

Attitude and practice of disinfection protocol for different impression materials among practicing dentists in Tamil Nadu - A cross sectional survey.

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Abstract

Aim:

The purpose of this survey was to find the attitude and practice of impression disinfection protocol employed by the practicing dentists in their clinical practice in Tamil Nadu.

Materials and Methods:

Self-administered validated online website based questionnaires were circulated among dentists practicing in Tamil Nadu. The questions were taken up by dentists who were willing to participate in the survey and a total of 200 responses were recorded. There were two sections to the questionnaire: one included demographic information and the other featured questions regarding the disinfection protocol. The responses were recorded in excel sheet followed by statistical analysis of the data.

Results:

97.5% of the dentists routinely rinse the impression with running tap water before sending it to the lab/ prior pouring the cast and 2.5% dentists do not rinse the impressions. 78.9% dentists routinely disinfect the working impressions, whereas 21.1% do not disinfect the working impressions before sending it to the laboratory/ before pouring the casts. 48.2% of the dentists stated that they are unsure whether their lab workers disinfect their preliminary/working impression before pouring casts. 46.9% dentists stated that they do not have disinfection guidelines in their clinic. 81.4% believe that covid-19 spreads by saliva and 73.9% dentists have changed the disinfection protocol for impressions after covid-19.

Conclusion:

It was found that the majority of respondents rinsed and disinfected the impression with running water and disinfected it on a regular basis for 1-10 minutes. This study also indicates a lack of interaction between the dentists and dental technicians about the information on the disinfection status of the impression sent, as well as a need for increased awareness in order to reduce the disease transmission in dental laboratories. Significant number of dentists have changed their disinfection protocol after covid-19 pandemic.

Keywords: Disinfection, Impression, Dental impression, Dentist, Dental technician.

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Email address: - suryar2@srmist.edu.in **Phone no:** 9789972493. **DOI:** 10.5281/zenodo.6984690

Submitted: 20-June-2022 **Revised:** 5-Jul-2022 **Accepted:** 1-Aug-2022 **Published:** 15-Aug-2022

Bibliographic details: Journal of Orofacial Rehabilitation Vol. 2(2), Aug 2022, pp. 2-11.

Introduction

Impression making is one of the commonest procedures performed by dentists on a daily basis. Impressions can serve as transmission vehicles for a variety of microorganisms. One

millilitre saliva of healthy individual contains around 750 million microbes.^[1] Infectious microorganisms such as Streptococcus species, Klebsiella species, and Candida species have been identified in 67 percentage of materials

sent to dental laboratories.^[2] Concerns regarding the disinfection of dental impressions has grown importance because of the spread of infectious diseases. This is due to the increased knowledge of viral infections such as Human Immunodeficiency Virus (HIV), Hepatitis B and C (HBV and HCV), and severe acute respiratory syndrome (SARS).^[3]

Furthermore, there is a constant growth in the number of people seeking dental treatment so it is necessary to raise awareness to the dentists of the extra care that must be taken while treating patients.^[4] These safeguards are required to protect both patients and professionals. Despite the fact that numerous guidelines and recommendations for infection control are released by medical and dental associations as well as governmental bodies, research have shown that infection control is lacking in some dental offices and hospitals.^[5]

Cross infection between dentist and patients can occur as a result of infected materials being transported from dental laboratory to dental offices.^[6] Patient safety is essential in medical profession and it aims to improve the quality of patient care, eliminate unnecessary errors, and enhance the safety.^[7] Infectious diseases are a major public health issue that many nations healthcare organisations are dealing with.^[5]

Contamination and cross contamination can be avoided by disinfecting and labelling the impressions as “disinfected” as soon as they are retrieved from the patient’s oral cavity. This approach reduces any ambiguity that dental technicians may have while receiving impressions and can help to avoid the need for repeated disinfection.^[8]

In most dental offices, simply washing the impression under running tap water has become a standard procedure. Tap water, on the other hand, only eliminates 40% of the germs present, according to research. As a result, contaminated impressions and casts serve as vehicles for the spread of germs and viruses between clinics and dental laboratories.^[9]

Chemical disinfection is the most effective option that is also the easiest to use in practise. Immersion or spraying the solution are viable options. Various impression materials require different times and methods for decontamination.^[10] Though all of these protocols are taught in dentistry schools, it is important to examine whether they are followed in practise since infection propagation must be avoided in every way possible.

