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## Post-COVID Reflections, the Dental Laboratory Perspective

Anamelechi C A\*

\*Department of Child Dental Health, Faculty of Dental Sciences, College of Medicine,  
University of Lagos.

**Correspondence:** Anamelechi C A

**Email:** chanamelechi68@gmail.com

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### **Abstract**

*There has been a growing interest in the topic of COVID-19 and its impact on dental laboratories. It has gained attention from researchers, policymakers, and the public due to its significance for the overall safety of dental practitioners. Understanding the various aspects of this topic is crucial to addressing the challenges and opportunities it presents. This paper will delve into the different dimensions of the pandemic's impact and explore its implications for the future of dental technology and dentistry at large. The purpose of the paper is to provide a comprehensive analysis of COVID-19 and its impact on the practice of dental technology. By examining the different perspectives and factors involved, we aim to offer insights and recommendations for addressing the issues and leveraging the opportunities associated with them. Lessons learned from the pandemic can be applied to future crises. The importance of preparedness, adaptability in navigating uncertain times and strategies for adapting to future crises will be highlighted.*

**Keywords:** laboratories. Healthcare. Supply. Dental Practices. COVID-19. Dental Laboratories. Dental Professionals. PPE. Dental Industry.

### **Introduction**

COVID-19 is a highly infectious respiratory illness caused by the SARS COV 2 virus. It was first identified in Wuhan, China, in December 2019 and rapidly spread globally, resulting in a pandemic. The virus primarily spreads through respiratory droplets when an infected person talks, coughs, or sneezes. Symptoms can range from mild to severe and include fever, cough,

and difficulty breathing. While vaccines have been developed and are being distributed worldwide, the pandemic continues to impact communities.

COVID-19 and its impact on the dental industry have been significant. Dental professionals are at high risk of contracting and spreading the virus due to the proximity of their work to patients' mouths. As a result, many dental practices have

implemented new safety protocols, such as increased use of personal protective equipment and enhanced disinfection procedures, to minimize the risk of transmission. Despite these measures, the pandemic has caused a decrease in routine dental visits and an increase in emergency procedures, highlighting the need for continued vigilance and adaptation within the industry.

Dental laboratories play a crucial role in providing high-quality dental products and services, so their significance in the industry cannot be overlooked. Their expertise is essential to the development of new technologies and techniques for dental treatment, and they work closely with dentists to ensure that patients receive the best possible care.

**The objectives of this paper were to:**

- Examine the effect of COVID-19 on the dental industry and how it has altered the operation of dental laboratories,
- Describe the strategies implemented by dental laboratories to adapt to new safety measures and protocols during the pandemic,
- Demonstrate how the pandemic has affected the supply chain management of dental laboratory materials,
- Examine the use of technology to facilitate communication between dentists, patients, and dental laboratories and

- Predict how post-COVID dental industry practices will continue to develop in the future.

**The immediate impact of COVID-19 on the dental industry**

The temporary closure of dental offices and reduced patient visits have had a significant impact on dental laboratories, causing delays in production and affecting their revenue. Despite these challenges, dental laboratories have adapted by implementing safety protocols and utilizing technology to continue providing essential services to dentists and patients. It is important to support dental laboratories during these difficult times to ensure the continued success of the dental industry.

A decrease in demand for elective procedures and delays in shipping and receiving materials presented challenges for dental laboratories during the pandemic. Despite these obstacles, many dental laboratories found innovative solutions to maintain production and meet the needs of their clients. By working together and supporting one another, dental service providers overcame these challenges and emerged stronger than ever before.

Implementation of new safety protocols and equipment were crucial in ensuring the safety of both staff and patients during the pandemic. Additionally, some dental laboratories have shifted their focus to producing personal protective equipment (PPE) for healthcare

workers, contributing to the fight against COVID-19.

