

The Impact of COVID-19 Pandemic on Final Year Medical Students: Single Center Study

Ahmad Ussaid¹, Farwa Pervaiz², Wajid Ali Rafai³, Faisal Amin Baig⁴, Sarwat Hassan Syed⁵, Ahsan Masud⁶

^{1,3} Senior Registrar, Department of Medicine, University College of Medicine and Dentistry, Lahore.

² Medical Officer, Chaudhary Muhammad Akram Teaching and Research Hospital, Lahore,

⁴ Associate Professor, Department of Medicine, University College of Medicine and Dentistry, Lahore.

⁵ Assistant Professor, Department of Otolaryngology, Services Institute of Medical Sciences, Lahore.

⁶ Senior Demonstrator, Department of Medicine, University College of Medicine and Dentistry, Lahore.

Author's Contribution

⁴ Conception of study

² Experimentation/Study conduction

^{1,6} Analysis/Interpretation/Discussion

³ Manuscript Writing

⁵ Critical Review

⁴ Facilitation and Material analysis

Corresponding Author

Dr. Wajid Ali Rafai,

Senior Registrar,

Department of Medicine,

University College of Medicine and Dentistry, Lahore.

Email: wajidalirafai@gmail.com

Article Processing

Received: 28/06/2021

Accepted: 11/12/2021

Cite this Article: Ussaid, A., Pervaiz, F., Rafai, W.A., Baig, F.A., Syed, S.H., Masud, A. The Impact of COVID-19 Pandemic on Final Year Medical Students: Single Center Study. *Journal of Rawalpindi Medical College*. 31 Dec. 2021; 25(4): 499-506.

DOI: <https://doi.org/10.37939/jrmc.v25i4.1717>

Conflict of Interest: Nil

Funding Source: Nil

Access Online:



Abstract

Introduction: The COVID-19 health emergency led to the adoption of unprecedented measures that have never been seen in recent times. The study examines the effect of COVID-19 on final year medical students' final professional examination preparedness, transition to house job, and earlier assistantship.

Materials and Methods: This descriptive cross-sectional survey was conducted in September – October 2020 after institutional review board approval at the University College of Medicine and Dentistry (UCMD) in Lahore, Pakistan. Of a total of 125 final years, medical students 112 responded to the survey questionnaire. Data were analyzed using SPSS 25. The Chi-square test was applied to evaluate the impact of COVID 19 on variables of interest (p-value < 0.05 was considered significant).

Results: Postponement of clinical rotations, written exams, OSPEs, and clinical ward tests was reported by 62%, 78%, 71%, and 48% students respectively whilst 29%, 13%, 18%, and 21% students respectively stated it to be formatted. A statistically significant impact (p < 0.05) was observed for final professional examinations preparedness and confidence to assist earlier.

Conclusion: The study demonstrated the significant impact of COVID-19 on final year medical students' examination preparedness and confidence to assist earlier in the hospital. The improvised teaching methodology is urgently needed to fill in the lapses in their education.

Keywords: COVID-19, Medical Education, Final year MBBS professional examination, OSPE, Earlier Assistantship, House Job.

Introduction

Pneumonia of unknown etiology emerged as an outbreak in Wuhan City, Hubei Province, China in December 2019.¹ In January 2020, World Health Organization (WHO 2020) named the etiological agent as “novel coronavirus 2019” (2019-nCov) responsible for causing this pneumonia-like illness.² COVID-19 was announced as a global pandemic by the World Health Organization (WHO) on March 11, 2020. A SARS-CoV-2 virus is transmitted by respiratory droplets.^{3,4} A study at Wuhan hospital showed SARS-CoV-2 surface and aerosol presence at numerous areas of intensive care and wards. SARS-CoV-2 surfaced up with stronger pathogenicity and rampant transmissibility, proving itself as more infectious than SARS-CoV and MERS-CoV.^{5,6}

