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The impact of COVID-19 on medical examinations

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Summary. *Background and aim:* The coronavirus-19 (COVID-19) pandemic has had a profound impact on many aspects of our lives, including medical education. The suspension of clinical placements and cancellation of objective structured clinical examinations (OSCE) is likely to have an influence on students' performance. *Methods:* Using a questionnaire, a retrospective observational study was conducted. Our primary focus was 3rd year medical students following their examinations in May 2020. *Results:* Out of 46 responses obtained, the results demonstrated over 2/3 felt they perform better in clinical OSCE compared to written examinations and the majority performed worse this year during the pandemic. On a Likert scale, a mean result of 3/5 was obtained for confidence upon returning to placement and to address this, most stated they would benefit from extra optional teaching. Additionally, a further average of 3.82 was derived to represent how greatly students believed the absence of third year clinical OSCE would negatively impact their performance in the OSCE for the following academic year. Conclusion: The results of our study highlight that the cancellation of clinical placements and OSCE due to coronavirus has negatively impacted on medical education and if we are to be faced with future pandemics, we must be better prepared to train future doctors. (www.actabiomedica.it)

Keywords: Medical Education, Coronavirus, COVID19, OSCE, Medical Examinations, Clinical Education

Introduction

On the last day of January 2020, chief medical officers confirmed the first case of coronavirus (SARS-CoV-2) (1). This novel virus emerged from the city of Wuhan, China and rapidly manifested into a global pandemic. An interruption to daily life due to significant changes since early March when a nation-wide "lockdown" was ensued occurred (2). Public response ranged from denial to panic, perhaps emphasising how unprepared we felt as a nation for a virus taking the lives of 1,445 patients in 24 hours at its peak (3). The measures taken by health authorities across the globe have been to "flatten the curve" and curb the spread of virus through a nation-wide lockdown, social distancing and vigilant handwashing. As the focus shifts to ensure lives are not lost prematurely to COVID-19, most other parts of life have taken a backseat. In critical times like this, we appreciate selfless key workers including nurses and doctors. Thus, we must consider the training of the new generation of healthcare professionals and how COVID-19 has impacted their training and ultimately, future patient care. On the 17th of March, the Association of American medical colleges strongly suggested medical students are not to be involved with patient contact (4). At present, medical schools have postponed all clinical placements, on-site teachings and on-site examinations. Online examinations for medical schools were undertaken and many objective structured clinical examinations (OSCE) cancelled. As

fear grew with the rising death tolls, the general medical council (GMC) offered final year medical students the opportunity to graduate early to aid the NHS (5). What is unique about medical education is the integration of learning with practical application in hospital placements. In fact, this is an essential component of medical training as once medical students graduate, they are absorbed into work immediately with an expected level of competence. Thus, the loss of contact with patients for months is likely to have an impact on confidence and competence. Thereby, ensuring adequate learning strategies and ways to compensate for missed experiences is vital. Despite medical schools having new strategies of remote learning, it is important to emphasise nothing can replace patient contact and practical learning. As stated wisely by William Osler, "he who studies medicine without books sails an uncharted sea, but he who studies medicine without patients does not go to sea at all". The uncertainty of how medical students will be able to obtain enough clinical knowledge and competency to graduate has sparked anxiety in many students. As medical students ourselves, we empathise with how nerve-wrecking the erratic nature of the world is and we decided to ask our fellow peers how they felt the pandemic has impacted their examinations and what implications they feel it may have for their future. The majority of the published data since the pandemic has focused on opinion pieces, we chose to do primary research into effects of COVID19 on medical education and examination.

Materials and Methods

Study design

The study was that of a retrospective observational study. This involved the use of a questionnaire. A total of 46 responses were obtained with emphasis on receiving responses from students in their 3rd year of medical school. This is a pivotal year in medical school whereby, at St George's University of London, it consists of half a year of placement and half a year of problem based/lecture teaching. It combines three cohorts of students, undergraduates on the MBBS5 course, post-graduates on the MBBS4 course and post-graduate transfer students who transition straight into the third year of medical school after completing a biomedical science degree. Focus was on this year group due to the recent completion of their online exams and the importance of grasping clinical skills in 3rd year before entering the 4th year of medical school.

