

# COVID-19 Pandemic and the Opportunities for Respiratory Therapy in India: A Narrative Review

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## Abstract

COVID-19 pandemic has been a global health concern since the beginning of 2020. Many individuals suffered and lost their lives, making it a considerable burden on the healthcare systems in their countries. Healthcare professionals worked beyond their limits to cater to the needs of the patients, working against the constraints of a workforce shortage. Many doctors and other allied health professionals also lost their lives. Although the medical and allied health education suffered during the pandemic, it has also provided respiratory therapists (RTs) several opportunities to prove themselves. There was a huge demand for RTs, and they were able to help inpatient management and save lives. RTs were also able to contribute to the capacity building of their juniors and other healthcare professionals. Hands-on work and the use of blended learning strategies during the pandemic proved to be a boon for respiratory therapy education and training. Ongoing updates on innovation, research, and new knowledge generated by the international community enhanced the learning of RTs. RTs became a recognized workforce during the pandemic, and their demand grew substantially. Overall, the COVID-19 pandemic offered the RTs opportunities to grow and evolve. This narrative review highlights the opportunities presented by the COVID-19 pandemic and its impact on the evolution of RT in India.

**Keywords:** Benefits, COVID-19, challenges, respiratory education, respiratory therapy

## INTRODUCTION

The COVID-19 pandemic has disrupted the world since December 2019, ever since the World Health Organization declared it a pandemic after the sudden rise in the COVID-19 cases and deaths on March 11, 2020.<sup>[1]</sup> Globally, as of January 19, 2022, 332 million people have been infected, and 5.5 million died from COVID-19.<sup>[2]</sup> India also bore the brunt of this pandemic, and during the first wave of the pandemic, in 2020, 10 million people were affected, and 149,435 people succumbed.<sup>[2]</sup> Apart from the deaths of patients, many front-line workers also lost their lives on duty.<sup>[3]</sup> India's economy too suffered.<sup>[4,5]</sup>

India saw a surge in cases from March 2020, and the peak of the first wave was seen in September 2020.<sup>[2]</sup> After the continuous efforts of the healthcare professionals and utilization of techniques such as social distancing, handwashing, wearing of masks, and directives from the government to lock down and stay at home, the cases plateaued and reduced.<sup>[2]</sup> Unfortunately, the second wave of COVID-19 in India was seen soon thereafter. As of January 19, 2022, 37.9 million

Indians have been infected, and among those, 487,202 died.<sup>[2]</sup> The highest number of active cases in a day recorded was 414,188 on May 7, 2021.<sup>[2]</sup>

All this put tremendous pressure on the healthcare system and its stakeholders. The human healthcare resource worked overtime to cope with the increasing burden of patients. There also has been a shortage of healthcare professionals.<sup>[6,7]</sup> Junior doctors and paramedics were put on duty, who, although lacked the requisite experience, had a tremendous opportunity to have hands-on experience and further hone their clinical and practical skills.

There has been an impact on medical education due to the COVID-19 pandemic in India.<sup>[8-10]</sup> Like medicine, respiratory

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therapy is also a clinical skill-oriented profession requiring didactic and competency-based education. Respiratory therapists (RTs) are trained to perform all needed activities to support a respiratory patient. COVID-19 pandemic may have affected RT education, training, and consequently practice. Despite that, they rose to the occasion and provided exceptional service to the patients saving many lives. RTs became recognized specialists in India. Several new avenues opened up for RTs to make a difference. Thus, this narrative review highlights the opportunities presented by the COVID-19 pandemic for respiratory therapy in India.