The speedy transmission of COVID-19 compelled governments across the globe including the Pakistani government to enforce lockdown, shutting of markets, and closure of all educational activities. This has led to a dramatic impact on educational institutions worldwide particularly affecting medical education where student congregation and patient exposure go hand in hand. Medical colleges as a result have halted their on-campus teaching and shifted to online teaching to bridge the gap.^{7,8}

The pandemic has led to the introduction of new methods of teaching and assessments. There are various components of the curriculum, which led to the learning, and assessment of final year medical students. This has had a unique effect on final year MBBS students where in addition to classroom teaching, bedside teaching in wards is an integral part of the curriculum. These students are undergoing a lifetime transition from being students to doctors.⁹ The main aim of medical professionals is to provide patient care and handle epidemics but their role as a medical educators is also of vital importance. Health professionals in these crisis times of pandemic have been put under great stress and consequently, their job as medical educator has also been impacted. Therefore, hospital clinical rotations ward tests, OSPEs, and written examinations in final year medical students’ lives act coherently to make the doctor of tomorrow.¹⁰ Medical colleges have curtailed clinical contact for students leading up to their final exams to minimize the risk of acquiring the virus. There has been a paradigm shift from traditional teaching methods to online lectures and audio-visual demonstrations for these students.^{7,10}

Online medical education poses many challenges like managing time, using a technological toolkit, examinations, face to face interaction. Time will guide us about the ingenuities for medical education that we will see in the era of the COVID-19 pandemic.¹¹ Therefore, we planned this study to explore the effect of COVID-19 on final year medical students’ education and its effect on their preparedness for the final professional MBBS examination and house job as a consequence. This will furnish treasured understanding for medical colleges on how this global emergency has impacted medical teaching and lessons moving ahead.

Materials and Methods

A descriptive cross-sectional 10-item online questionnaire was circulated to final year medical students after Ethical Review Board approval at the University College of Medicine and Dentistry (UCMD) in Lahore, Pakistan by using google forms. Open-ended, closed-ended, and on a five-point Likert response scale questions were used to collect the data. Participation in the study was voluntary. Non-cooperative students were excluded. Non-probability purposive sampling was used, and a total of 112 students participated out of class strength of 125. The impact of COVID-19 was assessed on hospital clinical rotations, medical written exams, OSPEs, and clinical ward tests for final year medical students and their preparedness for final year professional examination and house jobs. Confidence in regards to an earlier assistantship in the wake of COVID 19 was also evaluated.

Statistical analysis was completed using SPSS 25. Categorical data were computed as frequencies and percentages. Fisher’s exact test was applied to evaluate the impact of COVID 19 on variables of interest and p-value < 0.05 was considered significant.

Results

One hundred and twelve students (n=112) responded to the survey out of the total class strength of one hundred and twenty-five students (n=125). A total of one hundred and twenty students on average graduate per year in this medical school. The effect of COVID-19 on clinical rotations, theory (written) exams, OSPE, and clinical ward tests is shown in Figure 1.

A large number of clinical rotations, written examinations, OSPEs and clinical ward tests were predictably postponed as reported by respondents 62% (n=69), 78% (n=87), 71% (n=79) and 48% (n=54) respectively (Figure 1a-1d). This was followed by format changed to online version as reported by 29% (n=32), 13% (n=15), 18% (n=20) and 21% (n=23) respectively (Figure 1a-1d). However, a relatively small percentage of cohort reported cancellation of clinical rotations by 9% (n=10), written examinations by 4% (n=5), OSPEs by 4% (n=5) and clinical ward tests by 22% (n=25) respectively (Figure 1a-1d). No change was reported by 1% (n=1), 4% (n=5), 7% (n=9) and 9% (n=10) amongst clinical rotations, written examinations, OSPEs and clinical ward tests respectively (Figure 1a-1d).