Questionnaire

The questionnaire was produced on Microsoft Forms and circulated for completion online using a shared link. A draft was distributed amongst 5 individuals for an initial review before finalisation. The questionnaires were sent electronically to 3rd year medical students (N=206) at St George's University of London, achieving a total of 46 responses (22% response rate).

The questionnaire included two sections to elicit ideas on both the 'current implications' and 'future implications' of coronavirus on 3rd year examinations and future clinical placements. Each section had five questions. It included a mixture of Likert style questions, multichotomous, dichotomous and one open-ended question.

The questionnaire was designed to ensure participants remained anonymous and the results were strictly confidential. (Appendix A) This questionnaire was validated with each author having looked at it independently, removing errors which may cause bias.

Additionally, a pilot study was performed with 5 students to ensure all the questions are informative. All the data was transferred into an excel file which allowed for the generation of graphs, highlighting trends in responses. Consistency and correlation within the responses emphasise the validity of this questionnaire.

Data analysis

To analyse the results from the questionnaire, Microsoft Excel was initially used. Descriptive statistics on all data were formulated. The key findings were presented in graphical form, such as pie charts and bar graphs.

Results

Current implications

Our study shows that the majority of students believe they perform better in the clinical OSCE (29, 63%) compared to the written exams (17, 37%). Hence, this suggests they felt disadvantaged by the cancellation of the OSCE, Figure 1. Furthermore, Figure 2 corroborates this, reflecting that a greater proportion of students performed worse during remote exams compared to their previous medical academic year. Out of these students over 2/3 felt they perform better in the clinical OSCE compared to the written exams.

Within our cohort, the students achieving 1-2nd decile in their previous academic year made up the greatest proportion of respondents (15, 33%). This may be a confounder affecting the results of whether they performed better or worse this academic year as the individuals in this category can only either re-achieve 1st decile or perform worse than their previous year.

The greatest difficulty faced by students conducting the online examinations was the home environment, Figure 3. Furthermore, they stated their greatest concern regarding the online examinations is the impact their results may have on their foundation programme academic score (FPAS), Figure 4.

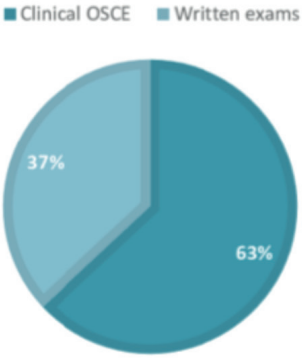

Figure 1. Pie Chart depicting whether students believe they perfrom more strongly in the written medical exams or the clinical OSCE.

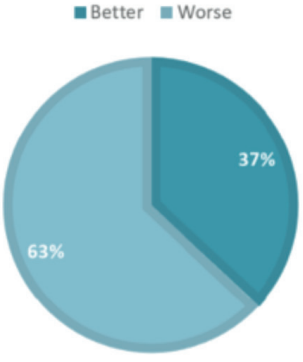

Figure 2. Pie Chart depicting whether students performed better or worse in their medical exams this summer compared to their previous medical academic year.