## OPPORTUNITIES FOR RESPIRATORY THERAPY IN INDIA

RTs have been an allied health force in India, supporting doctors as pillars in respiratory disease management. They have been undergoing formal training in India since 1995.<sup>[11]</sup> Today, 47 institutions and universities offer formal degree or diploma programs and train RTs in the country.<sup>[12]</sup> Before the COVID-19 pandemic, RTs worked in and around their educational institutions, mainly in the country's southern states.<sup>[11]</sup> However, the COVID-19 pandemic was a blessing in disguise as it presented unique opportunities for RTs. The doctors realized the importance of having a trained RT to manage the patients. The health ministry acknowledged the importance of RTs during the pandemic and invited all human healthcare resources to work and train other personnel when the patient load was exponentially rising.<sup>[13-20]</sup>

### Perceived need and a change in the role of respiratory therapists

The need for a trained healthcare professional was felt more than ever during the COVID-19 pandemic. RTs suddenly came into the limelight, and the demand for a trained RT increased. The Government of India created a database platform that linked volunteers of various social organizations, civil society representatives, and local administrations to offer support during the pandemic. 1.25 crore individuals, including doctors, nurses, other allied health professionals, accredited social health activists and auxiliary nurse midwife workers, National Cadet Corps and National Service Scheme representatives, and volunteers of professional associations, started offering support at the local level.<sup>[17]</sup> RTs with considerable clinical experience, academicians, researchers, and those willing to volunteer their time and skills were invited to be a part of a task force group. This task force of RTs was created to share knowledge and experience and support each other during critical times. The support of this task force was also extended to other healthcare professionals who needed it. This created a sense of bond and unity among the small group and perhaps enhanced practice. The names and details of the members of this task force were shared with the Ministry of Health and Family Welfare, Government of India's COVID Warriors database.<sup>[19]</sup> The details of these members are still available online for hospitals and clinics managing COVID-19 patients.

This rise in RT's demand increased the workload of existing RTs and brought a significant transformation in the roles and responsibilities. Apart from routine COVID-19 management in the intensive care unit (ICU), they also helped patients in the postinfective phase by monitoring at home, pulmonary rehabilitation, and online consultations.<sup>[21]</sup> There is a massive potential for RTs to provide telehealth services on a larger scale using innovative systems currently and in the future.<sup>[22]</sup> RTs with more experience were delegated more complex and critical thinking tasks, leading them to assume leadership roles at their respective workplaces.

### Capacity building

The service they provided as practitioners was one of the most significant contributions that the respiratory therapy community made to the Indian healthcare system. At the same time, the leaders among RTs came together to up skill RTs and other healthcare professionals through capacity-building workshops. Experienced RTs were invited as guest speakers or faculties to teach other healthcare professionals about respiratory therapy-related components, such as mechanical ventilation strategies, airway management, and oxygen therapy.

On a national scale, COVID-19-centered 2-day training courses were conducted online by the Indian Association of Respiratory Care (IARC), along with major medical institutions from various parts of the country. These workshops were open to all healthcare professionals. More than 2000 healthcare professionals, including doctors, nurses, and physiotherapists, attended these training.

Conducting these capacity-building activities sheds more light on the RTs and the level of expertise. Looking at the tremendous work done during the pandemic, a group of senior RTs was given the opportunity to be a part of the basics of the COVID-19 module development project for human resources and capacity building initiated by the Ministry of Health and Family Welfare, along with the Department of Personnel and Training, Ministry of Personnel, Public Grievances and Pensions, Government of India.<sup>[18]</sup> Two of the senior RTs were part of the team that developed the module and received the opportunity to speak during the dissemination program of the above module.<sup>[20]</sup>

### Role of Indian Association of Respiratory Care

The pandemic provided a multitude of opportunities for IARC to distinguish themselves from others and its role expanded beyond its existing activities. Despite being a small group, a few senior RTs took it upon themselves to drive the profession to the next level. This leadership inculcated a sense of worth among the junior RTs, and together through their service, they committed to support the healthcare systems and save lives. IARC also pioneered capacity-building activities as described above.

### Novel learning approaches for students

The majority of the universities had completed teaching some part of the portion before the lockdown was announced.