The participants were additionally evaluated using a five-point Likert scale of agreeable over five components as illustrated in Figure 2. With regards to preparedness for house job, 68% (n=76) 'Strongly agree' and 22% (n=25) 'Agree' for being under-prepared for house job. Whilst evaluating satisfaction to COVID-19 precautions related to changes in

curricula, 29% (n=32) 'Strongly agree' and 50% (n=56) 'Agree' that these precautions were necessary. Thirty-two percent (32%, n=36) 'Strongly agree' and 40% (n=45) 'Agree' that commencing in hospitals earlier than anticipated time would augment their learning opportunities. Taking into account the confidence of the students to assist earlier than anticipated, only 21% (n=24) 'Strongly agree', 27% (n=30) 'Agree' and the majority of the students that is 34% (n=38) remained 'Neutral'.

No statistically significant impact was noted among the factors affecting preparedness for the house job ($p>0.05$). Taking into account the students' preparation for final year examinations, the alterations to clinical rotations and written exams had a significant impact ($p=0.001$ and $p=0.024$ respectively) as presented in Table 1.

Furthermore, whilst evaluating how confident they are to start earlier than anticipated in the hospital, a statistically noteworthy effect was the interruption of clinical rotations and clinical ward tests ($p=0.042$ and $p=0.041$ respectively) as outlined in Table 2.

