

Main Article

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Author for correspondence:

Dr Megan Walker, Manchester Royal Infirmary, Oxford Road, Manchester, M13 9WL, UK
E-mail: meganwalker@doctors.org.uk

Abstract

Background. Coronavirus disease 2019 has transformed medical education worldwide. Innovations in ENT teaching for medical students have focused on virtual learning, often replacing history-taking, patient examination and practical procedure observation. This qualitative study aimed to evaluate student experience and the impact of the altered learning environment.

Methods. Open-ended questionnaires were sent to students following ENT placements from March 2020 to March 2021. Responses were qualitatively analysed and coded using a grounded theory approach. Iterative cycles were used to develop codes via a constant comparison technique. Emerging categories from codes were refined to identify core themes.

Results. Core themes were explored, including: reduced clinical experience and patient contact compared with student expectations; challenges to learning opportunities in ENT; and the experience of different teaching methods, or preference for face-to-face teaching.

Conclusion. Medical students on ENT placement have expectations of patient contact for learning opportunities. ENT departments should ensure that patient contact and face-to-face learning opportunities are facilitated, while maintaining safety, including appropriate personal protective equipment provision.

Introduction

The coronavirus disease 2019 (Covid-19) pandemic has transformed the way medical students are taught globally. Disruptions to undergraduate medical education have been essential because of factors including necessary social distancing, access to personal protective equipment (PPE), risks of contracting Covid-19 and available staffing levels.¹

Recent systematic reviews^{1,2} describe changes to medical education introduced in response to the pandemic, many of which involved a switch to virtual learning and simulation training for treating Covid-19 patients. Emerging studies describe novel ways of teaching across the curriculum, with a focus on the virtual delivery of medical education.^{3–5} The effects of this are becoming evident: some studies describe a positive change, with virtual learning platforms being well-received by medical students;⁵ however, multiple studies show that virtual learning does not compensate for face-to-face teaching.^{3,4}

The pandemic has brought various adaptations to medical education in ENT surgery, including virtual platforms with live lectures, video content and pre-recorded cases,^{6–9} live virtual operative experiences,¹⁰ and hybrid simulation with virtual learning prior to practical scenarios.¹¹ However, there is very little feedback from medical students on these novel teaching methods, and on the students' overall experience of placements during the pandemic, particularly in the field of ENT.

ENT is a highly practical specialty, with a significant level of patient contact. Aerosol-generating procedures (AGPs) involving the upper respiratory tract are common. Such procedures are associated with an increased risk of Covid-19 exposure given the high viral load in nasopharyngeal mucosa.¹² Evidence from the early stages of the pandemic described otolaryngologists as being adversely affected by Covid-19,¹³ and linked this to the prevalence of high-risk procedures in the specialty.^{7,12} These increased risks to clinical staff and students have resulted in an overhaul of clinical rotations.¹⁴

In a national survey, medical students in the UK reported a lack of confidence and preparedness for working clinically after graduating because of the impact of the pandemic.¹⁵ Students have also reported that disruptions caused by Covid-19 will influence future specialty selection.¹ The pursuit of ENT as a specialty choice among medical students is suspected to be negatively affected, given reduced learning opportunities and a lack of exposure to the specialty.^{9,16}

At Manchester Royal Infirmary, medical students attend a one-week placement in ENT during year four, which allows a limited amount of time, even prior to the pandemic, for students to gain experience of a broad specialty. Some year five students are allocated to ENT for their five-week surgical placement. The pandemic has disrupted departmental services since March 2020, which has in turn disrupted medical education. Early in the

pandemic, some year four placements were cancelled and rearranged as 'catch-up weeks' during year five. Because of social-distancing measures, most teaching sessions were given virtually across the university. Other factors suspected to have affected medical students in the department include disturbances to operating theatre and clinic schedules, and variable staff availability for teaching as a result of Covid-19 adjusted rotas.

This qualitative study aimed to evaluate the impact of the Covid-19 pandemic on ENT teaching for undergraduate medical students, and to gain an understanding of the undergraduate experience of ENT placements during this extraordinary time.

