

The Effects of COVID-19 on the Compliance of Dental Operators with Infection Control in Saudi Arabia: A Review

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Abstract

Background: The COVID-19 pandemic shocked the world by its fast and massive spread, morbidity and mortality. This pandemic has had a significant impact on infection control practices among dental operators as well as other specialties; dental operators are at the highest level of being more prone to infections, due to their direct exposure to the patients. Furthermore, routine dental treatment includes the use of some instruments that stimulate the infection chain, such as air-turbine handpieces and ultra-sonic scalers.

Aim: This paper aims to review the compliance and knowledge of dental operators in Saudi Arabia with infection control measures before, during, and after the COVID-19 pandemic. And provide recommendations to reduce future pandemic risks.

Method: A comprehensive review of scientific literature published between December 2019 and December 2021 was conducted, focusing on reports related to COVID-19 in dental clinic settings and infection control in dentistry in Saudi Arabia.

Result: The compliance with infection control measures varied among dental operators. In general, younger dentists demonstrate lower compliance compared to more experienced dentists. For example, 52.2% of faculty members washed their hands before wearing gloves, in contrast, only 31.3% of the students in the study practiced hand hygiene, it was found that 74% of dentists preferred an N-95 mask over a standard face mask in dental practice during Covid-19 pandemic.

Conclusion: Note that observed changes in compliance and knowledge during the COVID-19 pandemic may also be influenced by new rules and educational programs about infection control measures. It is essential to maintain a strong focus on infection control in dental practices to ensure the safety of patients, healthcare workers, and the wider community. Future research and awareness campaigns are needed to strengthen infection control compliance in Saudi Arabia.

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Introduction

Coronavirus disease is an infectious disease caused by the severe acute respiratory syndrome corona virus -2, World Health Organization (WHO) [1]. This is also known as COVID-19, which was the pandemic that shocked the world by its fast and massive spread, morbidity and mortality. It gave rise to the importance of tightening our thoughts on the spreading of any disease. Globally, there have been 651,918,402 confirmed cases of COVID-19, including 6,656,601 deaths, reported to (WHO). In Europe, where the highest cases were, about 268,999,461 confirmed and announced cases. Comparably, in South-East Asia there were 60,724,442 confirmed cases. And in our concerned area, Saudi Arabia, there have been 826,667 confirmed cases of COVID-19 with 9,502 deaths, reported to WHO. Also, a total of 68,148,406 vaccine doses have been administered, on 3 December 2022, (WHO) [2]. For our protection, Infection control is a practical, evidence-based approach preventing patient and health workers from being harmed by avoidable infections. (WHO) [3]. In general, the spread of an infection within a community is described as a chain, in which it can be subcategorized as infectious agent, reservoir, portal of exit, mode of transmission, portal of entry, and susceptible host. These factors can be addressed in healthcare settings to raise the concept of infection control. Controlling of the infections can also be broken down into two sections. First, standard precautions for all patient care and transmission-based precautions. This is based on a risk assessment and makes use of common-sense practice and personal protective equipment. The second is used additionally to the earlier one with those who have known or suspected infections, (Centers for Disease Control and Prevention (CDC) [4]. In dental healthcare, there is a high risk of transmissibility. According to Aurangjeb AM et al [5] dentists and their staff are at the highest level of being more prone to infections, due to their direct exposure to the patients. Furthermore, routine dental treatment includes the use of some instruments that stimulate the infection chain, such as air-turbine handpieces and ultrasonic scalers, reported by Mahasneh et al [6]. Also, some dental operators keep the focus on the oral diseases rather than concerning the medical history of the patients, in which some infectious symptoms might be asymptomatic [7]. Ethically, it is important to do no harm to other non-infected patients. Over the spread, dental practice is rich in infectious diseases for example, Hepatitis B, C, and D viruses, also Herpes Simplex Virus (HSV), Vesicular Stomatitis Virus (VSV), and Human Immunodeficiency Virus (HIV). Laheij et al [8], reported that HBV poses the greatest risk for both dental teams and patients. According to the CDC's latest guideline, every dental facility should have an infection prevention coordinator. The coordinator handles developing written infection prevention policies based on the updated resource's evidence-based recommendations from the official organization. The coordinator should support others in the clinic in keeping the materials and equipments needed for prevention up to date [9,10]. In Saudi Arabia there is high expansion of healthcare facility, but there are still challenges with infection control. Special consideration is given to developing future infection control strategies. Saudi Arabia is one of the best countries in leading medical fields, also aspires to reach international collaboration in infection control [11,12]. Lack of infection control articles in Saudi Arabia remains the most issue to be diminished to have a better health care environment. This article's aim was to increase awareness of infection control of dental operators during and after the pandemic and to assess infection control compliance improvement.

