

RESEARCH ARTICLE**Assessment**

Disembodied, dehumanised but safe and feasible: The social-spatial flow of a pandemic OSCE

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Abstract

Introduction: The Objective Structured Clinical Examination (OSCE) is a key feature of healthcare education assessment. Many aspects of the OSCE are well-investigated, but not so its sociomaterial assemblage. The Covid-19 pandemic provided a unique opportunity to (re)consider taken-for-granted OSCE practices. Drawing on Law's modes of ordering, our aim was to demonstrate the 'mangle of practice' between space and people; the spatialised and spatialising processes of an OSCE.

Methods: We used a case study approach to critically examine a redesigned final year MBChB OSCE held during the pandemic. We used multiple sources of data to attune to human and non-human actors: OSCE documentation, photographs, field notes and semi-structured interviews with OSCE staff/organisers. Law's modes of ordering was used as an analytical lens to critically consider how people and things flowed through the adapted OSCE.

Findings: The overarching ordering was the delivery of a 'pandemic safe' OSCE. This necessitated reordering of 'usual' process to deliver a socially distanced, safe flow of human and non-human actors through the assessment space. Each change had material and social 'knock on' effects. We identified three main interrelated orderings: Substituting technologies for bodies: Disembodied and dehumanised but feasible; Flow through space: Architectural affordances and one-way traffic; Barriers to flow: Time and technology.

Discussion: Looking at the OSCE through a sociomaterial lens allows us to critically examine the OSCE's essential and complex processes and the restrictions and affordances of the spaces and props within the OSCE. In doing so, we open the possibility of considering alternative ways of doing OSCEs in the future. Moreover, conceptualising the OSCE as a living set of socially (human) and materially (nonhuman) enacted processes changes the social perception of the OSCE and highlights that an OSCE has agency on people, places and things.

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1 | INTRODUCTION

The Objective Structured Clinical Examination (OSCE) format is a key feature of healthcare education assessment. Extensive research has focused on examining the psychometric properties of OSCEs,¹⁻⁴ how raters judge students^{5,6} and student and examiners' perceptions of OSCE exams.^{7,8} On the other hand, consideration of the social, material and environmental assemblage of the OSCE has been relatively neglected. Yet this is important to study: as per Fenwick, materials 'fundamentally shape [medical] practice as well as medical knowledge' (p. 46).⁹ Rather than 'things' being merely a backdrop for human action, they are actants in the relationship between human and material.¹⁰ The spaces and objects inherent in an OSCE and how these dynamically interact with people may have consequences and are thus worthy of our attention.¹¹

We are not the first to propose that the materiality of the OSCE matters because it effects educators thinking and planning with respect to what can and cannot be assessed, the manner in which it is assessed and candidate experience and performance.¹²⁻¹⁴ However, to date, there are no empirical studies in this area: Tai and colleagues looked at how emergent combinations of social and material arrangements of examination arrangements impacted on students with disabilities, but their focus was the materiality of written assessments, not OSCEs.¹⁵ We would argue that an OSCE has a different and even more complex assemblage than a written examination. OSCE delivery and administration are enmeshed with material actors of all kinds: buildings, virtual or physical spaces, desks, beds, iPads and checklists, human and nonhuman bodies, procedural equipment and so on. There is a choreographed flow of students through OSCE stations, from A to B to C, often managed by alarms and bells, written instructions and instructors. There are restraints on who can go where and when.¹⁶ The OSCE space is filled with people—candidates, examiners, volunteer and real patients and staff—all attempting to coordinate a 'show' with the help of many different props.¹⁷ In short, the 'everyday organizing [of an OSCE] is inextricably bound up with materiality' (p. 1435).¹⁸

A sociomaterial perspective of OSCEs may be particularly pertinent in relation to the recent Covid-19 pandemic. Social distancing and other restrictions resulted in dramatic changes in the design and enactment of healthcare delivery,^{19,20} training^{21,22} and assessments.^{23,24} In respect of the last of these, Covid-19 disrupted the standard format of OSCEs. National and local guidelines designed to protect the safety of all participants and minimise risk (by, e.g., social distancing) had to be taken into consideration in OSCE planning. Some OSCEs moved online; others took place face-to-face but with major adjustments to, for example, timing, format and number of stations, how students, simulated patients (patient partners) and staff flowed through the OSCE space. This disruption to the system made matters usually in the background more visible and foregrounded essential material components of the OSCE.