Materials and methods

Study design and participants

We conducted an online, hybrid, retrospective survey with a qualitative focus. We asked students to describe their experiences of the following aspects of the ENT placement: patient contact, exposure to practical procedures, and experience of online teaching; we also provided room for them to describe positive experiences and challenges faced during the placement, with suggestions for improvement.

Participants were year four and five medical students at the University of Manchester, who had their ENT placement at Manchester Royal Infirmary between March 2020 and March 2021. This retrospective survey considered a year of the effects of the Covid-19 pandemic in the UK on ENT teaching for medical students.

Ethical considerations

Approval was gained from the University of Manchester to send the survey to medical students via university e-mail. The survey was anonymous, to enable students to give honest feedback on their ENT placement. Completion of the survey was optional in order to avoid the biases that can occur when providing feedback as a mandatory exercise.

Data collection and analysis

The survey was distributed among participants between January and March 2021. Data from the survey were collected via Google Forms survey administration software, and exported using Microsoft® Excel® spreadsheet software. Qualitative data were grouped into core themes using a grounded theory approach. Data were coded and analysed using the Dedoose desktop application. Significant statements were coded using this software, by the authors, into identified sub-themes; sub-themes were grouped, with relevant core themes as the 'parent theme' for each.

Results

The survey had a 32.1 per cent response rate. Seventy-three per cent of respondents were in year four of medical studies and 27 per cent were in year five. Core themes identified included: (1) clinical experiences; (2) challenges that arose; and (3) feedback on the teaching and learning that took place in the ENT department during the placement. Within these overarching themes, sub-themes were recognised, a summary of which is described in Table 1 and displayed in Figure 1.

Theme one: clinical experiences

In general, participants had negative opinions about their clinical experiences during ENT placements since the onset of Covid-19. Most students expressed disappointment at having a reduced level of patient contact and reduced exposure to practical procedures relevant to ENT. A number of students described an inability to attend the operating theatre to observe ENT operations.

Reduced patient contact

The majority of students described a lack of patient contact during the placement. A reduction in opportunities for history-taking and examining patients was prevalent on the wards and in clinics. For example, comments included: 'There wasn't much patient contact. I was able to speak to a patient after [the] ward round, but finding patients was really difficult', and 'Limited patient contact in clinics; only saw one or two patients per session so limited interaction and opportunity to take histories/examinations'.

Reduced exposure to practical procedures

Almost all participants described a lack of opportunity to observe or assist with practical procedures during their ENT placement. A recurring reason given was the risk of exposure to Covid-19 through observing AGPs. Many students had not been fit-tested for the appropriate PPE prior to beginning the placement: 'I was able to observe some procedures in the ear clinic but was disappointed that I could not observe a laryngoscopy in another clinic as it is classed as an aerosol-generating procedure and I have not been fit-tested'.

Inability to attend operating theatres

A number of participants described an inability to attend the operating theatre to observe scheduled ENT procedures while on their placement. A lack of fit-testing and the aerosol-generating nature of some scheduled operations were described as barriers to attending operating theatres: '[I was] unable to be fit-tested and watch procedures and operations'.

Final year students on their five-week surgery placement in ENT expressed disappointment at the limited operations scheduled, associated with the cancellation of elective procedures as a result of Covid-19: 'Elective subspecialties were not doing many operations' and '[It was] a shame there were not more subspecialties to see in theatre'.

Theme two: challenges

Medical students on ENT placement during the pandemic encountered various challenges to learning opportunities. The most commonly faced challenges were the risk of contracting Covid-19 and the aforementioned lack of fit-testing. Other sub-themes included social-distancing limitations, telephone clinics and communication difficulties.