### **Changes in the way dental laboratories operated during the pandemic**

- There was an increased demand for digital dentistry and CAD/CAM technology which led to changes in the way dental laboratories operated during the pandemic. With the use of digital technology, dental laboratories created restorations with greater accuracy and efficiency. This has also allowed for remote communication between dentists and dental laboratories, reducing the need for in-person visits.
- Adapting to new safety protocols and sanitization measures, dental laboratories also implemented contactless delivery and pickup options for their clients. Additionally, the integration of artificial intelligence and machine learning in dental laboratory processes has further improved the quality and speed of restorations.
- Struggles with supply chain disruptions and delays due to the pandemic also prompted dental laboratories to explore alternative sourcing options and adopt more efficient inventory management systems. Despite these challenges, the dental laboratory industry remains committed to providing high-quality and safe services to its clients during these unprecedented times.

### **Challenges faced by dental laboratories during the pandemic**

- Financial strains due to reduced demand and increased costs of personal protective equipment (PPE) was a major challenge for dental laboratories during the pandemic. Some laboratories also faced difficulties in obtaining necessary materials and supplies due to disruptions in global supply chains. Despite these obstacles, many dental laboratories adapted by implementing cost-saving measures and exploring new business opportunities.
- Difficulty in maintaining a skilled workforce was a challenge for some dental laboratories, as some employees may have been unable to work due to illness or quarantine measures. However, many laboratories found ways to train and cross-train their staff to continue to provide high-quality services to their clients.
- Uncertainty about the future of the industry also led some laboratories to explore new business models and diversify their offerings to adapt to changing demands and challenges. Despite these difficulties, the laboratory industry remains an essential part of healthcare and scientific research, and its resilience in the face of adversity is a testament to its importance.

## **Overview of Strategies implemented by Dental Laboratories during the Pandemic**

A dental laboratory is a specialized facility where dental prostheses and appliances are fabricated to meet the specific needs of patients. These prostheses may include dentures, crowns, bridges, and orthodontic appliances such as braces and retainers. The laboratory is staffed by highly trained technologists who use advanced equipment and materials to create custom-made dental products that are both functional and aesthetically pleasing. In addition to creating prostheses, dental laboratories may also provide repair and maintenance services for existing ones.

- The importance of safety measures and protocols during pandemics cannot be overstated, as dental laboratories must prioritize the health and safety of their staff and clients. Proper sanitation and disinfection protocols, as well as the use of personal protective equipment, are crucial to preventing the spread of infectious diseases in the workplace.
- Overview of strategies implemented by dental laboratories to ensure a safe working environment during the COVID-19 pandemic: In addition, many dental laboratories have also implemented measures such as staggered work schedules and remote work options to reduce the number of people in the laboratory at any given time. These strategies not only protect staff and clients from potential exposure to

COVID-19 but also help ensure that dental laboratories can continue to provide essential services during these challenging times.

## **Implementation of Safety Measures**

- Personal Protective Equipment (PPE) for staff, regular disinfection of equipment and surfaces, and mandatory health screenings for all individuals entering the laboratory are some of the safety measures that were implemented. Additionally, social distancing protocols have been put in place to ensure that individuals maintain a safe distance from each other while working in the laboratory. These measures helped to prevent the spread of infectious diseases and ensure the continued operation of dental laboratories during these challenging times.
- Social distancing measures were also implemented in the dental laboratory to minimize close contact between workers. Dental laboratory managers provided clear guidelines and training on these safety measures to ensure that all workers followed proper protocols.

## **Deployment of technology during the pandemic**

- Digital communication for orders and consultations were utilized to reduce physical interaction between dental laboratory workers and clients. This was done through online platforms and

software that allow for virtual consultations and order placements. Additionally, the use of automation technology in the dental laboratory can further minimize contact between workers by reducing the need for manual handling of materials and tools. The application of these strategies were limited by unavailability of technology in dental laboratories across Nigeria.

- Virtual meetings with clients helped reduce travel time and expenses while providing a more convenient and efficient way to communicate. Furthermore, the use of digital technology such as 3D printing streamlined the production process and improve accuracy, ultimately leading to better patient outcomes. The application of this strategy was very limited in Nigeria.
- Utilization of 3D printing technology in healthcare has also shown promise in creating personalized medical devices and implants, as well as aiding in surgical planning and education. The potential benefits of incorporating digital technology into healthcare are vast and continue to evolve as new advancements are made.