The Covid-19 pandemic and its associated restrictions forced the medical education community to pause to (re)consider the taken-for-granted practices of the OSCE. Leveraging this opportunity, and drawing on a sociomaterial approach, specifically Law's modes of

ordering,²⁵ our position is that people are not disconnected from the spaces they inhabit, and space and its use are formed through interaction with living and non-living entities.²⁶⁻²⁸ Law describes modes of ordering as like 'Foucauldian mini-discourses' that run through, shape and are enacted in the materially heterogeneous processes of arranging and ordering within a place and space. Ordering can be considered as a continuing process of a system pulling itself apart and putting itself together, with the non-human having as much of a role to play as the human in this process.²⁵ In short, Law's modes of ordering attempts to attribute general patterning strategies to assemblages of people, materials, rules and regulations.

By adopting this sensitising concept, our aim is to demonstrate the 'mangle of practice'²⁹ between space and people, in other words, the spatialised and spatialising processes of a pandemic OSCE. What opportunities did the reordering offer us (affordances) in this new way of doing things and what did it not allow us to do (restrictions)? (Readers may find table 1 in Macleod et al. useful for glossary of terms used in sociomaterial research.)³⁰

Our specific research question was: How do sociomaterial arrangements order the flow of an OSCE? Specifically, we attuned to the ways in which social and material elements come together and fall apart in the context of the OSCE.

2 | METHODS

We took an intrinsic case study approach where the case is of interest in itself.³¹ This study design involves critically examining a real-life setting or event using multiple sources of evidence to capture context. The case study approach is compatible with a range of different epistemologies. Our approach was relational, underpinned by the assumption that actors (both people and things) achieve their form and attributes because of their relations with other actors. Bringing a sociomaterial lens to our case thus allowed us to 'carefully and deliberately theorize materiality' using multiple methods to consider both human and non-human elements.³⁰

2.1 | Study setting and context

Our setting was a medium-sized (approximately 190 students per year), undergraduate UK medical school with a purpose-built healthcare teaching and learning centre situated on a hospital campus. The building, which opened in 2009, contains a mixture of flexible spaces; small group working rooms, larger simulated ward-based areas, office space, social spaces, corridors and stairwells, a conference room, a lecture theatre and a café. The building hosts most campus-based medical school teaching, teaching for other healthcare professionals and undergraduate and postgraduate OSCEs. Our focus in this paper is a face-to-face OSCE, redesigned to comply with Covid-19 regulations (see Box 1) in May 2021. In our usual practice, the OSCE contains 12 stations (six stations each day with each candidate sitting both days), held on six sites within one physical building in one city, with

Box 1 Definitions used in OSCEs and the process of a 'normal' OSCE

The OSCE is 'An assessment tool based on the principles of objectivity and standardisation, in which the candidates move through a series of time-limited stations in a circuit for the purposes of assessment of professional performance in a simulated environment. At each station, candidates are assessed and marked against standardised scoring rubrics by trained assessors.'³² Typically, because of numbers of candidates and numbers of questions, the exam is run simultaneously on different assessment sites (distinct exam locations that may or may not be in the same building or city that contains one whole exam worth of stations) and multiple runs (number of times the exam is held over the course of the assessment period). Each question in an OSCE is referred to as a station. In each station, there is usually an actor/patient, a candidate and an examiner. The examiner marks the student according to a checklist and a global score. Candidates are instructed to perform a time-limited task such as taking a clinical history, examining a particular body area or communicating a management plan with the patient. A bell or alarm sounds at the end of the station, and the candidate moves on to the next station in the circuit to complete a different task. Each station is mapped against a curricular blueprint to ensure a variety of elements are being assessed. Movement around the circuit is conducted by site coordinators who move the students from station to station, keep time and organise examiners to be in the correct station on the correct site at the correct time.

six runs each day, for approximately 200 final-year medical students. During Covid-19, taking national and local Covid-19 guidelines into consideration, the OSCE went hybrid: six virtual stations plus six face-to-face stations. In the Covid-19 OSCE, the six face-to-face stations were held at 4/5 sites across two buildings in different cities, with 3/4 runs each day with students sitting all six stations in 1 day.

