*Original Research Article*

# TO EVALUATE FEAR AND ASSESS PRACTICE MODIFICATION AMONG DENTIST AGAINST COVID-19 IN INDIA – A QUESTIONNAIRE BASED SURVEY


## Abstract

INTRODUCTION: This highly infective new virus, named Severe Acute Respiratory Syndrome-Coronavirus-2 (Sars-CoV-2), is a corona virus responsible of an acute respiratory syndrome, often asymptomatic but potentially lethal, named Corona Virus Disease 19 (COVID-19). Airborne and direct contact contamination is a major infection pathway of Sars-CoV-2. SARS-CoV-2 transmission during dental procedures can therefore happen through the inhalation of aerosol/droplets from infected individuals or direct contact with mucous membranes, oral fluids, and contaminated instruments and surfaces .Therefore, dentists have a high risk of getting infected from patients and potentially spreading it to their peers, families, and other patients.

AIM: To evaluate fear and assess practice modification among dentist against COVID-19 in India

MATERIALS AND METHOD: In this cross-sectional study a total of 260 general dental practitioners, postgraduates and graduates across Central India, who were registered under the Dental Council of India, were included in the survey. A questionnaire consisting of 22 Questions with regard to COVID -19 fear and practice modification was designed and the questionnaire was circulated through a web designed program. The responses were collected, and data were analyzed descriptively using SPSS Statistics for Windows version 27.0.

RESULT: There is a description of the fear and anxiety levels of dental care professionals towards COVID-19; 83.85% of participants were afraid of getting infected with COVID-19 from either a patient or a co-worker. While treating a coughing or a patient suspected to be infected with COVID-19, 90% were anxious. In terms of using personal protection, 63.85% believed that a surgical mask is not enough to prevent cross-infection of COVID-19. In comparison, 93.08% favored the use of N-95 masks for routine dental procedures during the current outbreak. Although the majority 91.15% recommended routine universal precautions of infection control.

CONCLUSION: Overall, this study sheds light on the association of COVID-19 factors and fear and anxiety elevated among dentists during working in this pandemic. Covid-19 spread all over world and is worsening day by day. On current scenario several dental practices have either modified their services according to recommended guidelines to emergency treatment only, or closed down practices for an uncertain period.



Keywords: Sars-CoV-2, WHO, Anxiety, DCI

## INTRODUCTION

An outbreak of novel corona virus disease in China has influenced every aspect of life. Within short span of time, COVID-19 has spread globally. The World Health Organization (WHO) declared it as a controllable pandemic disease. This new highly contagious virus, called Severe Acute Respiratory Syndrome-Coronavirus-2 (Sars-CoV-2), is a corona virus that causes severe, often undetectable but deadly [1], called Corona Virus Disease 19 (COVID-19).

Sars-CoV-2 has a two-week incubation period and clinical manifestations of COVID-19 mainly include cough, fever and dyspnea [2], but also anosmia, ageusia and, in a few cases, diarrhea has been reported [3]. Airborne and direct contact is a major cause of Sars-CoV-2 infection. Air pollution is the result of droplets released by inhalation, coughing or sneezing; the most direct infection is due to contact with the affected area and the eye, nose or mouth mucosa [4]. The outbreak and spread of Sars-CoV-2 and COVID-19 has created an emergency in the world health system. To date, millions of cases have been reported, and many patients have died worldwide (WHO Source of Report 70). India has registered the highest number of COVID-19 cases.

Due to droplet production and exposure to saliva and blood, dentists are at high risk of infection during their routine procedures[5,6,7]. SARS-CoV-2 transmission during dental procedures is therefore possible by inhaling aerosol / droplets from infected people or direct contact with mucous membranes, oral fluids, metals and contaminants [8].

Therefore, dentists are at high risk of transmitting the virus to patients and who may spread it to peers, families and other patients. Under these circumstances, it may be natural for dentists to be afraid of being infected by their patients. Fear and anxiety are powerful emotions that can be associated with shocking reports of the COVID-19 epidemic by social media, electronic, and print media. Minor anxiety is natural and promotes protective and protective behavior [9]. In this day and age, people with chronic anxiety may be frightened and may make mistakes that lead to irrational and behavioral decisions. To be on the list of high-risk specialists, dentists are most likely to be very concerned about the current state of the epidemic [10].