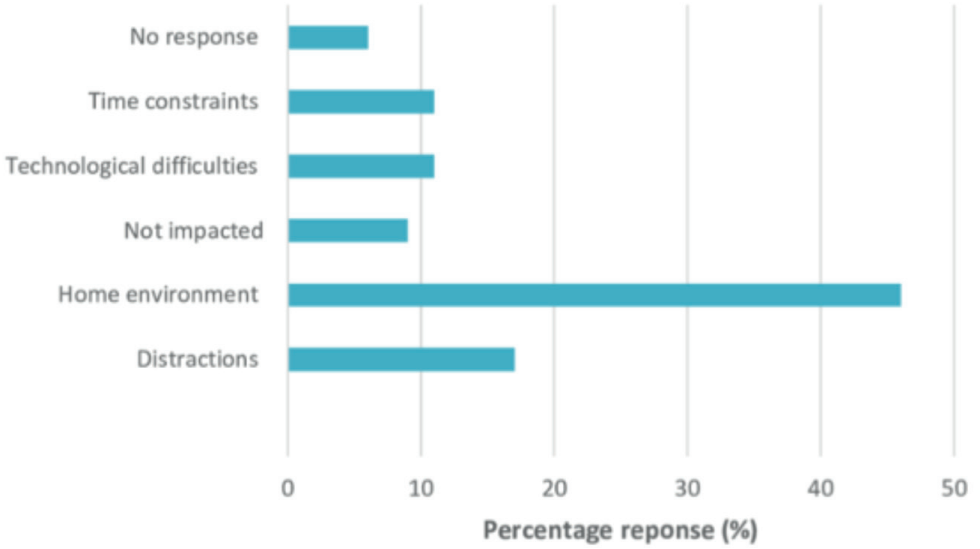

Figure 3. Cluster Chart depicting what students found most difficult about online examinations

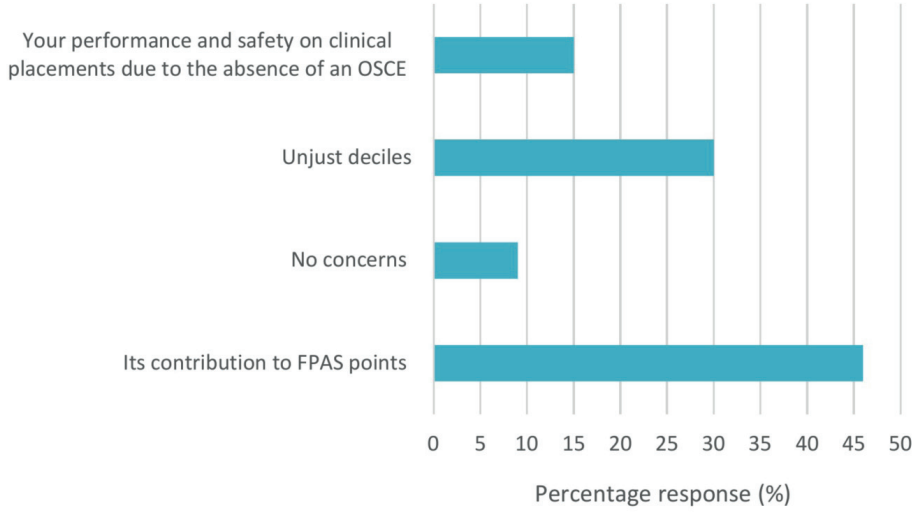

Figure 4. Cluster Chart depicting what students are most concerned about regarding their results from online examinations

Future implications

A mean result of 3 out of 5 on the Likert scale was obtained across the 46 individuals for their confidence levels upon returning to placement. A lack of clinical skills was their greatest concern with a majority response (34, 74%), Figure 5.

In order to help fill the gaps of knowledge and skills the students feel they have obtained due to COVID, it can be concluded that amongst this cohort they would benefit the most from extra optional teaching (34, 74%), Figure 6.

From a rating of 1-5, an average of 3.82 was derived to represent how greatly students believed the

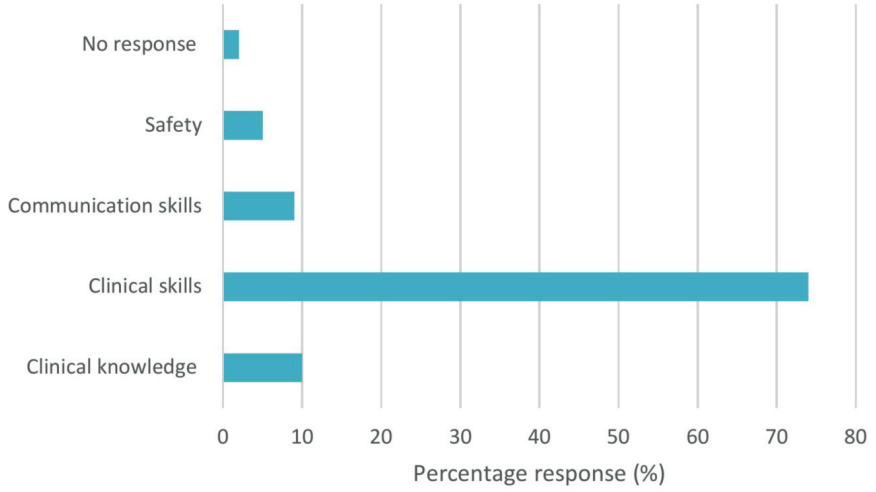

Figure 5. Cluster Chart depicting what students feel they will be lacking the most upon returning to clinical placements