2.2 | Data collection

We used multiple sources of evidence and layered data collection strategies to allow us to familiarise ourselves with both human and non-human data sources, and the interplay between the various actors. These were as follows:

- Existing documentation (e.g., OSCE documents such as OSCE floor plans and questions, held by CB [OSCE Coordinator]). There were nine individual documents, including electronic OSCE floor plans for current and previous (non-Covid-19) OSCE ($n = 2$), the 'site

and run' timings grid ($n = 1$), electronic copies of all OSCE questions ($n = 6$) used during the Covid-19 OSCE and the exam-board presentation ($n = 1$) demonstrating the changed processes during the Covid-19 OSCE.

- Thirty-two photographs taken during the OSCE set-up period and on the day of the OSCE by CB (11–13/5/2021). Photographs are snapshots of time and space and enabled us to examine the material assemblages of space and how things were ordered and used.^{33,34}
- Field notes made during the OSCE process (by CB). These helped contextualise the photos and aided analysis (see later).
- Semi-structured interviews involving key OSCE stakeholders ($n = 6$).

As a first step, we considered the documentation, field notes and photographs to identify and orientate to the sociomaterial assemblages within the OSCE. Next, we developed a semi-structured interview schedule³⁵ informed by insights garnered through this document and picture analysis, reading relevant literature^{13,14,33} and discussions both within the team and more widely with those involved in organising and delivering OSCEs during the pandemic. Interview questions were designed to explore the participant's role within the newly conceptualised OSCE process and their experience of the impact of Covid-19 on the space and sociomaterial aspects of the assessment.

We used photographs and documents in two ways^{33,36}: first, as data documenting the materials of the space, that is, as a means of showing how people and things related to each other during the OSCE (as explained above). Second, we printed out the photographs and floor plans to use as prompts for discussion within the interviews (researcher-driven photo-elicitation approach).³³ Participants were shown the photos/plans and invited to select any they wished to discuss. Used in this way, the photographs and floor plans paralleled the purpose of an open question in a semi-structured interview, that is, to elicit verbal data plus participants' interpretations of the images, drawing from and reflecting their OSCE experiences. The photographs also served as a physical reminder to reflect upon the material conditions in which the OSCEs occurred.

Interview participants were recruited using purposive sampling.³⁷ We purposively sampled those individuals who had central roles in the organisation and delivery of OSCEs generally and who had also been involved in the OSCE under study. This included members of staff whose voices are typically unheard in health professions education (HPE) and HPE research, such as technicians, the building manager, patient partner coordinator and so on.³⁸

CB or LH conducted six face-to-face interviews in person, from October to December 2021 (269 minutes of interview data, average interview length of 41 minutes). The interview schedule ensured consistency, but interviews were iterative and continued until the participant felt he or she had shared their experiences sufficiently. Consistent with sociomaterialism, we considered each interview as a means for us to learn of human and non-human interactions and associations that we could not directly observe.

2.3 | Data analysis

Interviews were digitally audio-recorded for later transcription and then anonymised throughout the transcription process. Transcripts were entered into the qualitative data analysis software NVivo v12.0 (QRS International Pty Ltd, Doncaster, Victoria, Australia) to facilitate data management and coding.

In the second phase of our study, after thoroughly familiarising ourselves with the data corpus of interview and photograph data, we worked as a team to organise the data, repeatedly revisiting it to generate meaning in relation to our research question, ultimately identifying patterns and connections. In respect of the photos, we carefully evaluated and interpreted the images focusing on what was represented, as well as what was absent.³⁹ We then used Law's modes of ordering as an analytical lens to see how people and things flowed through the adapted OSCE.^{25,40}

Modes of ordering are defined as recurring patterns embodied within, witnessed by, generated in and reproduced as part of the ordering of human and non-human relations. Within the realm of OSCE, the complex arrangement of people and things, expertise and ideas, and checklists and thinking is certainly amenable to such analysis. This approach allowed us to consider the processes through which the reconceptualized OSCE was organised and enacted, as well as the materials, relationships and activities through which this ordering takes place.

