


Evaluating the Usefulness and Acceptability of a Revision-Purposed ‘Specialties’ Webinar for Educating UK-Based Fifth and Final Year Medical Students During the COVID-19 Pandemic: Is This the Future of Medical Education?

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Background: To assess whether an online course is a useful method of learning for medical students revising for specialty examinations in the context of social distancing restrictions during the COVID-19 pandemic.

Methods: A free, one-day webinar was offered to fifth and final year medical students with an examination-based approach. Teaching was delivered by trainees in Psychiatry, Obstetrics and Gynaecology and Paediatrics (the ‘specialties’). An online, questionnaire-based cross-sectional study was conducted to assess usefulness and acceptability of the webinar by enrolled students, who were invited to complete the research questionnaire. Student responses pertaining to knowledge, confidence and interest, pre- and post-webinar, were collected and analysed.

Results: A total of 247 students attended the webinar, with a 98.4% response rate to the questionnaire. Ninety-one percent of students agreed that webinars offer flexibility and convenience. About 55.1% felt that the pandemic had impacted their ability to learn new information. About 92.7% felt that the webinar was useful. Matched data showed an increase in participants’ knowledge ($p < 0.001$) and confidence ($p < 0.001$).

Conclusion: Online learning provides a useful, accessible and safe method of providing medical education in the context of the global pandemic. Webinars adopting a lecture-based, examination-style approach improved students’ perceived confidence and knowledge.

Keywords: COVID-19, webinar, medical education, knowledge

Background

The extent to which medical education would be challenged by the emergence of the SARS-CoV-2 virus, which would lead to the worldwide COVID-19 pandemic, was unforeseen.¹ The rapid evolution of the pandemic required educators to adapt and respond to the teaching needs of medical students with little notice. Despite efforts over the last decade to promote individualised education through self-directed and team-facilitated learning outside of the hospital environment,² the disruption to medical education has been pervasive; clinical and practical teaching opportunities have been limited, and the logistical concerns for patient safety have meant that even passive learning opportunities presented to students on their ward

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placements are restricted. The impact of these restrictions on student confidence has been marked, with many expressing concerns about their clinical competency.³ Across the UK and not limited to medical education, large-scale, face-to-face teaching remains impossible due to constantly changing guidance regarding social distancing.⁴ This has directly compromised the traditional lecture-based teaching style that medical students have grown familiar with throughout their training.⁵

Web-based seminars, now better known as “webinars”, are live lectures broadcast over the internet via a number of different host platforms. The convenience of webinars has been acknowledged by the National Health Service (NHS), the Royal Colleges and almost every UK medical school. Where provision of learning content is feasible online, webinars are forming an integral part of modern medical education. Online-accessible learning material may take the form of pre-recorded or live-streamed lectures; the former offers flexibility,^{6,7} and the latter enables real-time interaction between the students and educator(s), preserving an element of active participation.^{8,9}

The benefits of webinars are well recognised; delegates require only an internet connection and a compatible device in order to partake. The minimisation of travel expenses and inconvenience to attendees attracts a wider audience.¹⁰ The clear additional benefit of the use of webinars during the COVID-19 pandemic is a reduction in the risk of transmission of the virus (as it allows adherence to social distancing guidelines). However, the effects of this unprecedented shift towards online teaching and away from the traditional formats of teaching, to which students have become somewhat accustomed, is uncertain. Whilst it is accepted that this change will have social consequences for delegates and students,¹¹ it is unclear whether this vast transformation to online teaching will affect the standard of education being delivered, and the learning experience for the attending student.

In the UK medical school curricula, a significant proportion of either the penultimate or final years of study is dedicated to studying Psychiatry, Obstetrics and Gynaecology and Paediatrics (colloquially referred to as the “specialties”). For the purpose of this study, a collaboration between specialty trainees in each of these three specialty fields enabled the delivery of a one-day revision webinar to medical students who would be revising during the COVID-19 pandemic. The aim of this study was to ascertain the utility and usefulness of a webinar-based revision session via participant’s self-

rated knowledge, confidence and interest both pre- and post-intervention, in order to establish if webinar-based teaching is on par with, or possibly superior to, face-to-face teaching. Review and approval by an ethical committee was not warranted, as this cross-sectional study was an evaluation of teaching intervention.

Methods

We organised a free webinar for fifth and final year medical students using an online video conferencing platform, organised by a specialist team of doctors with experience in medical education. The lecture content was written and delivered by trainees in Psychiatry, Obstetrics and Gynaecology and Paediatrics. We provided a brief introduction into the specialties examination, followed by three lectures in each specialty, each lasting 2 hours. The format of the lecture involved sixty single best answer (SBA) questions with a one-minute timer per question, in keeping with probable examination conditions. Answers were then provided with comprehensive explanations.