Considering the current rapid spread of infection, the Dental Council Of India (DCI) highlighted the important steps that dentists should take in addition to standard safety measures such as taking recent patient visits; testing for signs and symptoms of RTI; recording body temperature of patients; rinse the mouth with 1% hydrogen peroxide before the start of any procedure; use of a rubber dam and absorb large volumes during the processes; and regular cleaning and disinfection of public areas including door handles, chairs and bathrooms. Although DCI has published guidelines for prevention, many dentists are still hesitant and afraid to treat patients in such a situation. In fact, many dentists may not be aware of the latest guidelines. Therefore, we have conducted a series of questionnaires to assess the response of dentists throughout India. The current study aims to assess the anxiety and fear of infection among dentists who work during an outbreak. In addition, the dentist's knowledge of various anti-corona virus (COVID-19) variables has been evaluated.

## MATERIALS AND METHODS

This cross-sectional study was conducted in India, April 2021 at Nagpur. The research protocol was approved by the Institutional Ethics Committee with ethical clearance number – SDKS/PG/STRG/PROSTHO1/DATED 21-12-2020. The questions used in the survey were taken from the reference article by Muhammad Adeel Ahmed et al which was validated through intra-class correlation with a strong relation of 0.74.[11]

**Inclusion criteria** – A total of 260 dentist across Central India; registered under the Dental Council of India, were included in the survey. Graduates, General dental practitioners and Postgraduates were included in the study.

**Exclusion criteria** - Any paramedical staff, physician, hygienist, people not willing for study and dental students were not included in this survey.

**Sample size calculation-** The sample size was calculated using sample size formula for qualitative data for similar type of study conducted in India.

$$n = \frac{2\,\mu_2^2\;\; p(1-p)}{E^2}$$

Where,
$2\mu_2$ is the level of significance at 5 %
i.e. 95 % confidence interval = 1.96
p = 61 % = 0.61
E = Error of margin = 5 % = 0.05

$$n = \frac{1.96^2\;\times 0.61(1-0.61)}{0.05^2}$$

=253.86
n = 260 patients needed in the study

Study reference: Muhammad Adeel Ahmed et al
Power of study: 80 %
Study design: cross sectional
Statistical Method: chi-square test

A specially created web designed survey in Google forms was circulated among the General Dental Practitioners, Graduates, Postgraduates and the responses were recorded. This questionnaire survey consisted of 28 questions. The questionnaire was prepared to evaluate fear and assess practice modification among dentist against COVID-19 in India considering study conducted by Muhammad Adeel Ahmed et al in 2020.

- Six questions were related to the demographic data (Gender, age, designation, qualification, workplace and work setting).

- Eight questions related to fear and anxiety assessment of dental care professionals.
- Fourteen questions related to Knowledge and practice of dentists about COVID 19.

Subsequently, the questionnaires about fear and practice modification among practicing dentist against COVID-19 were randomly administered to be answered on an anonymous basis and the responses were collected. The results of the survey were tabulated in Google Sheets.

**RESULTS**

Cross-sectional study was conducted using an online survey questionnaire from 10th to 17th March 2021. For this purpose, a well-constructed questionnaire was designed .The online survey link was circulated through social media and an e-mail to dental professionals and received total of 260 responses through an online survey submission. The initial part of the questionnaire acquires demographic data which consist of gender, age, designation, qualification, workplace, work setting. Questionnaire consists of 22 questions comprising of two sections .Eight questions were based on the level of fear and anxiety. Fourteen questions related to practice modification of habits due to COVID 19. Data was collected and analyzed descriptively using SPSS Statistics for Windows version 27.0 V, Graph pad Prism 7. V.

Table 1. Demographic data of practicing dentist ,n = 260

| Demographic | Parameter | Number (%) |
|---|---|---|
| Gender | Male<br>Female | 106 (40.77)<br>154(59.23) |
| Age | 20-30<br>31-40<br>41-50<br>51-60 | 179(68.85)<br>42(16.15)<br>27(10.38)<br>12(4.62) |
| Designation | Consultant<br>General Dental Practitioner<br>Specialist | 14(5.38)<br>120(46.15)<br>126(48.46) |
| Qualification | Graduates<br>Postgraduates | 120(46.15)<br>140(53.85) |
| Work Place | Hospital<br>Clinic | 143(55)<br>117(45) |
| Work setting | Private<br>Semiprivate<br>Government | 182(70)<br>40(15.38)<br>38(14.62) |

Table 1. Of the 260 participants, 106 were males and 154 females, with age brackets between the ages of 20 and 30 (68.85%). By appointment, 120 were regular dentists, 126 specialists, and only 14 were out of the consultant category. Similarly, 120 were graduates and 140 were postgraduates and 182 dentists were from private institutions, 40 were independent and 38 were

working in government. Out of total, 143 were at hospital practice and 117 were practicing at their own clinics (Table 1). The current study did not report a significant relationship (rho-0.2), (P 0.61) between the responses of gender dental professionals and their level of education.