Our analytical technique drew on a modified constant comparison method, originally described by Booth and colleagues.⁴¹ We developed a bespoke constant comparative approach that required ongoing reflection and revision to our emerging interpretation as we followed the actors and documented the ever-evolving nature of OSCE practices.

Our goal was to illuminate the 'Blackbox' of the OSCE. We recognised that our collective familiarity with OSCEs, and the way they are *supposed* to work, may have obscured the keenness of our observations and analytical conversations. Therefore, we deliberately focused on the interactions between multiple actors, rather than on the OSCE as an overarching process.

We narrowed our analytical lens to document how people moved through, and interacted with, the spaces in which the revised OSCE occurred. Because OSCE assemblages endure across space and time and include an infinite number of possible interactions, we set the parameter of describing interactions between people and spaces to balance meaningful insights with the practical realities of our project. Practically speaking, we considered each data source individually, and then we interpreted data for the project as a whole. Two researchers (CB and LH) took the lead on coding the data and shared their interpretations and analysis with a larger group for consideration.

We managed any coding disagreements through discussion.

2.4 | Reflexivity

In keeping with sociomaterial perspectives, we positioned ourselves not as external viewers of the world or part of the world but as active

'agents' within the assemblage being studied.^{11,42,43} We considered this constantly and critically, reflecting on our different relationships with the OSCE under study (e.g., CB is the OSCE Coordinating Lead and took the photographs used as data and to elicit discussion in the interviews, and LH is not involved in the OSCE process itself but works inside the building where the assessment was held and has previously studied aspects of how the building is used).⁴⁴ JC and AM are outsiders to this particular OSCE but familiar with OSCE processes generally, and different historical sociomaterial assemblages related to our backgrounds (e.g., medicine, psychology, sociology and nursing), theoretical interests and knowledge, and research experience. Note also that CB was both researcher and interview participant because of his OSCE coordinating role so, in line with sociomaterial orientations, his work practices were actively enmeshed in the OSCE in its becoming.

2.5 | Ethical approval

Ethical permission for this study was granted by the College Ethics Review Board of the College of Life Sciences and Medicine, University of Aberdeen. (CERB/2021/7/2136).

3 | RESULTS

The overarching key ordering during the pandemic was the delivery of a 'pandemic safe' OSCE. This necessitated reordering of 'usual' OSCE process to deliver a socially distanced and hence safe flow of human and non-human actors through the assessment space. Each change necessitated by the need to socially distance had material and social 'knock on' effects. We identified three main interrelated changes in respect to the modes of ordering at play. These were as follows:

1. Substituting technologies for bodies: Disembodied and dehumanised but feasible
2. Flow through space: Architectural affordances and one-way traffic
3. Barriers to flow: Time and technology

3.1 | Change 1: Substituting technologies for bodies: Disembodied and dehumanised but feasible

Patient partners were not allowed on campus during Covid-19, and thus, OSCE stations, which usually involved a patient partner (e.g., communication and examination skills), had to be modified. This involved halving the number of face-to-face practical stations, from 12 to six, and shifting communication skills stations to video consultations.

Shifting communication skills stations online provided some affordances: first, recruitment of a more diverse patient population and, second, the inclusion of exam questions assessing remote consulting.

In respect of the first of these, using virtual conferencing technologies allowed patient partners/to dial in from many different locations, including overseas ('some of them were coming in from abroad' [Participant 6]), decreasing the inconvenience of attending in person for patient partners and increasing the number of patients meeting station demographic requirements. This contrasted with 'normal' OSCEs, where the assessment team often struggled to recruit diverse patient partners, particularly in terms of age diversity.

Remote patients necessitated dependence on technology, which then in turn changed how space was used in the building. Rather than several face-to-face communication skills stations taking place concurrently in a large room divided by screens, each video conferencing station required an individual room. This was due not only to social distancing regulations that limited the number of people in a space but also because infection control rules disallowed the use of headphones. Sound had to be transmitted by a speaker. The difference in the use of space between a 'normal' OSCE and the OSCE held during Covid-19 is illustrated in Figure 1.