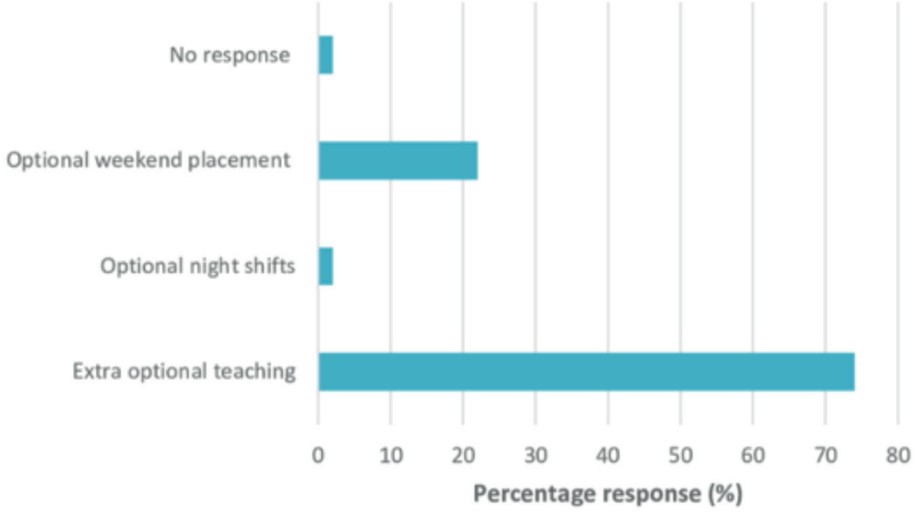

Figure 6. Cluster Chart depicting what students feel would most help their gaps in knowledge and skills due to COVID.

absence of a 3rd year clinical OSCE would negatively impact their performance in their OSCE the following academic year (4th year). This may be due to their lack of confidence returning to placement as a result of less clinical skills knowledge as highlighted above.

To sum up, out of the 46 students, over 2/3 felt they performed better in clinical OSCE compared to written exams. The greatest difficulty of online examinations for most students was the home environment. The greatest concern for students was the impact of their results on their FPAS. A mean result of 3/5 was obtained across the students for their confidence level returning to placement and majority felt they would be lacking in clinical skills upon return. In order to help fill gaps in knowledge and skills, students felt they would most benefit from extra optional teaching.

From a score of 1-5, an average of 3.82 was derived to represent the number of students who believed that the absence of third year clinical OSCE would negatively impact their performance in the OSCE in the following academic year.

Discussion

The results of our study correlate with the findings from various opinion pieces. The most pertinent finding is that the lack of clinical placements has had a negative impact on student's medical education. This is emphasised by Sahi *et al* who describe the importance of bedside teaching with a live patient for not only getting first-hand experience of seeing patient's clinical findings but also understanding the fine art of medicine especially relating to the dynamics of the doctor patient relationship and the wealth of information students can obtain from observing doctors in action (6). There is hope however for future clinical placements to commence as mentioned by Patil *et al,* who focused on the impact of the SARS outbreak in 2003 on medical education in Hong Kong. With the availability of adequate PPE (personal protective equipment) and a clear slogan of 'wear mask, wash hands and control SARS' students were allowed to return to clinical placement (7). If a similar strategy is deployed in UK medical schools this will be beneficial to student's education. However, guidance on medical student's participation in direct contact patient activities published by the Association of American Medical Colleges in April Whelan et al suggests that it may not be as simple as first proposed. Measures such as reasonable turnaround time for COVID-19 testing and availability of supervision should be carefully considered before students return to clinical placements (4). An alternative innovative strategy proposed by Mian *et al*., to allow for social distancing and more patient communication is the use of tablets which can be used to tele-communicate with patients from separate rooms and cleaned in between each patient's use. This can allow for medical students to improve their diagnostic and communication skills, it can also be useful for healthcare professionals to effectively and safely communicate with patients (8).