After the lockdown announcement, the teachers' need to change teaching strategies allowed them to adopt a different approach from the traditional classroom-based education model to the blended learning model.<sup>[23]</sup> This allowed the teacher to incorporate different virtual learning strategies. Even though this method could not provide students with practical experience, they benefitted from direct access to the online resources shared, such as notes and presentations, which they could refer to again. Studies have shown that blended learning, which includes in-person classroom learning plus online learning, can be as effective or even better compared to traditional classroom-based education in health professions.<sup>[24,25]</sup> Online assessment strategies were adopted to evaluate the students. Institutions used innovative methods to evaluate the student's progress moving away from traditional assessments.<sup>[26,27]</sup> Although there are very little data available on assessments during the pandemic, the few that are present report a positive response from the students about the online mode of assessments.<sup>[26,27]</sup>

### **Innovation, research, generation, and use of new knowledge**

At the beginning of the COVID-19 pandemic, there were no set guidelines available on the management of patients. Furthermore, there is a lack of evidence-based guidelines and literature for respiratory therapy in India.<sup>[11]</sup> This pandemic provided an excellent opportunity for RTs to showcase their talents and devise and adopt innovative strategies to manage patients. It allowed them to do pioneering research work independently and with research teams looking into various aspects of respiratory therapy for COVID-19. This led to the generation of new knowledge and the need for a continuous update by the healthcare community, including respiratory therapy. It was an opportunity for the therapists to learn new skills and apply the known information in the management of patients. High-flow nasal cannula (HFNC) therapy that had a limited use in the neonatal population played a major role in the management of adult patients during the pandemic.<sup>[28]</sup> RTs efficiently managed the patients with COVID-19-related hypoxemic failure using HFNC. They used new scoring systems such as the heart rate, acidosis, consciousness, oxygenation, and respiratory rate (HACOR) score to predict noninvasive ventilation failure and the need for intubation, and respiratory rate-oxygenation (ROX) index for HFNC failure.<sup>[29-31]</sup> By following the guidelines set by the Pre-Conception and PreNatal Diagnostic Techniques Act, 1994, RTs were trained to use point-of-care ultrasound (POCUS) for diagnosis and monitoring of lung diseases during the pandemic as research indicates a better diagnostic accuracy with ultrasound compared to chest X-rays.<sup>[32-34]</sup> The use of POCUS also avoided the risk of spread of infection and the necessity of intense infection control measures during procedures such as chest X-ray and computed tomography.<sup>[34,35]</sup> Thus, the use of the simple yet objective scoring systems and advanced technology was incorporated in daily practice. RTs were asked to take decisions regarding implementation of different

weaning strategies based on diaphragmatic ultrasound, as corticosteroids used in COVID-19 therapy with prolonged ICU care often lead to critical illness myopathy.<sup>[36,37]</sup> Further, the use of prone positioning technique to improve oxygenation and ventilation in intubated and nonintubated patients was extensively practiced by RTs and other healthcare professionals during the pandemic.<sup>[38,39]</sup> They were compelled to think outside the box and use the resources smartly. Some also published original articles, review papers, and case reports during the pandemic.<sup>[6,40]</sup> The senior RTs came together and created quick reference guides for everyone to use.<sup>[41]</sup> The use of technology also aided their work in patient management. The use of artificial intelligence and artificial intelligence-based algorithms was also explored during the pandemic in disease management and training.<sup>[42]</sup>

### **International help and involvement**

Indian RTs working in the Middle Eastern countries came forward to support their fellow RTs working in India. They shared their experiences and guided the junior RTs and students on the management of patients. They also conducted online sessions for everyone.

RTs from overseas countries such as Canada, Spain, the United States of America, and China also supported the therapists working in India. They shared educational resources as well as suggested strategies to manage patients. Due to this, therapists in India who had access to the latest information were exposed to new medical devices and practices across different countries. This was a chance for RTs to receive international recognition and prove their mettle among their peers.

## **POTENTIAL CHALLENGES OF RESPIRATORY THERAPY EDUCATION DUE TO COVID-19 PANDEMIC**

Although this article focuses more on the opportunities that allowed RT to be a focus of the healthcare fraternity, we would like to mention the challenges faced during the pandemic.