Coronavirus risk and fit-testing

As described, many students were unable to examine patients, observe AGPs or attend operating theatres because of the risk of contracting Covid-19, particularly among students who had not been fit-tested for the correct level of PPE. Their comments included: 'Limited patient contact and examinations due to the nature of Covid-19 and not being fit-tested. I think this impacted a lot on learning as I was unable to

Table 1. Summary of data*

Core theme	Sub-theme	Description	Example
Clinical experience	Reduced patient contact	Less patient contact than expected, or expressed desire for increased patient contact	'There wasn't much patient contact. I was able to speak to a patient after [the] ward round, but finding patients was really difficult'
	Reduced exposure to practical procedures	Fewer opportunities for observing or assisting with practical ENT procedures	'I was able to observe some procedures in the ear clinic but was disappointed that I could not observe a laryngoscopy in another clinic as it is classed as an aerosol-generating procedure & I have not been fit-tested'
	Inability to attend operating theatres	Unable to attend operating theatres, or expressed desire to observe greater range of ENT operations	'Elective subspecialties were not doing many operations'
Challenges	Covid-19 risk & fit-testing	Risk of exposure to Covid-19 & not being fit-tested for appropriate PPE as barriers to clinical opportunities	'Limited patient contact & examinations due to the nature of Covid-19 & not being fit-tested. I think this impacted a lot on learning as I was unable to undertake a full throat or nose examination or have an examination observed by a senior'
	Social-distancing limitations	Fewer learning opportunities to be distributed between students, or limits on number of students per clinical session	'Covid was a big challenge as it meant a lot of us didn't get to see anything; even on the ward round there [were] about 6 students & 4 doctors so we had to stand outside the curtains'
	Telephone clinics	Fewer face-to-face appointments & more telephone appointments, resulting in barriers to learning	'We could hear & understand little from one side of a telephone consultation'
	Communication difficulties	More head & neck cancer in-patients & fewer acute admissions	'Dramatically reduced patient contact due to... fewer patients who were not difficult to communicate with (tracheostomy laryngectomy)'
Teaching & learning	Negative impact on learning	Concerns for reduced learning during placement, or that future clinical ability will be negatively affected	'No exposure [to procedures], & it has made learning management of ENT conditions a bit more challenging because I have[n't] seen how they happen, e.g. grommet insertion'
	Positive feedback	Praise for teaching sessions & staff delivering teaching on ENT placement	'Doctors were very friendly & engaging, & when I had the opportunities to attend ENT clinics, this was excellent for learning'
	Online teaching	Positive comments for online teaching during placement	'[There was] more online teaching than usual, which was really good at a knowledge point of view. Online teaching was more present, & more conditions were covered thoroughly'
		Challenges experienced regarding online learning, or expressed preference for face-to-face teaching	'Took me a while to get used to the whole online learning platform; [I] still prefer real-life teaching, [it is] more interactive'

*The data are broken down into core themes and sub-themes on analysis. A description and example quotation for each sub-theme is presented. Covid-19 = coronavirus disease 2019; PPE = personal protective equipment

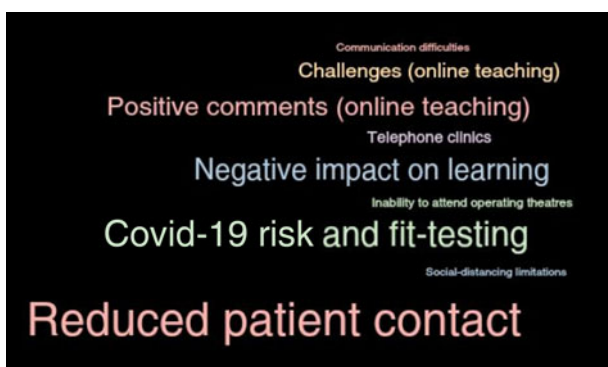


Fig. 1. Word cloud showing sub-themes identified from qualitative data, coded and exported using the Dedoose desktop application. More frequently expressed themes are displayed proportionately larger than less frequently expressed sub-themes. Covid-19 = coronavirus disease 2019

undertake a full throat or nose examination or have an examination observed by a senior’.

A lack of fit-testing for PPE resulted in some students being turned away from learning opportunities: ‘I didn’t know I had

to get fit-tested; as a result, when I went to my clinic I was turned away’.

Students who failed their fit-test were not offered any alternative PPE: ‘I failed my fit-test, which made patient contact very limited’.