Table 2. Dental and anxiety specialist dental tests n = 260

| Questions | Yes (%) | No (%) | Don't know/ Unaware (%) |
|---|---|---|---|
| Are You Afraid of Getting Infected with COVID-19 from a Patient and Co-Worker? | 218(83.85) | 41(15.77) | 1(0.38) |
| Are You Anxious When Providing Treatment to a Patient who is Coughing or Suspected of being Infected with COVID-19? | 234(90) | 23(8.85) | 3(1.15) |
| Do You want to Close Your Dental Practice until the Number of COVID-19 Cases Starts Declining? | 163(62.69) | 94(36.15) | 3(1.15) |
| Do You Feel Nervous when Talking to Patients in Close Vicinity? | 188(72.31) | 67(25.77) | 5(1.92) |
| Do You have Fear that You Could Carry the Infection from Your Dental Practice back to Your Family? | 244(93.85) | 16(6.15) | 0(0) |
| Are You Afraid of Getting Quarantined if get Infected | 158(60.77) | 93(35.77) | 9(3.46) |
| Are You Anxious about the Cost of Treatment if You Get Infected? | 207(79.62) | 44(16.92) | 9(3.46) |
| Do You feel Afraid when you Hear that People are Dying Because of COVID-19? | 237(91.15) | 23(8.85) | 0(0) |

Table 2 Describes level of fear and anxiety of dental professionals in relation to COVID-19 pandemic situation; 83.85% participants were afraid of COVID-19 infection from a patient or colleague. 90% were concerned while treating a cough or a patient suspected of being infected with COVID-19. More than 72.31% of participants felt nervous when talking to nearby patients, 93.85% were afraid of carrying the virus from dental practice to their families, and 60.77% were afraid of being isolated alone if they became infected. 79.62% practitioner, were worried about the cost of treatment if they were infected. While 91.15% felt frightened while learning about mortality due to COVID-19. The majority of dentists (62.69%) wanted to close their dental procedures until the number of cases of COVID-19 began to decline.

Table 3. Information and practice of dentists regarding COVID 19 n = 260

| Questions | Yes (%) | No (%) | Don't know/ Unaware (%) |
|---|---|---|---|
| Are You Aware of the Mode of Transmission of COVID-19? | 256(98.46) | 4(1.54) | 1(0.38) |
| Are You Updated with the Current CDC or WHO Guidelines for Cross-Infection Control regarding COVID-19? | 239(91.92) | 12(4.62) | 9(3.46) |
| Are You currently Asking every Patient's Travel History before Performing Dental Treatment? | 239(91.92) | 18(6.92) | 3(1.15) |
| Are You currently Taking every Patient's Body Temperature before Performing Dental Treatment? | 241(92.69) | 15(5.77) | 4(1.54) |
| Are You Deferring Dental Treatment of Patients Showing Suspicious Symptoms? | 246(94.62) | 12(4.62) | 2(0.77) |
| Do You Think Surgical Mask is enough to Prevent Cross-Infection of COVID 19 | 86(33.08) | 166(63.85) | 8(3.08) |
| Do You Think N-90 Mask should be Routinely Worn in Dental Practice due to the Current Outbreak? | 242(93.08) | 10(3.85) | 8(3.08) |
| Have You Ever Worn an N-90 Mask while Treating a Patient in Your Dental Practice? | 245(94.23) | 11(4.23) | 4(1.54) |
| Do You Routinely Follow Universal Precautions of Infection Control for Every Patient? | 237(91.15) | 13(5.00) | 10(3.85) |
| Do You Use Rubber Dam Isolation for Every Patient? | 99(38.08) | 159(61.15) | 2(0.77) |
| Do You Use High-Volume Suction in Your Practice for Every Patient? | 120(46.15) | 133(51.15) | 7(2.69) |
| Do You Ask Every Patient to Rinse His/her Mouth with Anti-Bacterial Mouthwash before Treatment? | 233(89.62) | 21(8.08) | 6(2.31) |
| Do You Wash Hands with Soap and Water/Use Sanitizer Before and After Treatment of Every Patient? | 255(98.08) | 1(0.38) | 4(1.54) |
| Are You Aware of which Authority to Contact if You Come Across a Patient with Suspected COVID-19 Infection? | 230(88.46) | 13(5) | 17(6.54) |

