KNOWLEDGE, ATTITUDE, AWARENESS ON EFFECTIVE DISINFECTION OF DENTAL IMPRESSION AGAINST CORONA VIRUS AMONG CLINICAL DENTAL STUDENTS-A CROSS SECTIONAL STUDY.

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Abstract

Background: Infection control practices has become crucial in clinical dentistry as there is an increase in the prevalence of novel infectious and pandemic diseases. This commands a robust knowledge on precautionary measures against the situation. **Aim & Objectives:** The aim is to evaluate the awareness, knowledge and attitude of the undergraduate dental students toward infection control measures in the Prosthodontic clinic and to assess their satisfaction toward applying these measures during Prosthodontic treatment.

Materials and Methods: A questionnaire- based cross sectional study was conducted among 135 third, fourth and fifth year dental students in December 2023 in Sri Venkateshwaraa Dental college, Puducherry. It includes 25 close- ended questions related to effective disinfection of dental impression to assess awareness, knowledge, and attitude toward infection control in the Prosthodontic clinic. The questionnaire was distributed among 3rd, 4th, and 5th year students and informed Consent were obtained before commencing the questionnaire.

Results: A response to the questionnaire and their perception toward infection Control by using appropriate disinfect against corona virus in the prosthodontics clinic was found based on their response. Effective disinfection and mode of disinfection and their duration to be educated to dental students before entering in to clinics.

Conclusions: Their self- assessment and satisfaction reflected their performance toward infection control policy. Most of the student follow washing but proper disinfection protocols for impression to be educated for effectiveoutcome.

Keywords: Awareness, Corona virus, dental students, Disinfection, Impression

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Introduction

Infection control and dental practice is an imperative issue that is discussed as an integral part in the field of dentistry. It is reported that 1 ml of saliva sample from the oral cavity of an average healthy individuals contains about 750 million microorganisms. Dental health workers who are involved in clinical procedures are in constant risk due to novel bacterial and viral diseases.[1] the principal route of transmission of infection from the patient to the dental professionals is through the materials used in dentistry that are in direct contact with patient's mouth, saliva, and possibly blood. It has been documented that dental personnel have a 5–10-fold chance of acquiring hepatitis B infection than the general population.[2] Dentists and other dental care givers are at risk from cross-contamination from the mouth of patients and other infected working environment in the dental office.[3,4] According to the guidelines published by the British Dental Association, "the only safe approach to routine treatment is to assume that every patient may be a carrier of an infectious disease".[5] In dental clinics, during dental procedures dentists are often exposed to patient's blood and blood-contaminated saliva which increase the chances of transmission of micro-organisms between members of the dental team and between the patients.[6,7] Educational interventions are crucially important to create high standards in infection control so that comprehension and compliance with infection control principles and development of positive attitude can prove a significant benefit in controlling cross- contamination.[8] The aim of this questionnaire study to evaluate the knowledge, awareness and attitude of disinfecting dental impression and objective was to Impart awareness and to train clinical dental students regarding effective disinfection of dental impression in clinics.

Materials and Methods

A questionnaire-based cross-sectional study was conducted among 3rd, 4th, and 5th year dental students of a Sri Venkateshwaraa Dental college, Puducherry, India. The study was conducted from March 2022 to June 2022. The decision evaluating 3rd year and 4th year dental students was because the former ones are just entering the clinical postings and the latter ones are in the last year of their under-graduation and should, therefore, have a more complete theoretical and practical background regarding disinfection to become better healthcare professionals. Even, 5th year dental students are in internship phase before completion of their degree course. Furthermore, assessments at this phase of undergraduate program may indicate the adequacy of the dental curriculum in inculcating importance of disinfection among budding dentists. The convenient sampling was done and sample comprised of 135 participants. The study was approved by the ethical committee of Sri Venkateshwaraa Medical college. The self-administered questionnaire consisted of an eight closed ended question with two choices "yes or no" and six open-ended questions. The questionnaire was divided into four sections. Section one consisted of demographic information such as gender, year of dental under graduation. Section two: included questions about information regarding their exposure in making dental impressions and their knowledge about transmission of corona virus and disinfectants used. Section three included questions on the condition effective disinfection against corona virus, mode of disinfection and duration of disinfection to assess their awareness. Section four included questions to assess their attitude of infection control policy in preventing cross contamination. The questions were created in google forms and the link with consent was sent to clinical under graduate students. The responses were received and based on the percentage the knowledge, awareness and attitude were assessed. It was pretested on a random sample of 20 dental students to ensure practicability, validity, and interpretation of responses. Data were statistically analyzed by using descriptive statistics.

Results

In this cross sectional study, out of 150 clinical dental students 135 students participated in this study. About 47.8% were III year students, 27.6% were final year students and around 24.8% are interns. Majority of clinical undergraduate students (90%) take less than 5 impressions per day (Fig.1). The choice of their disinfectants was chlorhexidiene (51.1%) followed by sodium hypochlorite (25.9%), iodine and Gluteraldehyde (19.3%) (Fig.2). Washing impression (53.3%) in running was the most preferred way of cleaning among clinical students (Fig.3). The time period of immersing impression after disinfectant majorly answered as less than 10 minutes(52.6%) followed by others answered as 10 minutes (40.7%) and remaining answered as more than 10 minutes (Fig.4) The waiting period after spraying disinfectant answered as less than 10 minutes (48.1%) followed by 45.9% answered as