Social-distancing limitations

Because of the necessary social distancing throughout the pandemic, access to learning opportunities was increasingly difficult. Disruption to services as a result of Covid-19 meant there were fewer learning opportunities. Several participants found this to be a challenge: ‘Covid was a big challenge as it meant a lot of us didn’t get to see anything; even on the ward round, there [were] about 6 students and 4 doctors so we had to stand outside the curtains’.

A final year student had to devise their own timetable as a result of their placement supervisor being unable to work in a patient-facing capacity: ‘My supervisor was not doing any face-to-face work, so... it was sometimes hard to create my own timetable’.

Telephone clinics

Participants described the reduction of face-to-face appointments and a move towards telephone consultations as a challenge and a barrier to learning. This contributed to a reduction in patient contact and learning opportunities: 'Very few face-to-face consultations, [the] majority [were] telephone. I just observed', and 'We could hear and understand little from one side of a telephone consultation'.

Communication difficulties

Some students described difficulties communicating with ENT patients, given the larger proportion of in-patients with head and neck cancer and the smaller number of acute ENT patients admitted during the pandemic. This was a barrier to some students when taking histories from patients: '[Communication difficulties] dramatically reduced patient contact due to fewer face-to-face appointments, and fewer patients who were not difficult to communicate with (tracheostomy/laryngectomy)', and '[Communication difficulties made it] difficult to take histories on the ward, with lots of patients struggling to speak'.

Theme three: teaching and learning

The quality of teaching sessions and learning experiences during the ENT placement was an issue frequently raised in participants' responses.

Negative impact on learning

Many students described a negative impact on learning, and relayed concern for how this could affect their ability to manage ENT patients in the future: 'No exposure [to procedures], and it has made learning management of ENT conditions a bit more challenging because I have[n't] seen how they happen, e.g. grommet insertion'.

Positive feedback

Despite these barriers to learning, many students expressed appreciation for teaching delivered during their placements, conveying praise both for the quality of teaching and for the clinicians that provided this: 'Teaching sessions were really useful in getting a good overview of ENT as a specialty', and 'Doctors were very friendly and engaging, and when I had the opportunities to attend ENT clinics, this was excellent for learning'.

Online teaching

Participants were asked to describe their experiences of online teaching, which was new to most students at the onset of the pandemic. This resulted in mixed opinions. Some students were satisfied with online teaching, and did not find the format detrimental to learning: 'The induction teaching was actually a very useful introduction to the placement, and the online nature of the session did not detract from it whatsoever', and '[There was] more online teaching than usual, which was really good at a knowledge point of view. Online teaching was more present, and more conditions were covered thoroughly'.

Others found online teaching acceptable, but nevertheless expressed preferences for returning to face-to-face teaching: 'The online experience served as a way to compensate [for] the lack of clinical experience... it would have been ideal to have more face-to-face teaching', and '[It] took me a while

to get used to the whole online learning platform; [I] still prefer real-life teaching, [it is] more interactive'.

Discussion

This qualitative study evaluated numerous aspects of undergraduates' experiences of ENT teaching during the Covid-19 pandemic. The majority of students expressed disappointment in reduced face-to-face patient encounters. There is an expectation of patient contact during ENT placements, primarily for history-taking and examination opportunities. The General Medical Council's Outcomes for Graduates describes 'standards and requirements for all stages of medical training',¹⁷ in which it is clear that patient contact is essential for developing communication skills, history-taking and examination. Our study also demonstrated that observation of clinical procedures performed on patients is important for medical students in ENT.

The risk of Covid-19 exposure and lack of fit-testing for PPE were cited repeatedly as being key barriers to learning on ENT placement. Adequate PPE is imperative for the safety of clinicians carrying out ENT procedures.¹⁸ Because of short placements, high turnover of students and staffing, and resource limitations, there were no formal sessions held for medical student fit-testing; however, drop-in sessions were available in the hospital on a regular basis. Not being fit-tested resulted in missed learning opportunities for students, such as being unable to observe procedures or attend operating theatres. During a one-week placement, it is vital that each learning opportunity is maximised, and that students are not turned away from clinical sessions because of a lack of fit-testing.