Another important result from our study was that student's greatest concern regarding online examination was the impact of their results on their FPAS score. In the UK, foundation programme academic performance in medical school (measured in deciles) has significant contribution to a student's score which can determine where within the UK they are placed for their two years of foundation training. The concern with career progression due to the impact of COVID is also mentioned by Ferrel *et al* who also point out that students could miss out on other opportunities such as conference presentations which assist with personal development (9).

Limitations

Whilst our study was useful and unique compared to the literature as it included primary research it still had some limitations which are important to address. The study cohort were students in their third year at St George's university of London. As described previously this year group combines three student cohorts, some of whom had not sat medical school exams beforehand so had no basis to compare academic performance with. Another limitation of our study is that a larger proportion of students (33%) were 1st and 2nd decile in their previous academic year so felt they performed worse this academic year and is not representative of the whole cohort. Furthermore, the questionnaire could have been improved by asking more open questions such as suggestions for improving medical education during COVID-19. An important aspect that has been overlooked is the impact of COVID-19 on student's well-being – specifically their mental health which in turn could affect their academic performance and levels of engagement with medical education. An article by Dadeilia *et al* emphasised the importance of safeguarding mental health during these uncertain times and this could have been explored further in our study (10). Another key aspect of our research that could be improved is considering the importance of student demographics and its impact on medical education during the pandemic period. As for example, students living in remote areas or from lower socioeconomic backgrounds may have more distractions at home impeding their ability to study or do not have access to uninterrupted internet access which

has become essential. Whilst our study focused on the impact of COVID-19 on medical education in one academic year its implications on long term medical education and career progression needs to be explored further to truly assess the impact of the pandemic on medical education.

Future Avenues of Research

Our study could be improved in the future by carrying out a similar questionnaire in a larger, multi-centre study looking at the impact of COVID-19 on medical education in medical schools across the UK and globally. Whilst our study assessed the impact of COVID-19 on medical education in one academic year a prospective study looking at the impact of COVID-19 on future academic performance and career progression would also be useful. Furthermore, our study could be improved to consider the impact of student demographics on academic performance during COVID-19.

Conclusion

The results of our study have shown that COVID-19 has had a drastic impact on medical education and reflects our unpreparedness for this global pandemic. The cancellation of clinical placements has had a negative impact on student's education and if we are to deal with further outbreaks, we must consider how best to use our resources so that education is not disrupted, and we can train a proficient cohort of doctors for future generations. We hope the results of our study and the conclusions we have derived from it will be useful in not only assessing the impact of COVID-19 on medical education but also in coming up with solutions for these situations that consider the perspective of medical students.

Conflict of Interest

Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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Appendix A

Current and future implications of COVID19 on the T year medical student cohort

Current Implications

1.Do you believe you perform more strongly in the written medical exams or clinical OSCE?

- Written medical exams
- Clinical OSCE

2.How did you perform overall in your previous medical academic year?

- 1-2rd decile
- 3-4th decile
- 5-6th decile
- 7-8th decile
- 9-10th decile
- Transfer First class
- Transfer 2:1

3.Did you perform better or worse than your previous medical academic year in your T year exams?

- Better
- Worse

4.What did you find most difficult about online examinations?

- Home environment
- Distractions
- Time constraints
- Technological difficulties
- Not impacted

5.What concerns you the most regarding your current T year results?

- Its contribution to FPAS points
- Your performance and safety on clinical placements due to the absence of an OSCE
- Unjust deciles
- No concerns

Future Implications

6.How confident do you feel on returning to clinical placement (1 = least confident, 5 = most confident)

- 1
- 2
- 3
- 4
- 5

7.What in particular do you feel you will be lacking the most on your return to clinical placements?

- Communication skills
- Clinical skills
- Clinical knowledge
- Safety

8. Why do you feel you will be lacking this in particular? (please write a few words explaining)

9.What do you feel would compensate for this the most?

- Extra optional teaching
- Optional placement during weekends or holiday breaks
- Optional night shifts

10.How greatly do you feel the absence of a clinical T year OSCE will negatively impact you clinical P year OSCE performance? (scale 1-5, 1- least, 5-most)

- 1
- 2
- 3
- 4
- 5