The aim of this study was to determine the practice and protocol of various impression disinfection procedures employed by practising dentists in their clinical practise prior to pouring casts.

Materials and methods:

The current cross-sectional study was conducted by the distribution of validated online questionnaires to dentists practicing in Tamil Nadu. The online questionnaire was circulated through google forms and those who were willing to participate were included in this study and the details of the dentist were kept confidential without revealing the identity. There were two sections to the questionnaire. Section one included demographic information such as the dentists' qualifications, age, and years of experience. Section two featured questions concerning dentists' disinfection policies and practice for various impression materials; and disinfection techniques following covid-19. The returned questionnaires were reviewed for any repetition. A total of 200 completed surveys were statistically analysed and the results were tabulated after entry of the responses into excel sheet.

Results:

In the current study, 200 dentists responded to the survey. The data was transferred to excel format; data was analysed using SPSS software (SPSS Statistics, Version 22.0, IBM). Descriptive statistics for the survey was done to create pie-charts and frequency tables according to the percentage of answers received for each

question. Among the participants, 71.5 percent of the 200 dentists who took part in the study were general dentists, 6.0% were orthodontists, 5% periodontists, 4% prosthodontists, 3.5% endodontists, 3.5% pedodontists, 3.0% oral pathologists, 2.0% oral medicine and radiologists, 1% oral and maxillofacial surgeons and 0.5% public health dentists (Chart 1). 88.5% dentists had 1-5 years of experience, 8.5% had 6-10 years, 2.5% had 11-20 years and 0.5% had greater than 20 years of experience (Chart 2). Majority of the participants belonged to the (93.0%) 20-30 years old age group (Chart 3).

Table 1 show the questions and responses about disinfection methods used by the dentists for preliminary or working impressions. It was found that 97.0% dentists routinely pour the preliminary or working impressions and 3.0% do not pour the preliminary or working impression. 97.5% of the dentists routinely rinse the impression with tap water before sending it to the laboratory or before pouring the cast and 2.5% dentists do not rinse the preliminary or working impressions. 78.9% dentists routinely disinfect the working impressions, whereas 21.1% do not disinfect the working impressions before sending it to the laboratory/ before pouring the casts. Of which 7.0% used disinfectant spray, 4.7% immersed the impression in disinfectant, 71.9% rinsed under running water and sprayed with disinfectant and 16.4% rinsed under running water and immersed in disinfectant. It was found that 66.9% dentists disinfect the working or preliminary impressions for one minute; 30.2% disinfect for ten minutes; 2.3% disinfect for thirty minutes and 0.6% disinfect for sixty minutes. 54.5% dentists notify the laboratory that the impression sent is disinfected while 45.5% do not notify the laboratory that the impression sent is disinfected. 22.1% dentists interpret that their laboratory technician will disinfect the impression before pouring, 29.7% dentists say that their laboratory technician do not disinfect the preliminary or working impression before pouring the cast and 48.2% dentists aren't sure

regarding the disinfection of the preliminary or working impressions by their laboratory technicians.

Table 2 reveals the awareness of dentists about proper methods of disinfection of impressions. It was found that 78.4% dentists disinfected their alginate impressions while 21.6% do not disinfect their alginate impressions. 12.3% dentists disinfected the alginate impressions by spraying with disinfectant, 3.1% disinfected by immersing in disinfectant; 74.7% disinfected by rinsing under running water and spraying with disinfectant while 9.9% dentists rinsed under running water and immersed in disinfectant. 72.5% dentists routinely disinfected their rubber base impression materials, 27.5% dentists do not disinfect their rubber base impression materials; in which 10.4% sprayed with disinfectant, 2.8% sprayed and immersed with disinfectant, 61.1% rinsed under running water and sprayed with disinfectant and 25.7% rinsed under running water and immersed in disinfectant.