ENT services deemed non-urgent or elective were cancelled from the onset of the pandemic in order to prioritise the response to Covid-19 in areas such as staffing and critical care capacity.¹⁹ This disruption has profoundly affected medical students' experiences, manifesting as reduced learning opportunities, including a lack of exposure to subspecialties such as otology and rhinology. Fewer ENT subspecialties functioning at maximum capacity also resulted in students being turned away from learning opportunities because of social-distancing limitations; there were fewer clinical sessions for distribution among the number of students present each week, and social distancing meant that capacity for observation in each clinical session was reduced.

- Medical students expect an interactive ENT placement, with regular patient contact for history-taking and examinations
- Coronavirus disease 2019 (Covid-19) has resulted in lost face-to-face learning opportunities for students, which virtual learning does not compensate for in ENT
- Risk of Covid-19 and lack of fit-testing for appropriate personal protective equipment (PPE) were key challenges to optimum learning for medical students on ENT placement
- Virtual learning has received good feedback; however, students still prefer face-to-face teaching sessions
- ENT departments must ensure that face-to-face learning with patient contact can take place safely for medical students, to optimise learning
- Medical students must be prioritised on a level with clinical staff for PPE fit-testing, to ensure learning can continue

Furthermore, because of reduced capacity in hospitals, a greater proportion of ENT in-patients were head and neck cancer patients with tracheostomies and laryngectomies, and fewer were acute admissions. As well as fewer acute ENT conditions on the wards, communication difficulties with ENT patients were described, which impacted on medical students'

ability to take histories from or examine patients. It is expected that with a gradual return to a 'normal' distribution of services, there will be a greater number and variety of clinical sessions to distribute among medical students. However, the course of the pandemic has evidently been variable, with the UK only beginning to ease restrictions in April 2021 after over a year of lockdowns. In light of ongoing uncertainty, it is imperative that alternative strategies are sought, to ensure that students are not turned away from clinical sessions, but also to optimise care for ENT patients long-awaiting elective procedures in 'non-urgent' subspecialties.

Across all clinical specialties, there has been a move towards virtual learning, limiting face-to-face encounters, in order to prevent the spread of Covid-19. While there was praise for the quality of online teaching sessions, many students expressed preferences for face-to-face teaching because of greater engagement and interactivity. No students preferred online teaching over face-to-face sessions. Extensive virtual learning platforms have been developed in some ENT departments; nevertheless, studies have shown that novel virtual learning techniques do not out-perform traditional teaching methods.⁶ Negative aspects of digital learning have been identified, including 'digital fatigue, decreased ability to participate, and lack of clinical skills, laboratory, and hands-on learning'.³ It is clear from our study that virtual learning alone does not compensate for face-to-face clinical teaching experiences centred on patient encounters.

Conclusion

Qualitative data provide rich information on the experiences of undergraduate medical students on ENT placement during the Covid-19 pandemic. Medical students experienced less patient contact, and reduced face-to-face clinical experiences and teaching, which has negatively affected their learning.

Key barriers to learning opportunities were apparent with the onset of the pandemic, with a primary one being the lack of fit-testing for an appropriate level of PPE. As future clinicians, medical students must be prioritised for fit-testing on a level with other healthcare professionals, in order to ensure that optimum learning can be achieved while students are on clinical placements such as ENT. Alternative PPE should be provided for medical students should they fail a fit-test, to ensure that their learning continues.

A move towards online learning has compensated for a lack of clinical experiences for students on ENT placement, and this has received positive feedback from students. However, virtual teaching sessions and socially-distanced ward rounds do not meet students' expectations of an interactive week in ENT.

Limitations

The response rate for this study was 32.1 per cent; thus, the sample is not representative of all medical students on ENT placement during the year. There may therefore be biases among the reported experiences. Our study describes the experiences of medical students from one university at one hospital site for ENT placement. These views may not be representative of undergraduates' experiences across the UK.

Recommendations

ENT departments must ensure that patient contact and face-to-face learning opportunities are available to medical

students; for example, by ensuring students are fit-tested for the appropriate level of PPE prior to their placement.

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Competing interests. None declared

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