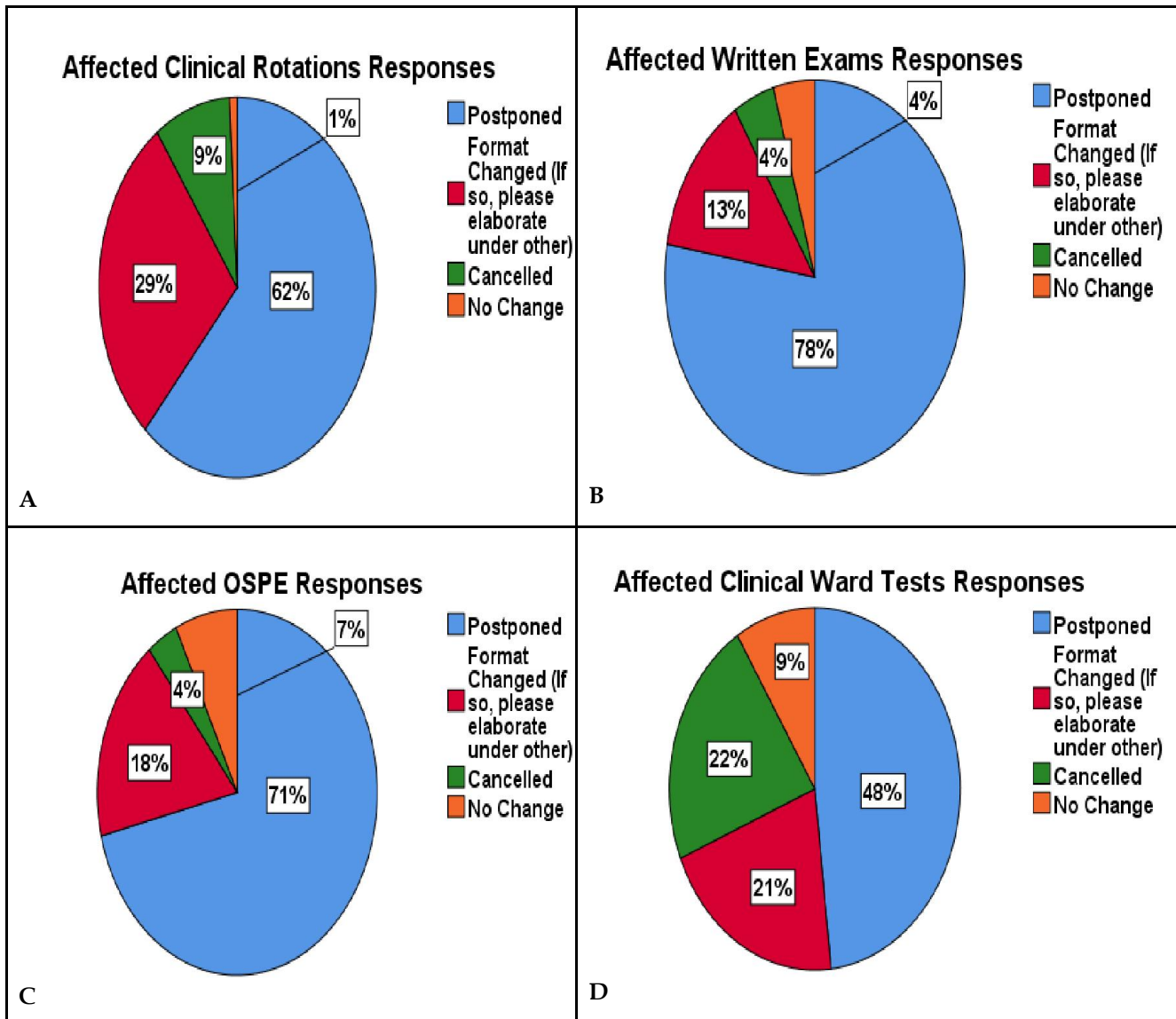


Figure 1: Pie-charts outlining the effect of COVID 19 on medical college (a) Clinical rotations (b) Written Exams (c) OSPE (d) Clinical Ward Tests. (a-d), n = 112

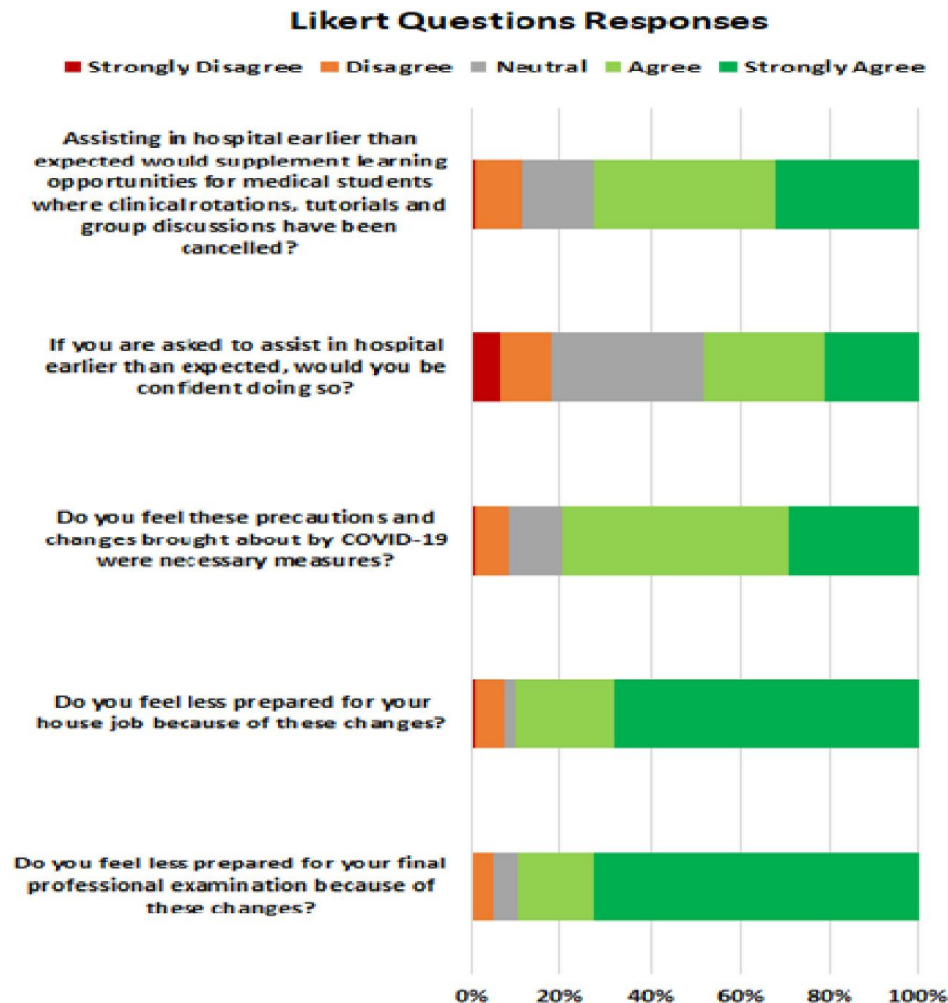


Figure 2: Stacked bar chart of Likert questions illustrating answers by Final year medical students on: supplemented learning following earlier assistance in hospitals, confidence in earlier assistance, satisfaction with COVID-19 precautions, and level of preparedness for exams due to these precautions

