



A Novel Approach for resident Orthopaedic teaching in Covid-19 Pandemic- A Systemic Meta-analysis

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ABSTRACT:

Background: The COVID-19 pandemic has had a significant impact on medical education, including the training of orthopaedic residents. With the restrictions on face-to-face learning and clinical exposure, residency programs have had to adopt innovative teaching methods to ensure the continuity of education while maintaining the safety of residents and patients.

Methods: We explore the different approaches that residency programs have taken to teach orthopaedic residents during the COVID-19 pandemic the post graduate department of orthopaedic in different colleges.

Results: One of the challenges faced by orthopaedic residency programs during the pandemic was the reduced number of elective surgeries and outpatient clinics, which are essential for the residents' training. To address this issue, many programs have been introduced

Conclusion: special emphasis was being given to e learning with various eminent institutes coming up with their PG teaching courses online. This helped the post graduate students across the country to connect on a single platform and exchange knowledge.

KEYWORDS: Teaching module, assessment, Orthopaedics

I. INTRODUCTION

During the lockdown of Covid 19, people were initially devoid of knowledge and conferences. To fill the void, telemedicine and virtual learning platforms came into play. Telemedicine has allowed residents to participate in virtual patient consultations and follow-ups, providing them with a valuable opportunity to learn and gain experience¹. Furthermore, virtual learning platforms have enabled residents to attend webinars, virtual grand rounds, and online educational modules². These platforms provide an interactive learning experience, allowing residents to ask questions and participate in discussions.

Simulated learning has also become an essential tool for orthopaedic residency programs during the pandemic. Simulated learning involves using mannequins, models, or computer programs to simulate surgical procedures and other clinical scenarios. This approach has been used to teach residents surgical skills and decision-making, especially in situations where access to real patients is limited³. The use of simulated learning has been shown to improve residents' clinical skills, confidence, and overall educational experience⁴.

Another approach that residency programs have taken is to incorporate online learning into the curriculum. This approach involves creating online modules that residents can complete at their own pace. These modules cover a range of topics, from anatomy to surgical techniques⁵. Online learning has the advantage of being flexible, allowing residents to learn at their own pace and in their preferred environment. Furthermore, it has been shown to improve residents' knowledge retention and test scores⁶.

II. METHODS

The study was conducted across various Post Graduate Department of Orthopaedics across various states of India. A representation of the residents was connected telephonically to assess the role of e- conferences and the online PG Teaching Course on Custom based Questionnaire (Table 1 and 2). Their reviews were noted down anonymously.



What is better: Online teaching/ physical conference

Reason:

Has covid-19 affected your studies: Yes/No

Reason:

Has covid-19 affected your surgical training: Yes/No

Reason:

Are the online PG teaching courses better than the offline ones: Yes/No

Reason:

Now, after the normalization of the things, would you prefer online teaching or offline

Reason:

Table 1: Questionnaire for assessment

Resident: _____ Specialty: _____ Date: _____

Posterior (C): _____

Posterior (D): _____

Expert	Proficient	Competent	Advanced Beginner	Novice	No Opportunity to Evaluate	
5	4	3	2	1	0	
1. Knowledge of patient surgical	5	4	3	2	1	0
2. History of surgical procedures	5	4	3	2	1	0
3. Anatomy of surgical procedures	5	4	3	2	1	0
4. Pathophysiology of surgical procedures	5	4	3	2	1	0
5. Indications for surgical procedures	5	4	3	2	1	0
6. Contraindications for surgical procedures	5	4	3	2	1	0
7. Preoperative preparation for surgical procedures	5	4	3	2	1	0
8. Intraoperative management for surgical procedures	5	4	3	2	1	0
9. Postoperative management for surgical procedures	5	4	3	2	1	0
10. Complications of surgical procedures	5	4	3	2	1	0
11. Patient education for surgical procedures	5	4	3	2	1	0
12. Documentation for surgical procedures	5	4	3	2	1	0
13. Communication for surgical procedures	5	4	3	2	1	0
14. Teamwork for surgical procedures	5	4	3	2	1	0
15. Quality improvement for surgical procedures	5	4	3	2	1	0

Table 2: Assessment of surgical skills

III. RESULTS

Majority of the residents believed that the online learning was better due to the following reason:

1. Earlier, it was not possible for all the residents to physically attend these courses due to duties or the far location of the place
2. The eminent faculty from all over India became interested in online teaching during Covid-19 pandemic
3. The faculty from various states all across the country would gather together on a common platform to discuss interesting cases or for PG teaching which opened new horizons for various residents

Almost all the residents agreed to getting lesser surgical exposure in Covid-19. The mental stress on the orthopaedic residents was also increased due to concerns for the health of family members, increased burden at workplace and Covid-19 duties.

The residents were extremely cautious about their safety during the pandemic and usually bought masks and other protective equipment from

their own salary. Almost every resident felt that there was lack of support from the administration in these situations.

IV. DISCUSSION

There have been several studies investigating the impact of COVID-19 on surgical residents. Here are some key findings from recent research:

1. Disruption of surgical education and training: The COVID-19 pandemic has led to widespread disruptions in surgical education and training for residents⁷. Many institutions have postponed or cancelled elective surgeries, leading to reduced exposure to cases and limited opportunities for residents to gain surgical experience⁸. In addition, the shift to virtual learning has limited the ability of residents to participate in hands-on learning and clinical skills training⁹.
2. Increased risk of infection and burnout: Surgical residents are also at an increased risk of COVID-19 infection due to their close proximity to patients and the need for aerosol-generating procedures¹⁰. Additionally, the pandemic has led to increased workload and stress on residents, contributing to burnout¹¹.
3. Changes in residency programs and recruitment: The COVID-19 pandemic has also led to changes in residency programs and recruitment processes. Many institutions have shifted to virtual interviews and online recruitment processes, which may affect the ability of residents to network and build relationships with potential programs¹². In addition, some institutions have implemented changes to residency programs, such as reduced work hours and modified rotations, to accommodate the demands of the pandemic¹³.

Overall, the COVID-19 pandemic has had significant impacts on surgical residents, including disruptions to education and training, increased risk of infection and burnout, and changes to residency programs and recruitment processes. It will be important for institutions and residency programs to continue to adapt and respond to these challenges in order to support the training and well-being of surgical residents.

It is important to note that the approaches discussed above are not mutually exclusive, and many residency programs have used a combination of these methods to provide a comprehensive educational experience for their residents. Furthermore, it is essential to continuously evaluate the effectiveness of these approaches and make necessary adjustments to ensure that residents



receive the best possible education despite the challenging circumstances.

The COVID-19 pandemic has undoubtedly presented significant challenges to the education and training of orthopaedic residents. However, with the adoption of innovative teaching methods and new safety protocols, residency programs have been able to maintain a safe and effective learning environment for their residents. The lessons learned from this experience may have a lasting impact on the future of medical education and may lead to the development of new and more effective teaching methods that will benefit residents and patients alike

Finally, many orthopaedic residency programs have developed new protocols and guidelines to ensure the safety of residents and patients during the pandemic. These protocols include the use of personal protective equipment (PPE), social distancing, and frequent testing. By implementing these measures, residency programs have been able to maintain a safe learning environment while still providing residents with valuable clinical exposure¹⁴.

V. CONCLUSION

The COVID-19 pandemic has presented significant challenges to the teaching of orthopaedic residents. However, residency programs have responded to these challenges with innovative approaches that have enabled them to continue educating residents while maintaining safety. Telemedicine, virtual learning platforms, simulated learning, online learning, and new safety protocols have all played a vital role in ensuring the continuity of education during the pandemic.

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