Table 3 shows the infection control measures followed in the dental clinic. It is seen that 51.5% dentists wore gloves while disinfecting impressions and pouring the cast, 33.5% seldom wear gloves while disinfecting and 14.9% never wear gloves while disinfecting impressions and pouring the cast. 53.3% dentists have disinfection instructions at their clinic, 46.9% do not have disinfection instructions at their clinic. 19.8% used alcohol as chemical disinfectant for impressions, 41.1% used glutaraldehyde as chemical disinfection, 19.8% used sodium hypochlorite, 19.3% used chlorhexidine and none of the dentists use iodophor as chemical disinfectant for impressions.

Table 4 reveals disinfection of impressions after covid-19. It is evident that 81.4% believed that covid-19 spreads by saliva, 3.5% think that covid-19 doesn't spread by saliva and 15.1% believed that covid-19 might spread by saliva. 73.9% dentists have changed their disinfection protocol for impressions after covid-19 while 26.1% dentists haven't changed the disinfection protocol for impressions after covid-19.

Discussion:

In dental laboratories, impressions have been recognized as the major source of infection.^[11] To protect technicians from becoming infected with infectious illnesses, disinfection techniques have been established.^[12] Cross contamination can occur between patients and dentists or from the dental office to laboratory employees or it can be vice versa.^[13] The amount of health education among patients is increasing, as is their worry for their safety while undergoing treatment. In the present investigation, respondents' level of education was substantially related to their degree of awareness regarding infection prevention in dentistry.^[14] According to the American dental association (ADA) recommendations, impressions should be washed under running water to remove saliva, debris and blood, and then disinfected prior to getting submitted to the labs.^[15] As a result, washing and rinsing an impression under running water can be routinely followed to eliminate most of the microbes.^[16] In this study majority of the participants were young general dentists with clinical experience within 5 years and they were following disinfection protocol of rinsing the impression followed by disinfection with disinfectants for 1-10 minutes. Prior to pouring or sending the impression to the laboratory, most of the participated dentists consistently washed and disinfected the impression under plain running tap water; followed by clinicians, who rinse the impression under running water and spray with disinfectant; followed by dentists rinsing the impression under running water and immersing in the disinfectant. The impressions were majorly disinfected for 1-10 minutes. Studies have been reported on the effect of disinfectant immersion time on the quality of the impression (Minimum: 5-10 minutes and Maximum: 30-60 minutes); it was found that there was no influence on the immersion time on the quality of the impression

or surface details.^[17-19] Interaction amongst dentists and their laboratory workers on specific disinfection measures used might be beneficial in reducing cross-infection. In this regard, 48.2 percent of the dentists polled stated that they are unsure whether their laboratory workers sterilise their preliminary/working impression before pouring. Furthermore, laboratories can communicate with the dental clinics regarding the disinfection status or requirements so that their actions can be synchronized to some level.^[8]

Furthermore, most of the dentists reported that they disinfect alginate impressions in which 74.7% disinfect by rinsing it under running water and spraying it with disinfectant. In regards with the rubber base impression materials majority agreed that they disinfect rubber base impressions and the method commonly employed for disinfection is rinsing it under running water followed by spraying with disinfectant.

The use of protective materials, such as gloves, is an apparent supplementary strategy in protecting the dental worker against infection. In this regard 51.5% dentists have claimed that they wear gloves while disinfecting impressions and pouring casts. Pertaining to the adequacy of guidelines in dental laboratories for disinfection methodologies of various impression materials, there was a significant difference of opinions among them, with the significant proportion of dentists (53.3 percent) agreeing on the fact that they have disinfection instructions in their clinic and the majority of the dentists polled stating that they do not have disinfection guidelines in their clinic. Therefore, in this scenario, it may be beneficial for dental offices to adhere to the ADA standards on how certain impression materials should be disinfected in order to manage the objectives of health and accuracy.^[6,20] Use of Chemical disinfectant is one of the most effective methods of disinfection.^[21] In regards with the chemical disinfection, majority of the dentists opted for glutaraldehyde, followed by alcohol and sodium hypochlorite

both being equally used as a chemical disinfectant.