### **Modifications in Workflow**

- Staggered work shifts to reduce contact and maintain social distancing, teledentistry to reduce in-person visits,

and remote monitoring of patients are some examples of how digital technology can modify healthcare workflows. These modifications can increase efficiency, reduce costs, and improve patient outcomes and were successfully deployed in Nigerian dental laboratories during the pandemic.

- Limits on the number of staff in the workspace, the use of personal protective equipment (PPE), and frequent sanitization protocols were also important measures implemented to ensure the safety of healthcare workers and patients.
- Use of contactless delivery options is one such technology which helped to minimize physical contact and reduced the risk of transmission of infection. Additionally, teledentistry services were utilized in varying degrees to provide remote consultations and follow-ups, reducing the need for in-person visits and further minimizing exposure.

### **A brief description of the pandemic's impact on supply chain management**

The COVID-19 pandemic has had a significant impact on supply chain management worldwide. The outbreak has disrupted global trade, causing delays and shortages of essential goods such as medical supplies and personal protective equipment. As a result, businesses have had to quickly adapt their supply chain strategies to mitigate the effects of the pandemic and ensure

continuity of operations. The pandemic has highlighted the importance of building resilient and flexible supply chains that can withstand unexpected disruptions. Companies are now exploring new ways to manage their supply chains.

The importance of dental laboratory materials in the industry has also become more evident during the pandemic, as dental practices have had to adapt to new safety protocols and increased demand for certain products. Ensuring a steady supply of high-quality dental laboratory materials is crucial for maintaining the health and safety of patients as well as the success of dental practices.

With the COVID-19 pandemic, dental practices faced unprecedented challenges in ensuring the safety of their patients and staff. As such, the quality and availability of dental laboratory materials have become even more critical in ensuring that dental procedures are performed safely and effectively.

### **Overview of supply chain management in dental laboratories**

Effective supply chain management can help ensure that dental laboratories have a steady supply of high-quality materials, which is crucial for maintaining patient safety and satisfaction. The importance of efficient supply chain management in dental laboratory operations cannot be overstated. It not only ensures timely delivery of materials but also helps in reducing costs and minimizing waste. With an efficient

supply chain, dental laboratories can focus on providing the best possible service to their patients while also improving their bottom line.

Outlining the various stages of the supply chain process, from sourcing raw materials to delivering finished products, is crucial for optimizing efficiency and identifying areas for improvement. Additionally, implementing technology such as automated inventory management systems can further streamline the supply chain and improve overall performance.

### **Effects of the Pandemic on dental laboratory supply chain management**

Disruption in the transportation and logistics processes due to the pandemic led to delays in the delivery of raw materials and finished products, resulting in production slowdowns and increased costs. As a result, dental laboratories had to adapt by sourcing materials locally or finding alternative suppliers while also implementing safety measures to protect their employees and customers.

Limited supplies of raw materials due to disrupted global supply chains have caused significant challenges for dental laboratories in recent times. In addition, the increased demand for personal protective equipment (PPE) has also put a strain on the availability of essential supplies needed for dental procedures. An increase in material costs due to supply chain disruptions has further added to the financial burden on dental laboratories. As a result, many dental laboratories have had to adapt their

operations and find alternative sources of supplies to continue providing essential services to patients.

### **Strategies to mitigate the effects of the pandemic on dental laboratory supply chain management**

Diversifying suppliers and material sources are one effective strategy that dental laboratories can employ to mitigate the effects of the pandemic on their supply chain management. Additionally, investing in technology and automation can also help streamline operations and reduce the need for manual labour, which may be impacted by workforce shortages or social distancing measures. Planning for potential supply chain disruptions is also crucial, such as by diversifying suppliers and creating contingency plans. Furthermore, collaboration with other companies and industry partners can help share resources and knowledge to overcome challenges together.

Investing in technology to improve supply chain visibility and efficiency can also mitigate risks and improve overall performance. By utilizing tools such as data analytics and automation, companies can gain real-time insights into their supply chain operations and make informed decisions to optimize their processes. These measures can help ensure that businesses are prepared to navigate unexpected disruptions and maintain a resilient supply chain.

It is important to implement strategies to mitigate the impact of future disruptions on

supply chain management. By placing emphasis on the need for businesses to continuously evaluate and improve their processes so as to remain agile and adaptable in the face of uncertainty, and by taking proactive steps to optimize their supply chain management. Dental laboratories can not only mitigate the impact of future disruptions but also position themselves for long-term success in an increasingly competitive market.