Furthermore, remote stations changed the nature of the student-patient interaction. The rooms in which stations were located were not originally designed for video conferencing and room fixtures and fittings often limited how the equipment for remote consultations could be set up. For example, students could only see the patient's face projected onto a wall or TV screen, resulting in a disembodied 'talking head'. The relationship between the location of the camera and the projection of the patient's face also caused issues for students—looking at the camera so the patient could see them directly sometimes meant not being able to face the patient's image:

It's all to do with position of the camera and sometimes that can lead difficulties if the camera is looking ... one way and the student is trying to communicate with the patient and trying to do visual cues but actually, the patients are on the big screen, but the camera is to the

left or to the right.

(Participant 3; see also Photograph 1)

The physical examination stations remained face-to-face, but patient partners were replaced by props such as models of body parts or mannequins. This changed the nature of the experience for students:

The students were completely thrown by it, and because it wasn't what they expected and it's very difficult to examine an artificial limb that doesn't move and explain things to a limb as opposed to explaining to a person what you want them to do so I think they just find that quite difficult. ... doing that whole simulation as if it's a patient, I think they kind of struggled with that as an overall concept.

(Participant 2)

The shift to models also changed the nature of what was assessed. In the traditional version of the station, marks were awarded for assessing the patient's joint movement. The models that were used did not have movable joints, so workarounds had to be made to the marking scheme and examiner instructions:

When they come to assess movements ask them to describe which movements they are assessing and demonstrate movements using their own ankles (if possible or the examiners ankles if unable to perform themselves).

(Document, Examiner instructions)

On the other hand, replacing patients with models offered some affordances. The use of models enabled the introduction of stations assessing clinical skills, which could not be demonstrated on patient partners (e.g., thoracic examination performed on a mannequin and an



FIGURE 1 Floor plan of the 2019 (pre-pandemic) and the 2021 (during the pandemic) Objective Structured Clinical Examinations (OSCEs). The space usually held five sites (areas where OSCE is run simultaneously) and 30 stations. The combination of social distancing and other regulations and the use of technology during the pandemic meant the same space could only hold two sites and a total of 12 stations. [Color figure can be viewed at wileyonlinelibrary.com]



PHOTOGRAPH 1 A remote communication skills Objective Structured Clinical Examination (OSCE) station. The patient's head is projected onto wall directly in front of the student's chair. In this station, the webcam is balanced on top of a plastic box in the middle of the station, facing the student. [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1111/medu.15173)]

acute care resuscitation-based station). Although this reordering occurred through necessity, it changed ways of thinking for future OSCEs:

It caused me to think more about non-human equipment going forward. So, would I use that model again? Probably not, but will I use other models going forward? Definitely.

(Participant 2)

Technology also enabled social interaction across dispersed sites, which, in turn, afforded gains in terms of standardisation. Site coordinators used their smartphone cameras to discuss and visually compare how things were set up in mannequin-based stations and thus ensure consistency across sites. For example, Photograph 2 shows a station with a mannequin on a hospital bed. In the foreground of the image, there is a human hand holding a phone. On

the screen of the phone is a live image of a second mannequin in a different OSCE site:

So this is obviously on the phone to [OSCE location in another city] and then us looking at their mannequin while they look at ours to make sure that we've got everything set up set up the same.

(Participant 3)

In summary, the pandemic required reordering of exam spaces to facilitate virtual consultations substituting technologies for human bodies. Virtual consultations required creation and ordering of patients in physical spaces (their own homes) within virtual spaces (blackboard-virtual learning environment software) within physical spaces (classrooms) for the purpose of assessment. These reorderings changed the nature of the OSCE process, limiting some activities but exposing new ways of working.



PHOTOGRAPH 2 Using technology to compare and standardise station set-up across sites. [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1111/medu.15173)]

3.2 | Change 2: Flow through space: Architectural affordances and one-way traffic

Students flow through OSCEs, guided from station to station by bells, alarms, whistles and staff—indeed an ‘OSCE is like herding sheep’ (Participant 3). During Covid-19, the basic principles of ‘OSCE choreography’ remained but their precise nature changed because of the need to maintain social distancing. Human traffic through the spaces in the building had to be one way and socially distanced, controlled by rules, safe distancing notices, tape on floors to indicate distances between humans, maximum room occupancy rules and so on (see Photograph 3).