Table 3 contains a description of the dental professional information about COVID-19; 98.46% knew their mode of transmission, and 91.92% were reviewed by current CDC or WHO guidelines for controlling contagious infections. Similarly, 91.92% preferred to enquire about the patient's mobility history, 92.69% recorded the patient's entire body temperature before dental treatment, and 94.62% postponed dental treatment in patients who revealed suspicious symptoms. In terms of using personal protection, 63.85% believe that the surgical mask is not sufficient to prevent COVID-19 infection. In comparison, 93.08% preferred the use of the N-95 mask with standard dental procedures during the current outbreak. In contrast, 4.23% reported not wearing an N-95 mask while treating a patient. Although the majority, 91.15% recommended standard international safety measures for infection control, 61.15 did not apply the rubber pool

sseparation to entire patients. 46.15% of participants used high volume absorption throughout the patient. However, 8.08 did not require patients to wash their mouths with antibacterial mouthwash prior to dental treatment. 98.08% of participants practiced hand washing with soap and water or disinfectant before and after treatment of patients, while 88.46% of participants knew the appropriate authority to communicate when they came in contact with a patient suspected of having COVID-19.

## DISCUSSION

The current divisive study reported anxiety and fear of infection among dentists while working during the present outbreak. To the current end, a questionnaire focused on closed-ended questions was used to gather information about the dentists' fears and any changes made to combat the COVID-19 epidemic. Questionnaire-based research is proven to collect information about preferences, attitudes, opinions, and participant's knowledge; however, careful data collection and interpretation is required [12].

The effects of this current rapid spread of COVID-19, which has affected millions of people worldwide, from solitary confinement to death have resulted in severe psychological distress and fear. As the foremost route of transmission of corona virus is by droplets and aerosols [13], this increases the probabilities of dentists and dental health workers becoming infected and continuing to spread the virus. Recent research has found that a lot of dentists are fearful of getting infected by their patients or colleagues [14]. Most dentists are afraid to offer treatment to any patient who reports suspicious symptoms. As COVID-19 is rapidly infecting a lot people across the country, the fear of infection is justified. A high level of tension was seen as a lot of proportion of dentists sought to shut their practice which could have a major economic impact on dentists and dental health professionals.

Current guidelines on the outbreak of COVID-19 have suggested that everywhere non-essential dental treatments to be discontinued, and only patients having pain, inflammation, bleeding, and trauma are advised to be treated [15]. In the present scenario, all special or non-essential dental treatment for all patients should be postponed until the condition is reversed or within control. A study by the Beijing Emergency Department, China [16], saw the impact of the COVID-19 pandemic on dental reporting, which dropped in the emergency department compared to pre-COVID-19 reporting. The corona virus resides in various locations for a few hours to few days [17]. These, combined with the long incubation period before symptoms appear, are factors that make it extremely difficult to limit its spread. Fear of confinement because of a suspected illness or infection is also a legitimate fear when one thinks of how other members of family might suffer due to numerous factors. The burden on the health care system and also the costs incurred during treatment put a human mind at danger. Health facilities might not be fully funded by the government worldwide and as a result insignificant financial burden.

The COVID-19 testing is widely sponsored by government agencies in many countries around the world, which inspire citizens to get tested for COVID-19 if they are suspected of being infected. A positive feature that was also included within the current study was that almost all participants were conscious of the distribution and transmission of COVID-19. As a part of infection control measures, such information is crucial during dental practice. It is important

within the face of this pandemic to still follow procedures and guidelines that concentrate on reducing the quantity of aerosol produced and to deal with it effectively. Similarly, it absolutely was encouraging that a lot number of dentists were responsive to this guidelines issued by the Disease Control (CDC) and WHO for the control of dental infection in dental work including questioning patient history and recording patients' body temperature[18]. Thus, both of those facts may provide a summary of probably infected patients and their prudent management of dental work. However, standard safety measures that have already been recommended and approved by various disease control and control authorities around the world to prevent dental infection in dentistry should be strictly adhered to in the current environment.

Although most dentists have agreed that these safety precautions should be taken in every patient, unfortunately, a large number of participants reported that they do not use the basic methods of infection such as the rubber dam in every patient. The use of a rubber dam is an effective means of controlling the infection by cutting down the spread of aerosols through a patient's acceptance of dental procedures. Considering the benefits, there is no reason not to use a rubber dam during dental procedures, especially when using rotary tools that produce large quantities of aerosols and drops. The use of high volume suction is also considered an important means of controlling aerosol loss during dental procedures and should be used by most patients at the beginning of any dental procedure, oral mouthwash baths also significantly reduce microbial load [19, 20]. This practice is recommended in this pandemic; however, most dentists have reported neglect.