Method

A search was conducted of the English-language scientific literature published between 31 December 2019 and 31 December 2022. Through electronic search engines like Google Scholar, PubMed, Scopus, and Saudi Digital Library. The criteria for retention of reports for further processing were the following: reports written in English, reports concerning on COVID-19 in Saudi Arabia, reports on dental infection control in Saudi Arabia, COVID-19 in dental clinic settings, compliance of infection control in dentistry. During the selection process, reports for which neither the abstract nor the full text could be obtained were eliminated, duplicated reports were excluded.

Results

The research paper's conclusions, which were arrived at after a thorough analysis of numerous studies, offer insights into the compliance of dental practitioners with infection management in Saudi Arabia during the COVID-19 pandemic. The findings show that there are differences in compliance levels depending on experience, education, and attitudes toward personal protective equipment (PPE).

Compliance among dental faculties and students

A study conducted by Alharbi et al [13] at King Saud University, Riyadh, Saudi Arabia. It was found that 52.2% of the dental faculties washed their hands before wearing gloves, while a higher percentage (96.7%) wore gloves during treatment. Additionally, 98.9% of the faculties changed their gloves between patients.

The same study reported that 92.2% of the dental faculties wore face masks and 64.4% of them changed masks between patients. Protective face shields were worn by 54.4% of the faculties, 52.2% of them sterilized the face shields between patients and 70% wore gowns.

In contrast, only 31.3% of the students in the study practiced hand hygiene, while 95.2% wore gloves and 95.6% changed them, and 90.7% wore face masks and 73.1% changed them, 46.3% wore face shields and 51.5% changed them. And 92.1% wore gowns while only 67.8% changed them between patients.

Another study by Al-Essa et al. [14] at King Saud University, Riyadh, Saudi Arabia. Involving 303 students found that 99.3% consistently wore gloves, while 98.7% wore face masks and 95% wore gowns and only 67.8% changed it between patients. Furthermore, 69.6% of the students always wore face shields, and 65% wore head covers. However, only 67% of the students cleansed their hands at each glove change. Interestingly, when leaving their clinics, most participants (91.1%) removed their gloves, while only 39.3% removed their masks.

Attitude toward personal protective equipment (PPE)

A survey was conducted by Mustafa RM et al [15] among 265 dentists and reported that 85.9% of the participants believed that dental goggles, face masks, and gloves were beneficial in protecting them from potential COVID-19 patients. It was shown that 93.3% thought of replacing both masks and gloves between patients.

It was shown in a study by Tarakji et al [16] at Prince Sattam bin Abdulaziz University, Al-Kharj, Saudi Arabia, it was found that 74% of dentists preferred an N-95 mask over a standard face mask in dental practice. However, a huge proportion of

dentists (31.1%) expressed a negative attitude towards using a rubber dam as a barrier to reduce aerosols and the risk of COVID-19 infection.

In another study by Basheer et al [17] at Jazan University, Jazan, Saudi Arabia reported that, out of 322 participants, approximately 52.9% of the participants followed end-of-treatment environmental cleaning and disinfection protocols, while about 42.7% cleaned and disinfected reusable PPE. Additionally, a study by Shubayr et al [18] at Jazan University, Jazan, Saudi Arabia reported that dental practitioners working in academic sectors, such as students or faculty, were more likely to practice COVID-19 infection and prevention control measures compared to those working in private dentistry clinics.