Concerning the view of spread of covid-19 through saliva, most of the dentists believed that covid-19 spreads by saliva and 73.9% dentists stated that they changed their impression disinfection protocol post covid-19 pandemic. Dentists have to focus on routine infection control measures and precautions to be taken in the dental clinics to protect the patients, as well as the dental staff in the clinic as the aerosols may contain the SARS-CoV-2 virus.^[22-24] As a consequence, there is a considerable risk of cross infection among dentists, dental employees, and patients.^[25]

Future studies can be done with large number of sample size covering different age groups of practicing dentists and also to evaluate the relation between different years of clinical practice. There can be studies comparing the protocol followed before and after Covid 19.

Conclusion:

With the above-mentioned findings, it can be concluded that the vast majority of the participated practicing dentists consistently washed and disinfected the impression with running tap water and disinfected it routinely for 1-10 minutes. The study's findings indicate a lack of interaction amongst dentists and dental technicians, as well as a need for increased awareness and training programmes for both groups in order to reduce the threat of disease transmission in dental laboratories.

Notable number of the dentists stated that they do not have disinfection guidelines in their clinic which can be improvised by creating awareness among the dentists regarding the disinfection protocol to be followed for various impression materials. Majority of the dentists used glutaraldehyde as a chemical disinfectant. The present results also indicated that majority of the dentists believe that covid-19 spreads through saliva and that they have changed their disinfection protocol due to covid-19 pandemic.

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Chart 1: Qualification details of the Participants

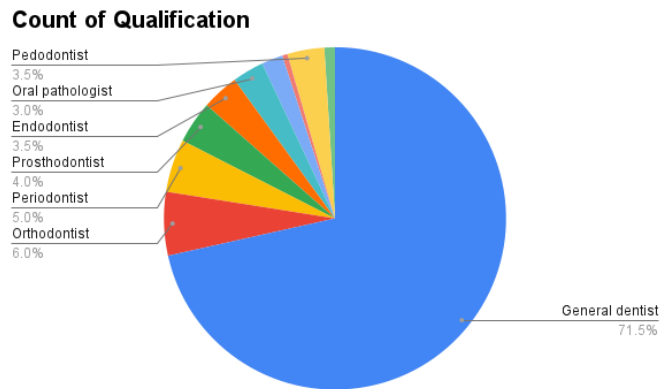


Chart 2: Years of Clinical Experience of Participated Dentist

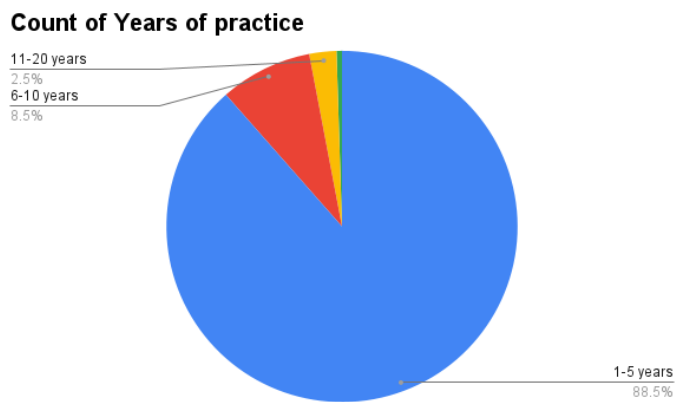
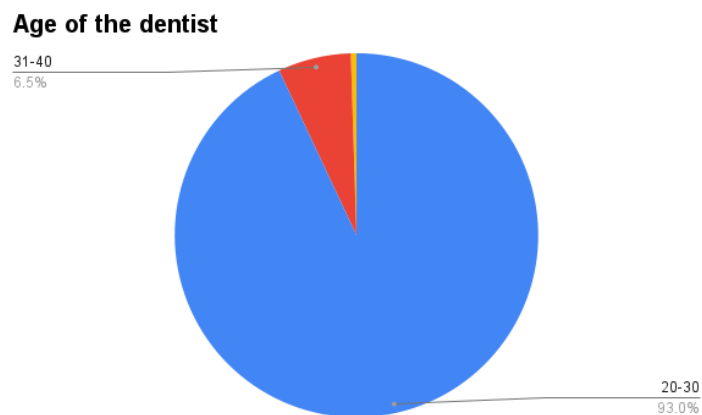