The aim was to provide a thorough oversight of examination-style questions with concise explanations, replicating the likely standard of a UK medical school examination paper. Delegates were able to ask questions to the speakers in real-time via the messenger function of the communications platform and these were answered in real-time throughout the webinar, as well as at set intervals.

Students were invited to partake in the study using the mailing list of registered delegates, and were emailed the pre- and post-course questionnaire via an online survey tool. We used Google Forms (Google, USA) as our online questionnaire platform, which stores data in a Google Sheets (Google, USA) encrypted database. This method of administration ensured that each student could only complete the questionnaire once. Students were given several days after the webinar to complete the questionnaire, in order to maximise the response rate.

The questionnaire collected data on student demographics and their medical school. We also collected data on their preferences of webinar-based learning and experiences of learning in the context of the global pandemic. Questions evaluating factors such as self-rated knowledge and confidence were designed with a Likert scale (1 = low, 5 = high). There was an opportunity for delegates to provide written feedback in a free text box.

Data were analysed using SPSS V26 statistical software using non-parametric Wilcoxon matched-pairs rank sum tests to compare pre- and post-course outcomes.

Results

247 students attended the course, with a 98.4% (n = 243) response rate to the questionnaire. Participation was voluntary. Not all questionnaires were completed in full, with an option to leave a section blank if a student did not attend a specific part of the course.

Demographics

Students were represented from 28 of the 41 UK medical schools and one European medical school. Majority

(85.1%, n = 207) of respondents were due to graduate in 2021. Sixty-three percent of respondents were female, whilst 32.9% were male.

Pre-Course Questionnaire

The questionnaire can be seen in Figure 1. Ninety-one percent of students (n = 222) strongly agreed (72.0%, n = 175) or agreed (19.3%, n = 47) that webinars offer flexibility and convenience when compared to travelling or spending money on face-to-face teaching. Over half of

Webinar Course Questionnaire	
Email Address	
Medical School	
Expected year of graduation	
Ethnicity	Black British, Black African Or Black Caribbean White British, White Irish Or White Other Asian British Or Asian South East Asian British Or South East Asian Mixed Ethnicity Prefer Not To Say Other [Freetext]
Gender	Female Male Trans-Female Trans-Male Non-Binary Prefer not to say Other [freetext]
How many webinars have you attended outside of your degree course?	
To what extent do you agree with the following statements?	Likert Scale 1-5 (Strongly Disagree – Strongly Agree)
<ul style="list-style-type: none"> Webinars offer flexibility and convenience with, for example, not having to spend time or money on travelling I feel more confident to ask questions during a webinar compared to face-to-face lectures I prefer webinars to face-to-face lectures I feel that COVID-19 has significantly impacted my ability to learn new information I feel that COVID-19 has significantly impacted my ability to revise 	
Before the course, how confident did you feel about the specialties examination?	Likert Scale 1-5 (Extremely Confident – Not Confident At All)
Before the course, how knowledgeable did you feel about the specialties examination?	Likert Scale 1-5 (Extremely Knowledgeable – Not Knowledgeable At All)
To what extent do you agree with the following statements regarding the event as a whole:	Likert Scale 1-5 (Strongly Disagree – Strongly Agree)
<ul style="list-style-type: none"> The webinar overall was engaging and enjoyable The webinar taught me something I consider valuable The webinar was a useful way of learning in the context of COVID-19 I would find this webinar useful regardless of the current pandemic 	
After the course, how confident do you now feel about the specialties examination?	Likert Scale 1-5 (Extremely Confident – Not Confident At All)
After the course, how knowledgeable do you now feel about the specialties examination?	Likert Scale 1-5 (Extremely Confident – Not Confident At All)
If we did this event again, would you prefer it to be webinar or face-to-face (if possible)	Webinar Face-to-face No preference either way
Any other feedback	

Figure 1 Webinar course questionnaire given to participants.

students (55.1%, $n = 134$) felt that the COVID-19 pandemic had impacted their ability to learn new information (strongly agree: 23.5%, $n = 57$; agree: 31.7%, $n = 77$), whilst there was a mixed view on how the pandemic had impacted their ability to revise (see Figure 2).