Student cohorts (i.e., the size of a group of students flowing through one OSCE run at the same time) were smaller because of restrictions on the number of people allowed in any one space at any one time, and students were separated spatially within their cohorts because of safe distancing regulations:

The actual setting up of the chairs [as a holding area in readiness for candidates starting their assessment] was

actually really important. Because it kept everybody together and [we] knew where everybody was. It took a lot to get our heads around how we're going to do this.

(Participant 3)

Although there were fewer students per cohort and fewer OSCE stations, the same number of OSCE organisers were required to ensure adherence to pandemic regulations and to monitor the flow of students. However, instead of the organised chaos of a typical OSCE, the pandemic OSCE was viewed by staff as easier to control because of fewer stations and less human and material density of stations within rooms. Staff also discussed how the need for individual rooms for each station (because of social distancing regulations) had the benefit of ensuring that candidates did not overhear other candidates or patient partners in adjoining stations.

They [examiners] [previously] found not being able to hear a student was difficult because the student next door was maybe extremely loud or the patient partner



PHOTOGRAPH 3 A corridor showing physical distancing (tape) and one-way (sticker) rules. [Color figure can be viewed at wileyonlinelibrary.com]

was extremely loud and therefore it just put off that student or the examiner maybe didn't actually pick up things because they didn't actually hear it and so having everything in single rooms cut down in that whole variability.

(Participant 3)

Individual rooms also enabled the inclusion of potentially noisy stations, such as acute care stations involving defibrillators.

In summary, the pandemic required reordering of both the exam format and the number of bodies occupying spaces at any one time. The architecture offered the organisers both affordances during the pandemic in that it was easier to control the movement of candidates through space, and also limitations; the same numbers of facilitators were required to move students through the one-way system and stations as during a non-pandemic OSCE.

3.3 | Change 3: Barriers to flow: Time and technology

OSCE assessment always requires strict ordering in terms of time (e.g., time before the examination commences to prepare and manage all participants [students, examiners and patient partners], time for stations and time between stations) and space (e.g., all those participating in the OSCE having to be in the right place at the right time).

The medical school had much experience of running traditional OSCE examinations. The usual process was tried and tested and ran smoothly most of the time.

A lot of thought goes into it, and we try and make the best of it in what we can with them at stations and sites.

(Participant 5)

[The OSCE is like ...] A bad theme park! There is a lot of queueing. There's a lot of wanting to be in specific places at specific times. I'm trying to get people to those places at those times.

(Participant 4)

However, during Covid-19, the well-oiled OSCE machine was no longer fit for purpose. Timings had to change because of group size restrictions, the need to disinfect stations between candidates and to provide extra time in case of technological issues: “[Moving to video conferencing] posed logistical challenges so we built in extra time during the OSCE itself” (Participant 2). The combination of social distancing rules and the increased time required to prepare stations meant that the OSCE examination process required more time overall. Pre-Covid stations lasted 8 minutes with 90 seconds between stations for reading time, whereas the pandemic OSCE required an additional 30 seconds in the time between stations for

cleaning equipment and surfaces. There were also empty spaces built into runs in case students were required to be reinserted mid-run. The consequence of this new ordering was that instead of 200 students passing through 12 face-to-face OSCE stations over a 2-day period, 2 days were required for the same number of students to pass through six face-to-face stations.

The use of technology also impacted on timings, with those coordinating the OSCE setting aside more time to check and confirm proceedings with patient partners who were contributing remotely. This necessitated even more use of technology. For example,

One of the girls [a female patient partner] got confused. ... she thought in the afternoon that the start time was the start of the exam and hadn't gone into the briefing ahead of time. So, when I was trying to phone her, she'd gone to the loo, was making herself a cup of tea, etc.

(Participant 6)

Remote contributions also necessitated extra time in advance of the actual OSCE, to check systems and connectivity and give instructions to examiners and patient partners not just about the content of a station and the marking schemes but also how to log on, what to do if the connection dropped and so on. This additional preparation and the need to adjust internal systems to ensure the flow of the OSCE brought new human players into the OSCE who would not normally be involved:

So normally our university machines [computers] time out after an hour. So, we had to have IT come and turn off all the timeouts on the televisions and the AV equipment.