Chart 3: Age of the Participated Dentists



TABLES:**Table 1: Questions and responses about the disinfection protocol followed used by the dentists and awareness of laboratory disinfection procedures**

Questions	Choices	Count	Frequency
Do you pour the preliminary/ impression in your clinic?	Yes	194	97.0%
	No	6	3.0%
Do you rinse your preliminary/working impression with tap water before sending to the lab/ before pouring the cast?	Yes	195	97.5%
	No	5	2.5%
Do you routinely disinfect your impression prior to sending to lab/ before pouring the cast?	Yes	157	78.9%
	No	42	21.1%
If “Yes”, how would you disinfect your preliminary/ working impression?	Spray with disinfectant	12	7.0%
	Immerse in disinfectant	8	4.7%
	Rinse under running tap water followed by Spraying with disinfectant.	123	71.9%
	Rinse under running tap water followed by immersion in disinfectant	28	16.4%
For how long do you disinfect?	One minute	115	66.9%
	Ten minutes	52	30.2%
	Thirty minutes	4	2.3%
	Sixty minutes	1	0.6%
Do you notify the laboratory that the impression you are sending is disinfected?	Yes	104	54.5%
	No	84	45.5%
Does your laboratory technician disinfect your impression before pouring?	Yes	43	22.1%
	No	58	29.7%
	Not sure	94	48.2%

Table 2: Questions and responses about the awareness of Dentists about the methods of disinfection of impressions

Questions	Choices	Count	Frequency
Do you disinfect alginate impressions?	Yes	156	78.4%
	No	43	21.6%
If “Yes”, what method do you use for alginate impressions disinfection?	Spray with disinfectant	20	12.3%
	Immerse in disinfectant	5	3.1%
	Rinse under running water followed by Spraying with disinfectant	121	74.7%
	Rinse under running water followed by immersion in disinfectant	16	9.9%
Do you disinfect rubber base impressions?	Yes	140	72.5%
	No	53	27.5%
If “Yes”, what method do you use for rubber base impressions disinfection?	Spray with disinfectant	15	10.4%
	Use both Disinfectant Spray and immersion Technique	4	2.8%
	Rinse under running tap water followed by use of disinfectant spray	88	61.1%
	Rinse under running tap water followed by immersion in disinfectant	37	25.7%

Table 3: Questions and responses about the infection control measures followed in the dental clinic

Questions	Choices	Count	Frequency
Do you wear gloves while disinfecting your impressions and pouring the cast?	Always	100	51.5%
	Sometimes	65	33.5%
	Never	29	14.9%
Do you have disinfection instructions at your clinic/ Lab	Yes	105	53.3%
	No	92	46.9%
Chemical disinfectant used in your practice for impression	Alcohol	38	19.8%
	Glutaraldehyde	79	41.1%
	Sodium hypochlorite	38	19.8%
	Iodophor	0	0
	Chlorhexidine	37	19.3%

Table 4: Questions and responses about the disinfection of impressions after covid-19.

Questions	Choices	Count	Frequency
Do you think Covid-19 spreads by saliva	Yes	162	81.4%
	No	7	3.5%
	May be	30	15.1%
Have your impression disinfection protocol changed after Covid -19	Yes	147	73.9%
	No	52	26.1%