Before the course, only 7.0% ($n = 17$) students felt “extremely” or “very” confident about the specialties examination paper. Most students (58.5%, $n = 143$) felt somewhat confident, whilst almost one-third (28.8%, $n = 70$) described that they did not feel that confident. Approximately one in ten (10.7%, $n = 26$) students felt very or extremely knowledgeable about the examination, with the remainder feeling somewhat knowledgeable (72.4%, $n = 176$), not that knowledgeable (14.8%, $n = 36$) or not at all knowledgeable (2.1%, $n = 5$).

Post-Course Questionnaire

Students were asked to evaluate their enjoyment and perceived value of the content course (Figure 3), as well as their perception of the usefulness and utility of a webinar-based learning platform. Of those who responded, 94.6% ($n = 222$) felt strongly (70.2%, $n = 167$) or slightly agreed (16.7%, $n = 58$) that the course was engaging and enjoyable, whilst 94.4% ($n = 190$) strongly (77.8%, $n = 182$) or

slightly agreed (16.7%, $n = 16.7\%$) felt that the course had taught them something they perceived as valuable.

In the context of the COVID-19 pandemic, 92.7% ($n = 215$) of respondents strongly (82.3%, $n = 191$) or slightly agreed (10.3%, $n = 24$) that the webinar was useful, whilst 91.5% ($n = 209$) strongly or slightly agreed that it would be useful regardless of the pandemic.

After the course, students were significantly more confident about the specialties examination (mean confidence 2.69 vs 3.34, $p < 0.001$, IQR 2.0–3.0 vs 3.0–4.0), with 35.4% ($n = 86$) of participants felt “extremely” (3.3%, $n = 8$) or “very” confident (32.1%, $n = 78$) about the examination. There was a significant increase in perceived knowledge of the course (mean knowledge score 2.93 vs 3.47, $p < 0.001$, IQR 3.0–3.0 vs 3.0–4.0). Post-course, 44.9% ($n = 109$) felt “extremely” (4.1%, $n = 10$) or “very” knowledgeable (40.7%, $n = 99$), with the remainder feeling somewhat knowledgeable (53.5%, $n = 130$, not that knowledgeable (1.2%, $n = 3$) or not at all knowledgeable (0.4%, $n = 1$).

Almost two-thirds of students stated that they would like the course to be delivered by webinar if repeated (65.0%, $n = 158$), with 23.0% stating no preference ($n = 56$) and 11.9% preferring face-to-face ($n = 29$).