(Participant 6)

In summary, timings had to be reordered to accommodate new technologies being used in the assessment (video conferencing facilities). Participants discussed planning and adjusting for both expected and planned additional components of running the exam during the pandemic (personal and protective equipment, cleaning of equipment, etc.) but also planned a resilient assessment should there be expected but unplanned additional timings required such as IT difficulties with the use of video conferencing technology.

4 | DISCUSSION

4.1 | Main findings

Focusing on how we ran an OSCE during Covid-19 helped us reconsider the essential processes of the OSCE during non-pandemic ('ordinary') times. This in turn opened up the space to think critically about the processes involved in an OSCE and how they can be changed or not.

The overarching requirement of having a 'pandemic safe' OSCE led to a reordering of normal, expected processes. Rather than on efficiency, the focus was on allowing a safe flow of human and non-human actors through the assessment spaces. Each change led to additional effects in this complex activity. Human bodies were substituted by various technologies (mannequins and videoconferencing) leading to senses of disembodiment and dehumanisation of patients but a feasible and deliverable assessment process. The architecture of our spaces offered affordances and limitations as movement patterns of both human and non-human actors changed through our assessment spaces. There were new barriers to flow to consider, both in the social world (time for candidates to move and complete new tasks such as cleaning and donning PPE) and in the material world (complications of introducing technology into the assessment process). Patient partners, candidates, examiners and organisers alike experienced a variety of affordances as well as challenges when technology was embraced to allow the safe function of the OSCE. It was clear that materials do matter in an OSCE.

4.2 | Comparison with previous literature

Over the last few decades, there has been an increased focus within the social sciences on how people, spaces and things are arranged to allow everyday practices, such as an OSCE, to be accomplished.^{44,45} This is also true in the medical education community.¹⁴ In response to this, our sociomaterial investigation provides a powerful example of the complexity of OSCE, deliberately attending to the taken-for-granted material facets of this form of assessment.^{9-11,30,34,45}

Modes of ordering have been studied in other sociomaterial systems.^{25,40,46} In Law's original ethnographic work, for example, he described the ordering processes required to allow a laboratory to function effectively, the policies, procedures, architecture and social relations all interacting and entwined with each being affected by the other.²⁵ Similarly, through the telling of this OSCE story, we can clearly see that each change made has knock on effects to each other actor within the assemblage, sometimes for the better (e.g., allowing younger patient partners to attend via video conferencing from out with the city where the exam was occurring) and sometimes for worse (model of joint resulting in a disembodied, dehumanised examination) with both meeting the overarching ordering of providing a 'safe OSCE'.

What constitutes a safe OSCE in the ongoing pandemic era? The notion of safety, in and of itself, is complex and includes both social and material elements. Obviously, following local best practices designed to slow the spread of Covid-19 was the primary concern; however, there were also other elements of safety to consider, including respecting privacy of participants and managing the high-stakes nature of the assessment and its associated performative pressures. For example, in our experience, most stations involving examiners and patients were conducted via video conferencing. This practice led to what both Cleland and MacLeod describe as 'uncurated exposure' whereby the viewers (students and examiners) gained exposure to the

personal realms of the patients own environments.^{47,48} This adds another dimension into the OSCE. For example, did the history being portrayed match what the student was seeing in the background of these video conferences? As MacLeod and colleagues state, 'notions of privacy and control are reshaped', by this when the OSCE was reconfigured online.⁴⁸

The OSCE is simultaneously intended to serve as a proxy for an authentic clinical encounter and at the same time not an authentic clinical encounter. The people, spaces, timings and things of the OSCE are ordered for the purposes of assessment, not clinical practice. Hodges describes the highly choreographed aspects of the OSCE with 'the movements of participants timed and sequenced'. An examination, yes, but it was also a performance.⁴⁹ Gormley et al. take this further, examining the 'show' of the OSCE.¹⁷ This aligns with our understanding of the actors at play within the orderings of the OSCE so that 'the [assessment] show must go on'.¹⁷