There is currently no evidence available on the effects of oral antibodies commonly used in COVID 19. Therefore, this recommendation may be based on the fact that fraud has been reported to reduce viral load and spread by removing oropharyngeal protease and related viral replication[21]. In addition, mouthwash containing agents with anti-viral activity such as povidone-iodine has been shown to be effective against various respiratory infections[22,23]. During the outbreak of COVID-19, the importance of hand hygiene has been repeatedly emphasized and this is even more important in the case of dentists. Studies have shown that proper hygiene of the hands, including washing hands with soap and water and cleaning with alcohol-based antibiotics, is an important step in controlling the spread of respiratory infections, including SARS [24, 25].

Therefore, the WHO recommends regular hand washing or the use of an alcohol-based disinfectant for dental work. The use of a respirator with a component similar to N-95 is recommended for the treatment of patients suspected of having COVID-19. Periodic procedures using ultrasonic scalers should be replaced with hand scalers that aim to reduce the production and distribution of aerosol and splatter. In addition to regular use of the rubber dam, high volume absorption helps to maintain aerosols and prevent droplets from the patient's mouth and respiratory tract from spreading and transmitting potential infections.

This study highlights the importance of the dentist's fears and anxieties during outbreaks of infectious diseases. Fear among dentists may have long-term consequences and, as such, will have future training implications, such as the need to provide mental health workshops to promote independence and increase mental health education as part of primary dental education.

## CONCLUSION

Majority of Dentist practicing in government and private sectors in spite of having knowledge and practice experience faced anxiety and fear during COVID 19 pandemic situation. In this current study, most of the practitioners have modified their existing practice with reinforcement usage of N 95 mask, rubber dam, high volume suction, anti bacterial mouth wash, hand wash and sanitizer before and after treatment. Dentist referred suspected COVID19 infection to appropriate authority centre. In the current situation a few dental procedures have changed their services according to the recommended guidelines.

**REFERENCES**


1. Peng, X.; Xu, X.; Li, Y.; Cheng, L.; Zhou, X.; Ren, B. Transmission routes of 2019-nCoV and controls in dental practice. Int. J. Oral. Sci. 2020, 12, 9.

2. Chen, N.; Zhou, M.; Dong, X.; Qu, J.; Gong, F.; Han, Y.; Qiu, Y.; Wang, J.; Liu, Y.; Wei, Y.; et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: A descriptive study. Lancet 2020, 395, 507–513.

3. Russell, B.; Moss, C.; Rigg, A.; Hopkins, C.; Papa, S.; Van Hemelrijck, M. Anosmia and ageusia are emerging as symptoms in patients with COVID-19: What does the current evidence say? Ecancermedicalscience 2020, 14, ed98.

4. Alhazzani, W.; Møller, M.H.; Arabi, Y.M.; Loeb, M.; Gong, M.N.; Fan, E.; Oczkowski, S.; Levy, M.M.; Derde, L.; Dzierba, A.; et al. Surviving Sepsis Campaign: Guidelines on the management of critically ill adults with Coronavirus Disease 2019 (COVID-19). Crit. Care Med. 2020.

5. Fallahi, H.R.; Keyhan, S.O.; Zandian, D.; Kim, S.G.; Cheshmi, B. Being a front-line dentist during the Covid-19 pandemic: A literature review. Maxillofac. Plast. Reconstr. Surg. 2020, 42, 12.

6. Meng, L.; Hua, F.; Bian, Z. Coronavirus disease 2019 (COVID-19): Emerging and future challenges for dental and oral medicine. J. Dent. Res. 2020, 99, 481–487.

7. Xu, H.; Zhong, L.; Deng, J.; Peng, J.; Dan, H.; Zeng, X.; Li, T.; Chen, Q. High expression of ACE2 receptor of 2019-nCoV on the epithelial cells of oral mucosa. Int. J. Oral. Sci. 2020, 12, 8.

8. Kampf, G.; Todt, D.; Pfaender, S.; Steinmann, E. Persistence of coronaviruses on inanimate surfaces and its inactivation with biocidal agents. J. Hosp. Infect. 2020, 104, 246–251.