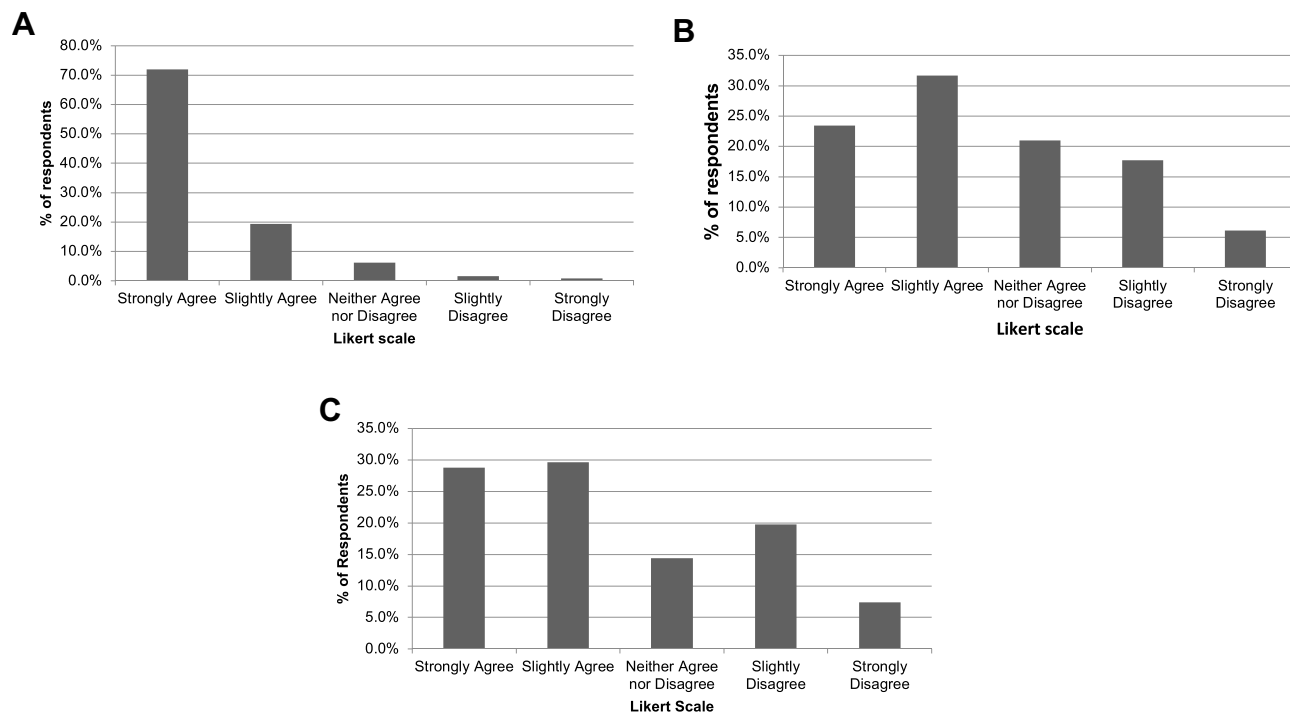


Figure 2 Pre-course questionnaire with graphs demonstrating. **(A)** Participant opinion of webinars as a convenient way of learning; a response to the statement, “Webinars offer flexibility and convenience with, for example, not having to spend time or money on travelling”. **(B)** Impact of COVID-19 on ability to learn new information; a response to the statement, “I feel that COVID-19 has significantly impacted my ability to learn new information”. **(C)** Impact of COVID-19 on ability to revise; a response to the statement, “I feel that COVID-19 has significantly impacted my ability to revise”.

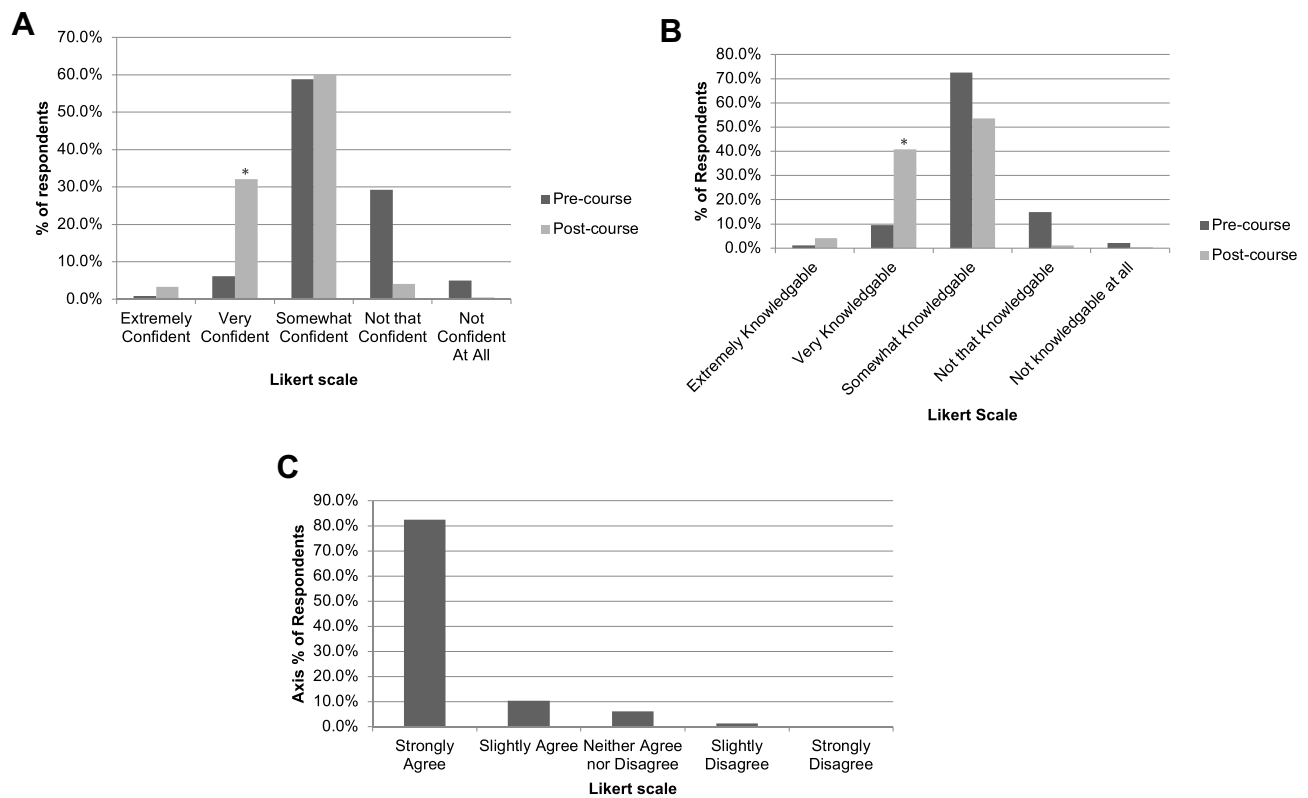


Figure 3 Questionnaire results with graphs demonstrating. **(A)** Pre- and post-course perceived confidence. **(B)** Pre- and post-course perceived knowledge. **(C)** Participant perception of usefulness of webinars in context of COVID-19; a response to the An asterisk (*) denotes statistical significance.