Table 1: Factors affecting Preparedness for Final Year MBBS Examinations

Preparedness	Total	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	p-value
Affected: Clinical Rotations							
Postponed	69	5	5	5	10	44	0.001
Format Changed – online format	32	6	5	5	6	10	
Cancelled	10	2	0	0	2	6	
No change	1	0	1	0	0	0	
Affected: Written Exams							
Postponed	87	6	7	6	10	58	0.024
Format Changed – online exam	15	0	0	0	5	10	
Cancelled	5	0	0	1	1	3	
No change	5	0	2	0	1	2	
Affected: OSPE Responses							
Postponed	79	6	5	6	12	50	0.122
Format Changed – online assessment	20	2	5	0	5	8	
Cancelled	4	0	0	1	0	3	
No change	9	3	2	0	1	3	

Affected: Clinical Ward Tests						
Postponed	54	0	3	1	13	37
Format Changed – online video assessment	23	1	2	1	3	16
Cancelled	25	0	0	1	6	18
No change	10	0	2	0	3	5

0.521**Table 2: Factors affecting the Confidence to Assist in Hospitals Earlier**

<i>Confidence</i>	<i>Total</i>	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Neutral</i>	<i>Agree</i>	<i>Strongly Agree</i>	<i>p-value</i>
Affected: Clinical Rotations							
Postponed	69	5	23	10	16	15	0.042
Format Changed – online format	32	6	11	5	5	5	
Cancelled	10	1	6	0	1	2	
No change	1	0	1	0	0	0	
Affected: Written Exams							
Postponed	87	5	8	29	18	27	0.567
Format Changed – online exam	15	2	3	0	5	5	
Cancelled	5	1	1	0	1	2	
No change	5	0	3	0	1	1	
Affected: OSPE Responses							
Postponed	79	5	9	24	20	21	0.476
Format Changed – online assessment	20	5	5	8	3	8	
Cancelled	4	0	2	1	0	1	
No change	9	4	3	0	2	0	
Affected: Clinical Ward Tests							
Postponed	54	8	18	6	16	6	0.041
Format Changed – online video assessment	23	5	7	1	5	5	
Cancelled	25	5	10	0	5	5	
No change	10	3	5	1	1	0	

Discussion

Our study showed hospital clinical rotations and clinical ward tests having a significant impact on the students' final professional examination preparation and the confidence going into earlier assistantship in the hospital. The effect on the preparation for the house job did not display a statistically significant impact that was unexpected. One possible explanation of this was that the students in final year are more concerned and focused on their professional examination as they cannot progress to a house job without passing it. Secondly, students at mid-way of their final year study do not realize the impact on their house job preparation.

The majority of students reported a notable impact on hospital clinical rotations, written exams, OSPE, and clinical ward tests in our study, which was similar to the findings in a study conducted on medical students in the penultimate year of medical school at Ghent and

Leuven University, Belgium.¹² It was also in accordance with the findings in a national survey conducted in the United Kingdom apart from written exams, which were not significantly affected.¹³ The effect of an ongoing pandemic on OSPEs, written exams, and student assistantship remarkably disrupted students' readiness for foundation year training in a survey (respectively $p = 0.025$, 0.008 , 0.0005)¹³, while in our study effect of COVID-19 on hospital clinical rotations, written exams, OSPEs and clinical ward tests had no significant impression ($p > 0.05$) on students' preparedness for house job. Findings of format changing to online classes in our study were consistent with the research carried out in Germany.¹⁴