9. Fazel, M.; Hoagwood, K.; Stephan, S.; Ford, T. Mental health interventions in schools in high-income countries. Lancet Psychiatry 2014, 1, 377–387.

10. Ng, K.; Poon, B.H.; Kiat Puar, T.H.; Shan Quah, J.L.; Loh, W.J.; Wong, Y.J.; Tan, T.Y.; Raghuram, J. COVID-19 and the Risk to Health Care Workers: A Case Report. Ann. Intern. Med. 2020.

11. Ahmed MA, Jouhar R, Ahmed N, Adnan S, Aftab M, Zafar MS, Khurshid Z. Fear and practice modifications among dentists to combat novel coronavirus disease (COVID-19)

outbreak. International journal of environmental research and public health. 2020 Jan;17(8):2821.

12. Lydeard, S. The questionnaire as a research tool. Fam. Pract. 1991, 8, 84–91.

13. Ge, Z.; Yang, L.; Xia, J.; Fu, X.; Zhang, Y. Possible aerosol transmission of COVID-19 and special precautions in dentistry. J. Zhejiang Univ. B 2020, 1–8.

14. Person, B.; Sy, F.; Holton, K.; Govert, B.; Liang, A.; Garza, B.; Gould, D.; Hickson, M.; McDonald, M.; Meijer, C.; et al. Fear and Stigma: The Epidemic within the SARS Outbreak. Emerg. Infect. Dis. 2004, 10, 358–363.

15. Madarati, A.; Abid, S.; Tamimi, F.; Ezzi, A.; Sammani, A.; Shaar, M.; Zafar, M. Dental-Dam for Infection Control and Patient Safety during Clinical Endodontic Treatment: Preferences of Dental Patients. Int. J. Environ. Res. Public Health 2018, 15, 2012.

16. Guo, H.; Zhou, Y.; Liu, X.; Tan, J. The impact of the COVID-19 epidemic on the utilization of emergency dental services. J. Dent. Sci. 2020.

17. van Doremalen, N.; Bushmaker, T.; Morris, D.H.; Holbrook, M.G.; Gamble, A.; Williamson, B.N.; Tamin, A.; Harcourt, J.L.; Thornburg, N.J.; Gerber, S.I.; et al. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. N. Engl. J. Med. 2020.

18. Guan, W.; Ni, Z.; Hu, Y.; Liang, W.; Ou, C.; He, J.; Liu, L.; Shan, H.; Lei, C.; Hui, D.S.C.; et al. Clinical Characteristics of Coronavirus Disease 2019 in China. N. Engl. J. Med. 2020.

19. Marui, V.C.; Souto, M.L.S.; Rovai, E.S.; Romito, G.A.; Chambrone, L.; Pannuti, C.M. Efficacy of preprocedural mouthrinses in the reduction of microorganisms in aerosol: A systematic review. J. Am. Dent. Assoc. 2019, 150, 1015–1026.e1.

20. Azimi, M.; Jouybari, L.; Moghadam, S.; Ghaemi, E.; Behnampoor, N.; Sanagoo, A.; Hesam, M. Antimicrobial effects of chlorhexidine, matrica drop mouthwash (chamomile extract), and normal saline on hospitalized patients with endotracheal tubes. Iran. J. Nurs. Midwifery Res. 2016, 21, 458.

21. Eggers, M.; Koburger-Janssen, T.; Eickmann, M.; Zorn, J. In Vitro Bactericidal and Virucidal Efficacy of Povidone-Iodine Gargle/Mouthwash against Respiratory and Oral Tract Pathogens. Infect. Dis. Ther. 2018, 7, 249–259.

22. Kitamura, T.; Satomura, K.; Kawamura, T.; Yamada, S.; Takashima, K.; Suganuma, N.; Namai, H.; Komura, Y.; Great Cold Investigators-I. Can We Prevent Influenza-like Illnesses by Gargling? Intern. Med. 2007, 46, 1623–1624.

23. Wood, A.; Payne, D. The action of three antiseptics/disinfectants against enveloped and non-enveloped viruses. J. Hosp. Infect. 1998, 38, 283–295.

24. Fung, I.C.-H.; Cairncross, S. Effectiveness of handwashing in preventing SARS: A review. Trop. Med. Int. Health 2006, 11, 1749–1758.

25. Jefferson, T.; Foxlee, R.; Del Mar, C.; Dooley, L.; Ferroni, E.; Hewak, B.; Prabhala, A.; Nair, S.; Rivetti, A. Interventions for the interruption or reduction of the spread of respiratory viruses. Cochrane Database Syst. Rev. 2007.