL

Not applicable.

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