4.3 | Implications for practice and future research

Although Covid-19 acted as a magnifier within our studies, our findings are clearly transferable to other situations. Within medical education, there are lots of 'known' disruptions, such as increased student numbers and changing government/regulator policies and expectations. There will also be other 'unknown' future disruptions. By looking at OSCEs through a sociomaterial lens, we open the possibility of considering alternative ways of doing them in the future. In other words, although unique in context, as is much of qualitative investigation, this study has generated transferrable knowledge and highlighted questions healthcare educators need to ask in the future.⁵⁰ We cannot predict the next disrupting event that will require social and material reordering and thus cannot foresee the influences of these reorderings on OSCE-related phenomena such as candidate performance,¹² OSCE costs,⁵¹ use of patients and technology and so on. However, what we can say is that those managing OSCEs in future disruptions carefully consider how each change or decision, each new configuration of either social and material aspects of an OSCE, changes things and has 'knock on' effects, potentially positive or negative, within the network of an OSCE.

4.4 | Strengths and limitations

A clear strength of this study is that it is a theoretically grounded, empirical, case study. Law's modes of ordering orientated us to consider the processes through which the OSCE is organised, as well as the materials, relationships and activities through which this ordering takes place.²⁵ Further strengths include hearing under-represented voices in the OSCE discourse, that is, OSCE organisers rather than candidates or examiners.³⁸ This lens and these voices allowed us to understand more of the sociomaterial complexities in play during an OSCE and highlighted the restrictions and affordances of the places

and props within the OSCE. Although we consider hearing the under-represented voices a strength within our study, we also acknowledge that the views of patient partners, examiners and students themselves as to the restrictions and affordances of things like video-linking from home (patients) and not mixing with each other (examiners and students) could have provided further richness to our data. We are also aware that, in this study, we have a researcher as participant. The participant researcher's values may have influenced data collection and interpretation, so we mitigated this by taking care of the positionality of the whole team and encouraging full and open team discussions around data collection and analysis.

Although there are increasing examples in the literature of socio-material studies within other areas of medical education (e.g., simulation-based learning and⁵² distributed medical education³⁸), we are aware of only one earlier OSCE study using this lens.¹² Addressing methodological shortcomings in this earlier study, we took care to use a montage of data collection methods to provide multiple perspectives. Moreover, we had the unique opportunity to use a major disruption, a worldwide pandemic, to bring to light the complex orderings and reorderings that are constantly happening in the socio-material world of OSCE assessment.

Finally, by conceptualising the OSCE as a living set of socially (human) and materially (nonhuman) enacted processes, we propose that the OSCE can be considered as a verb, in other words, an institution actively 'OSCEs'. Doing so changes the social perception of the OSCE and highlights that an OSCE has agency on people, places and things.^{13,53}

4.5 | Conclusion

Viewing a pandemic OSCE through a sociomaterial lens illuminated the complex orderings required to deliver a safe, competency-based assessment. Considering the OSCE as a living set of socially (human) and materially (nonhuman) enacted processes changed the social perception of the OSCE and highlighted that an OSCE has agency on people, places and things. In short, the sociomaterial orderings within an OSCE influence the what, when, where and how of assessment. Those managing OSCEs must carefully consider how each change or decision, each new configuration of either social and material aspects of an OSCE, changes things, positively or negatively, within the network of an OSCE.

AUTHORS' CONTRIBUTIONS

The idea for this study came from Craig Brown and evolved through discussions involving all four authors. All authors contributed to developing the protocol and documents for ethics review. Craig Brown and Lorraine Hawick collected the data and the initial data analysis. Jennifer Cleland and Anna MacLeod oversaw the analysis. Craig Brown prepared the first draft of the paper, which was extensively reworked by Jennifer Cleland and Anna MacLeod. All authors contributed to preparing the final manuscript. All authors read and approved the final manuscript for submission.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

The data are available upon reasonable request by contacting the corresponding author.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical permission for this study was granted by the College Ethics Review Board of the College of Life Sciences and Medicine, University of Aberdeen (CERB/2021/7/2136).

PRESENTATIONS

An early version of this study was presented in the Research Stream of the Association for Medical Education in Europe Annual Conference, Lyon, France, August 2022.

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