### **Skill training**

Respiratory therapy is a skill-based profession where all the competencies require hands-on practice to learn, similar to medicine. Although the online teaching method can effectively impart theoretical knowledge, it cannot provide the learner with the hands-on experience needed.<sup>[43]</sup> There is a plenty of literature supporting the importance of practical training, including simulation-based experience, as it greatly benefits the learners.<sup>[44-47]</sup> This was a big challenge that RT students faced due to the pandemic.

### **Technological challenges**

Students faced technological challenges while undergoing online training during the pandemic. Issues such as internet connectivity, lack of a smartphone or computer, and device malfunction may have hindered students' learning ability.<sup>[48,49]</sup> Another significant issue is the inability to troubleshoot the issues with technology. The faculty also faced similar issues while teaching. In India, many institutions lack the

infrastructure and equipment to conduct online education for students.<sup>[48]</sup> Although there is no specific research that indicates the status of teaching faculty of respiratory therapy yet, many reports across India suggest that the faculty of medical and allied health professions lack the appropriate training required to handle the technological systems to teach.<sup>[10,49,50]</sup> Hence, it is imperative to train the existing faculty about conducting online training for students.

### **Lack of evidence-based guidelines at the beginning of the pandemic**

The virus's novelty and the infection were the biggest threat to respiratory care. The lack of medicine or vaccine made it harder for healthcare professionals to prevent the disease. There were no set protocols and management strategies to manage COVID-19, leaving them to make decisions.<sup>[21]</sup> The treatment outcomes were based on trial-and-error methods. RTs had to modify lifesaving but aerosol-generating procedures such as intubation and aerosol therapy to limit the spread of infection.<sup>[51]</sup> The guidelines that were finally made evolved rapidly with new experiences and researches, which further made it difficult to manage the patients.<sup>[52]</sup>

### **Scarcity of essential devices and medical gas**

RTs are experts in operating essential devices such as the mechanical ventilator and medical gas operation and related equipment such as oxygen concentrators and cylinders. During the second pandemic wave, RTs were left with limited resources to support the patient's ventilation due to the nationwide shortage of these essential devices.

### **Less priority to patients with non-COVID-19 diseases**

All patients with non-COVID diseases, chronic conditions, and nonemergent surgical procedures were deferred during the pandemic's peak.<sup>[7]</sup> RTs were asked to work in the COVID-19 wards and ICUs to cater to the patients. Since the number of RTs in India is not enough for all our patient population, and since hospitals in many states of the country do not have RTs, patients who did not have COVID-19 did not receive a skilled RT's attention.<sup>[7]</sup>

### **IT IS TIME TO TAKE RESPIRATORY THERAPISTS TO A DIFFERENT LEVEL**

This pandemic exposed a shortage of skilled allied health professionals, especially RTs in India.<sup>[6,7]</sup> Despite that, RTs stretched themselves thin and offered their skills throughout the pandemic. This is a definitive indication that there is a need to train and produce more RTs to cater to this shortage. During the second wave, RTs could apply the experience and knowledge gained from the first wave, and learn to handle new issues such as shortage of oxygen and ventilators. This experience taught RTs to adapt to any situation and deliver quality services. The scope of practice increased and will continue to grow.

These tough times gave a chance for RTs to prove their worth. It has opened doors that will change education and practice

patterns for the progress of the profession. The profession needs to mature and grow more than ever. There is a scope for RTs to generate more evidence and create pioneering management strategies. RTs also can develop innovative ideas and devices using artificial intelligence and machine learning.<sup>[21]</sup> RTs should expand their knowledge base and acquire new skills that help patient management. And use these skills beyond the intensive care unit, to cater to the ever-growing population of chronic respiratory disease patients.

### **CONCLUSION**

The COVID-19 pandemic has, for the first time, highlighted the importance of lungs and showcased to the world the tremendous value and contribution of pulmonologists; however, given the limited number of pulmonologists and physicians, the role of RTs is crucial. COVID-19 has had devastating effects on Indians since the beginning of 2020. RTs have strived even harder to provide their service for the same. The pandemic has brought great opportunities for RT education and practice. There is still more room to grow for the profession and a long way to go before we have enough therapists catering to the respiratory disease population.

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