In addition, they will continue to meet customer demands by being vigilant and proactive in identifying potential risks and implementing measures to address them.

### **Predictions of the future and planning for potential dental care disruptions**

The COVID-19 pandemic has brought about significant changes in the way dental practices operate. To minimize the risk of transmission, dental laboratories have implemented various safety measures, such as enhanced cleaning protocols, social distancing, and the use of personal protective equipment (PPE). Additionally, many practices have also adopted teledentistry as a means of providing virtual consultations and follow-up appointments. These changes have not only helped to protect patients and staff but have also paved the way for increased efficiency.

The importance of discussing future predictions and planning for potential disruptions in dental care delivery cannot be overstated. As the world continues to grapple with the COVID-19

pandemic, dental practices need to remain vigilant and adaptable in their approach to patient care. By staying up-to-date on the latest guidelines and best practices, dental professionals can ensure that they are providing safe and effective care to their patients, even in the face of unforeseen challenges.

It is crucial to highlight the importance of continuous learning and professional development in the field of dentistry. By embracing a growth mindset and seeking out opportunities for education and training, dental professionals can improve their skills and knowledge, ultimately leading to better outcomes for their patients. Additionally, staying current with emerging technologies and trends can help dental practices stay competitive in an ever-evolving industry.

### **Evolving patient communication**

Increased reliance on teledentistry and virtual consultations has become more prevalent in recent years, especially during the COVID-19 pandemic. As such, dental professionals must adapt to new communication methods and technologies to effectively connect with their patients and provide quality care. By embracing these changes, dental practices can improve patient satisfaction and loyalty while also increasing efficiency and productivity.

Integration of virtual consultations and teledentistry services can also reduce the need for in-person visits and help minimize the risk of virus transmission. Additionally, implementing

strict safety protocols and utilizing personal protective equipment (PPE) can further ensure the safety of both patients and dental professionals during appointments.

Emphasis on patient education and self-care practices can also play a crucial role in preventing the spread of infections. Dental professionals need to educate their patients on proper oral hygiene techniques and provide them with resources to maintain good oral health at home. By working together, we can create a safer and healthier environment for everyone.

### **Shifts in practice management**

Embracing flexible scheduling and appointment booking, as well as utilizing teledentistry options, can help reduce the number of patients in the office at one time and minimize contact between individuals. Implementing virtual consultations and follow-up appointments can also increase efficiency and convenience for both patients and dental professionals. These changes can lead to a more streamlined and adaptable practice management approach in the face of uncertain times.

Integration of contactless payment systems and online appointment scheduling can further enhance the safety and convenience of dental visits. Additionally, providing patients with educational resources on proper oral hygiene practices can help reduce the need for in-person appointments and promote overall dental health.

Increased emphasis on team collaboration and remote work capabilities can also improve the



efficiency and effectiveness of dental practices, allowing for better communication and coordination between staff members and the ability to work from anywhere. Furthermore, implementing teledentistry services can expand access to care for patients in remote or underserved areas, improving overall oral health outcomes.

In the future, dental technology will likely continue to advance, leading to even more efficient and effective dental practices. This may include the use of artificial intelligence and virtual reality in treatment planning and patient education, as well as the development of new materials for restorative procedures. Overall, these advancements have the potential to greatly improve the quality of care for patients and make dental visits more comfortable and convenient.

### Conclusion

Post-COVID dental practices will need to adapt to changing circumstances by embracing technology and implementing new protocols for infection control. The use of virtual consultations, online scheduling, and teledentistry services will become increasingly important for providing safe and efficient care. By staying up-to-date with these changes, dental practices can continue to provide high-quality care while keeping both staff and patients safe.

Encouragement for dental professionals to stay informed and prepared for the future of dental practices post-COVID is likely to see a continued emphasis on telehealth and virtual

consultations, as well as increased use of personal protective equipment (PPE) and infection control measures. Dental professionals need to stay up-to-date with the latest developments in the field and be prepared to adapt to changing circumstances to provide the best possible care for their patients.

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