Compliance before and during COVID-19

A study conducted by Cheng et al [19] compared compliance rates before and after the COVID-19 pandemic and found increased adherence to infection control measures. The study reported higher levels of compliance with mask usage, glove changing, and overall PPE compliance during the pandemic. Dentists working in academic sectors, including students and faculty members, were more likely to practice infection and prevention control (IPC) measures than those in non-academic clinics.

The results show a different level of compliance among dental operators in Saudi Arabia about infection control during the COVID-19 pandemic. While the use of gloves and face masks was high, there were areas where compliance was lacking, such as hand hygiene and the use of face shields.

Discussion

For the safety of their patients, their staff, and dental operators are required to implement policies that prevent or limit the transmission of infections in dental offices. The findings are quite like each other before COVID-19, and they have significantly changed after COVID-19. As it was reported Alharbi et al [13] reported that 52.2% of 191 faculties wash their hands before wearing gloves. It is considered a low percentage from a hygiene perspective and the teachers should be a good example for their students. In terms of hand hygiene, healthcare workers are recommended to wash their hands. Meneguetti et al [20] reported that one of the reasons is that hand hygiene compliance may be hampered by using powdered gloves, that causes longer time needed to wash hands. Alharbi et al [13] reported that 31.3% of the students wash their hands prior to wear gloves, also Abu-Hammad et al [21] reported that mean percentages of observed handwashing and glove removal compliance did not differ significantly by sex, level of education, or job type. Interventions should also include strategies that foster awareness of human interactions and interface with other components of the healthcare system to maximize health care providers' safety [22]. Another finding by Raymond J Roberge et al [23] reported that about 46.3% wear face shield, the report concluded that up to 95% is the protection that the face shield gives against viruses. In a human study using sprayed water during simulated surgery, a 40.5% incidence of contamination of surgical mask with eye goggles was seen, and 6.5% contamination of the rest face. This can show the importance of using a face shield. Less using of face shield with the standard face mask might be because the lack of awareness and lack of time among student and lack of interest, while interest is not a logical reason, but sometimes laziness is one of the reasons, which may be solved by encour-

agement and rewarding, this finding is very important as the Inner canthus is one of the most infected sites of the face [24]. Those who worked in academic sectors as students or faculty were more likely to practice COVID-19 infection and prevention control than those who worked in non-academic clinics. This may be because of the strictness of the faculty members and because of the activities of the infection control department in the educational centers, also that the students have higher desire to practice infection control. Furthermore, out of 276 participants before COVID-19 and 251 after, showing increased levels of compliance with mask, gloves, and PPE were reported by Cheng et al [19]. It is mainly due to the spread of the disease, and there was high awareness of the pandemic, and it is expected that strict and compliance to the infection control, during the COVID-19 pandemic, raises the number of dentists using a hair cap and a protective face shield dramatically as compared to before. To strengthen infection control in the future, the Saudi governmental organizations have implemented policies and continuous educational programs. For example, developing standardized specifications for supplies and preparing equipments for infection control recommended for treatments. Also, they supply source of informations for health workers to raise the rates of hand hygiene. And supply the necessary disinfection materials [25]. These are new rules, and they will have an impact on the outcomes in the future, thus they may not be related to the modifications made by COVID-19.

Recommendations

1. Motivate and support young health care professionals to publish studies in this topic.
2. Increasing the campaign for infection control awareness.
3. Periodically perform Lab-culturing for the dental offices to make sure of the level of sterilization
4. Adhering to the local and international guidelines for disinfection and sterilization in healthcare facilities and dental clinics.

Conclusion

The results of this study emphasize how crucial it is to instruct all health care providers and especially dental operators on infection control procedures and current guidelines. In addition to effective dental care, it's crucial for patients and healthcare professionals to support a healthy dental environment. Awareness of the application of infection control procedures was raised because of the fear of COVID-19 infection transmitting to families and other patients. After the pandemic has subsided, we should remind ourselves that we do not fail to apply the infection control procedures, and do not forget the rest of the infections scattered in dentistry such as Hepatitis B, C, and D viruses, HSV, VSV, and HIV. Due to the lack of studies related to infection control in Saudi Arabia, we encourage our colleagues to work in this regard and increase the awareness together by publishing more research in infection control compliance, attitude, and awareness.

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