In our study, hospital clinical rotations being affected by COVID-19 had the most remarkable impact on final professional examination ($p = 0.04$) and assistantship in hospital ($p = 0.001$) comparable to observations in a study (37%, $p < 0.05$) conducted in our neighboring country India.^{15,16} About confidence in assisting earlier

than anticipated in hospital, 48.2% of our study population felt confident which was quite in line with already published literature.¹⁷⁻²⁰

Limitations

There are a few limitations of our study. The students' responses were recorded at one time when in Lahore, Pakistan the first wave of COVID-19 pandemic had begun to decline. We did not record any follow-up responses from students going into the examinations & house jobs. Subsequently, the effect of COVID-19 on medical teaching, in the long run, could not be assessed. Another important limitation was that it was a single-center study with small sample size, so it is not representative of all final year MBBS students in Pakistan. Moreover, our study population had uninterrupted access to well-organized online medical education during the suspension of on-campus and in-hospital teaching. This is not being the case in all the medical colleges across Pakistan because of technological and logistical limitations. There are 169 medical and dental colleges registered with the Pakistan Medical and Dental College and many of them do not have dedicated information technology department (IT). Another limitation while assessing the preparedness of students for house jobs was that it was being evaluated before students appeared in the final professional examination. Medical students have to pass their final professional examination before even commencing the process of house job allocation and their focus would be passing the final examination. They may not realize the actual impact of the pandemic on their house job preparation.

Recommendations

1. Contingency teaching plans should be applicable in the face of such pandemics in order to minimize interruptions in students' education.
2. Improvisation in online teaching format will be required in order to fill in the gap created by the pandemic and to resurface the confidence of the students in regards to their preparedness for different format examinations.
3. Clinical rotations/ward classes to be conducted with strict COVID safety precautions in order to minimize the clinical hands-on experience to the students.

4. Students and teaching faculty's regular feedback and suggestions should be actively sought by managers of medical education at the institute along with close supervision to achieve the goal of making competent doctors even in times of crisis.
5. More studies with a larger sample size such as multi-institutional study should be carried out with an analytical type of study such as comparing before and after examinations to determine the more predictable effect size.

Conclusion

The COVID-19 has had extraordinarily affected medical teaching in Pakistan. A large proportion of medical graduates feel underprepared for final professional examination and hospital assistantship, whereby interruptions to hospital clinical rotations and ward tests had a noteworthy impact on students' readiness. A notable number of students felt optimistic in helping the manpower in the hospital during this health emergency, despite being underprepared. Medical colleges' and hospitals' managers should keep in mind the COVID-19 induced uncertainty to the Final year MBBS students' confidence and readiness. This pandemic has served as a catalyst to explore new avenues in medical education. Medical educators will learn more lessons in times to come by to handle times like this in medical education.

References

1. Lu H, Stratton CW, Tang Y-W. The Wuhan SARS-CoV-2-what's next for China. *J Med Virol.* 2020;92(6):546-7. <https://doi.org/10.1002/jmv.25738>
2. World Health Organization (30 January 2020). Novel Coronavirus (2019-nCoV): situation report, 10 (Report). World Health Organization. [hdl:10665/330775](https://doi.org/10.1066/330775).
3. Cucinotta D, Vanelli M. WHO declares COVID-19 a pandemic. *Acta Biomed.* 2020;91(1):157-60. <https://doi.org/10.23750/abm.v91i1.9397>
4. Sommerstein R, Fux CA, Vuichard-Gysin D, Abbas M, Marschall J, Balmelli C, et al. Risk of SARS-CoV-2 transmission by aerosols, the rational use of masks, and protection of healthcare workers from COVID-19. *Antimicrob Resist Infect Control.* 2020;9(1):100. <https://doi.org/10.1186/s13756-020-00763-0>
5. Anderson EL, Turnham P, Griffin JR, Clarke CC. Consideration of the aerosol transmission for COVID-19 and public health. *Risk Anal.* 2020;40(5):902-7. <https://doi.org/10.1111/risa.13500>
6. Epidemiology Working Group for NCIP Epidemic Response, Chinese Center for Disease Control and Prevention. The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China. *Zhonghua Liu Xing Bing Xue Za Zhi.* 2020;41(2):145-51. <https://doi.org/10.3760/cma.j.issn.0254-6450.2020.02.003>