Discussion

This study demonstrated that a diverse group of medical students consider webinars to be a useful, acceptable and effective way of teaching. 91% of students felt that webinars offered greater flexibility and convenience when compared to face-to-face learning, and two-thirds (65.0%) would prefer this method of delivery in the future. This has been mirrored in a 2017 American Association of Medical Colleges study, which found that medical students deem pre-recorded lecture materials to be more useful than attending face-to-face lectures.¹² Moreover, Patel et al reinforced these findings, with 55% of participants at a webinar-based surgical training course preferring webinars to face-to-face tutorials.¹³ This study builds on the existing body of evidence that webinars are an excellent option in the provision of both undergraduate and post-graduate education, and can be extrapolated to meeting educational needs in the context of the COVID-19 pandemic.

It is concerning that over half (55.1%) of students felt that the pandemic had impacted their ability to learn new material. This is pertinent, given that the format of future

clinical examinations may be affected by social distancing measures, with some medical schools having already relied solely on written examination, due to cancellations of practical examinations in the first peak of the pandemic. Webinars may prove to be the mainstay of medical education for the academic year to follow, and this study provides useful insight into their efficacy and reception by students. Any research that exists to explore the role of emergency webinar provision in the context of a pandemic is minimal. However, one unit in India found that an emergency online medical education programme was useful in administering both pre-clinical and clinical teaching to students.¹⁴

There was a significant improvement in perceived confidence and knowledge at all levels after the delivery of the webinar. Prior to the course, only 7.0% of students described feeling “extremely” or “very” confident about the examination, which improved fivefold to 35.4% post-course. Knowledge also improved from one in ten (10.7%) feeling very or extremely knowledgeable to almost half (44.9%) of students feeling very or extremely knowledgeable. Other studies have demonstrated similar findings,

with a meta-analysis of 12 randomised-controlled trials demonstrating that webinars are more effective than face-to-face classroom instruction in higher education training.¹⁵

The vast majority (94.6%) of participants agreed that the course was enjoyable and engaging, whilst 94.4% considered the content to be valuable. A similar 2019 study by Khajuria et al found that their webinar-based medical education course provided a significant increase in knowledge and confidence.¹⁶ This further enforces the benefit of online learning provision independent of the pandemic.

There are, of course, limitations to the provision of medical education online. Commonly recognised issues include technical problems such as a labile internet connection difficulties in displaying presentation slides, participants speaking at the same time and asking questions in real-time.⁸

Where the audience is large, and depending on whether participants turn their webcams on, visual feedback to the presenter is lacking; the perception of non-visual cues from the audience that would normally prompt appropriate breaks and explanations during the session is hindered.¹⁷

Feedback from delegates attending this webinar course revealed that they would appreciate increased breaks due to screen fatigue. This visual discomfort, referred to as asthenopia, can impede efforts to concentrate during teaching.¹⁸ Should the use of webinars prove to be a long-term solution, an evidence-based approach must be taken in the development of an online medical education programme, with institutions providing tailored advice for learning providers in how to optimise the online learning experience.

It is recognised that webinars are cost-effective for the individual and institution, and they may prove to be vital in widening access to medical education in the long term.¹⁹ However, we acknowledge that this model relies on individual students having access to both the internet and a computer or smart tablet. Institutions may need to consider providing equipment in order for a webinar-led education programme to be viable, particularly given that some students may choose to undertake their education from their family homes rather than moving to campus during the pandemic.

Conclusion

This study demonstrates that students find webinars to be a useful, effective and preferable mode of receiving

information in the context of the COVID-19 pandemic. Furthermore, there was a significant increase in rates of confidence and knowledge in the specialties examination as a result of the webinar, with a significant proportion of students regarding the course to be valuable. This suggests that a webinar-based learning system is an effective way of delivering teaching that is acceptable to students. Further work must be done to standardise recommendations for the best format of providing online learning and to develop tools for assessing clinical competency in the event of the cancellation of face-to-face practical examinations.

Ethical Approval

Review and approval by an ethics committee were not required for this research, as this cross-sectional study was an evaluation of teaching intervention.

Disclosure

AK is Chairman of High Yield UK, which is the organisation that advertised this free lecture series. NC, AS, JC and YA declare no conflicts of interest.

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