7. Ahmed H, Allaf M, Elghazaly H. COVID-19 and medical education. *Lancet Infect Dis.* 2020;20(7):777–8. [https://doi.org/10.1016/S1473-3099\(20\)30226-7](https://doi.org/10.1016/S1473-3099(20)30226-7)
8. Ferrel MN, Ryan JJ. The impact of COVID-19 on medical education. *Cureus.* 2020;12(3):e7492. <https://doi.org/10.7759/cureus.7492>
9. Sandhu P, de Wolf M. The impact of COVID-19 on the undergraduate medical curriculum. *Med Educ Online.* 2020;25(1):1764740. <https://doi.org/10.1080/10872981.2020.1764740>
10. Tokuç B, Varol G. Medical education in turkey in time of COVID-19. *Balkan Med J.* 2020;37(4):180–1. <https://doi.org/10.4274/balkanmedj.galenos.2020.2020.4.003>
11. Rajab MH, Gazal AM, Alkattan K. Challenges to online medical education during the COVID-19 pandemic. *Cureus.* 2020;12(7):e8966. <https://doi.org/10.7759/cureus.8966>
12. Kapila V, Corthals S, Langhendries L, Kapila AK, Everaert K. The importance of medical student perspectives on the impact of COVID-19: Medical student perspectives on the impact of COVID-19. *Br J Surg.* 2020;107(10):e372–3. <https://doi.org/10.1002/bjs.11808>
13. Choi B, Jegatheeswaran L, Minocha A, Alhilani M, Nakhoul M, Mutengesa E. The impact of the COVID-19 pandemic on final year medical students in the United Kingdom: a national survey. *BMC Med Educ.* 2020;20(1):206. <https://doi.org/10.1186/s12909-020-02117-1>
14. Loda T, Löffler T, Erschens R, Zipfel S, Herrmann-Werner A. Medical education in times of COVID-19: German students' expectations - A cross-sectional study. *PLoS One.* 2020;15(11):e0241660. <https://doi.org/10.1371/journal.pone.0241660>
15. Patil P, Chakraborty S. Where does Indian medical education stand amidst a pandemic? *J Med Educ Curric Dev.* 2020;7:2382120520951606. <https://doi.org/10.1177/2382120520951606>
16. O'Byrne L, Gavin B, McNicholas F. Medical students and COVID-19: the need for pandemic preparedness. *J Med Ethics.* 2020;46(9):623–6. <https://doi.org/10.1136/medethics-2020-106353>
17. Patel VM, Dahl-Grove D. Disaster preparedness medical school elective: Bridging the gap between volunteer eagerness and readiness. *Pediatr Emerg Care.* 2018;34(7):492–6. <https://doi.org/10.1097/PEC.0000000000000806>
18. Farooq F, Rathore FA, Mansoor SN. Challenges of online medical education in Pakistan during COVID-19 pandemic. *J Coll Physicians Surg Pak.* 2020;30(6):67–9. <https://doi.org/10.29271/jcpsp.2020.Supp1.S67>
19. Nepal S, Atreya A, Menezes RG, Joshi RR. Students' perspective on online medical education amidst the COVID-19 pandemic in Nepal. *J Nepal Health Res Counc.* 2020;18(3):551–5. <https://doi.org/10.33314/jnhrc.v18i3.2851>
20. Singh K, Srivastav S, Bhardwaj A, Dixit A, Misra S. Medical education during the COVID-19 pandemic: A single institution experience. *Indian Pediatr.* 2020;57(7):678–9. <https://doi.org/10.1007/s13312-020-1899-2>