10 minutes and remaining answered more than 10 minutes (Fig. 5).The effective disinfectant against corona virus among students was not known for about 32.6% and about 31.1% answered as sodium hypochlorite. (Fig.6) In assessment of awareness of communicating about disinfection of impressions or dental cast to the dental technician in order to avoid cross contamination revealed that 63% communicate about disinfection status while 37% do not communicate it. (Fig.7). By handling impression majority of the participant answered wearing gloves (73.3%) while pouring the dental cast (Fig. 8). 98.5% of the participants aware of washing in running water after making impression (Fig.9). About 97% are well known that corona virus is contagious to secretions whereas 2.25% are not aware of it. (Fig.10) The time Period of disinfection that was followed by clinical students revealed that 58% disinfected immediately, while 33.3% disinfected within 5 minutes and other disinfected within 10 minutes. (Fig.11) Types of disinfectants that are effective for different impression materials were assessed for awareness. About 81.5% are aware about different disinfectants whereas 18.5% are not aware of it. (Fig.12) About 83.7% has the attitude of informing about the disinfection status where as 16.3% said 'NO' and do not inform to dental laboratory.(Fig.13).

Discussion

They results were interpreted in order to assess the knowledge, awareness and attitude of clinical students in practicing disinfection of dental impressions. The world faced the outbreak of corona virus which bombarded the whole world by its death rate.

The virus caused various ranges of illness from asymptomatic or mild symptoms like fever, throat infection to more severe clinical manifestations, including severe respiratory distress requiring mechanical ventilation.[9] there were different variants that got mutated continuously and caused different symptoms. The corona virus is not still declared as eradicated. This virus is found in secretions where the dentist perform various procedures in oral cavity which is needed to be in utmost care with appropriate disinfection protocols. A study published in the 2020 found that SARS-CoV-2 remained viable in aerosols for up to 3 h with a half-life of 1.5 h.[10] SARS-CoV-2 virus has been detected in salivary samples of 87–100% of clinical patients.[5,6,7] Moreover, in a study it was shown that posterior oropharyngeal saliva samples on COVID-19 positive patients were serially positive for viral load from the onset of symptoms to 25 days, whereas the serum samples were positive only for 14 days.[11]

Disinfection of dental impressions is an essential routine for dental personnel who handle casts or impressions against exposure to potentially pathogenic microorganisms Washing of dental impressions under tap water was the first recommended procedure, in which microbial reduction associated with water washing was found to be considerably lower than the 40–90% reduction in microbial load stated in some literature.[12] Chemical disinfection through immersion by a glutaraldehyde-based disinfectant was found to be effective in eliminating all microbial forms for both silicone and alginate impression materials without modifying the dimensional stability. Moreover, 75% alcohol-based spray disinfectants are also suitable as effective disinfectants for impression materials. [13]

Disinfection of impression materials can be performed by dipping or spraying the materials using various disinfectants at different concentrations and dwell times. During the disinfection of impression materials, glutaraldehyde (0.5%, 2%, 2.2% and 2.45%), sodium hypochlorite (NaOCl) (0.5%, 0.525%,1%, 4% and 5.25%), chlorine compounds (0.2% chlorhexidine), hydrogenperoxide(0.5%), iodo-phores (5% and 10%), and phenol compounds (7%) can be used according to the type of impression material. It is known that different impression materials react to different disinfection methods, durations of disinfection, disinfectant types and concentrations. Therefore, the manufacturer's recommendations for dis-infection of impression materials should be followed accordingly. Recommendations accor-ding to WHO for disinfectants of different impression materials are given in tabular coloumn (Table 1).[14] In this cross sectional study, students about 51% use chlorhexidine as disinfectant and only 25% are aware of sodium hypochlorite as effective disinfectant.

Although there is a nexus of different content regarding disinfection, this study made it possible to collect the important information related to disinfection and reported the need for improving the knowledge of dental clinical students. The limitations of this cross-sectional study include that this can only prove association and not a

cause–effect relationship and that the data was collected in a limited time period, keeping in mind the effect of this outbreak involves various mutated forms and needs updated knowledge regarding disinfection and its guidelines. Furthermore, we did not receive responses from all the colleges. Hence, the generalizability of the study is limited. Clinical dental students can be trained in institutions during their undergraduate programs by creating an impression disinfection station in dental departments who handle dental impressions in order to inculcate the knowledge and developing a routine of dental impression disinfection An intraoral digital scan for implant-level impression and fixed prosthesis impressions may be a better technique to decrease the risk of transmission of diseases in the dental clinic and laboratory in the future.

Conclusion

Within the limitation and methodology of this study, the knowledge, attitude and practice of clinical dental students assessed in this institution were insufficient regarding effective disinfectants against corona viruses. Corona virus in human is novel and the knowledge and awareness of disinfecting impressions need to include in curriculum and clinical students to be trained before entering to clinical postings. The virus constantly undergoes mutation but not still eradicated. Dental students are to be trained for effective management and prevention to safeguard themselves and others.

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Table 1: Recommendations according to WHO for Disinfection of different Impression Materials

S.No	Impression Materials	Disinfectant Recommended
1	0.5% sodium hypochlorite or Iodophores	Irreversible hydrocolloids alginate by spraying
2	Iodophores or 0.5% sodium hypochlorite	Reversible hydrocolloids (Agar).
3	Iodophores and chlorine compounds	Polyethers
4	2% Gluteraldehyde, Iodophores and chlorine compounds	Zinc oxide eugenol
5	2%Gluteraldehyde, Iodophores and chlorine compounds	Silicone impression materials

Fig.1: Impressions taken per day in conservative, orthodontic and Prosthodontic department during your clinical posting

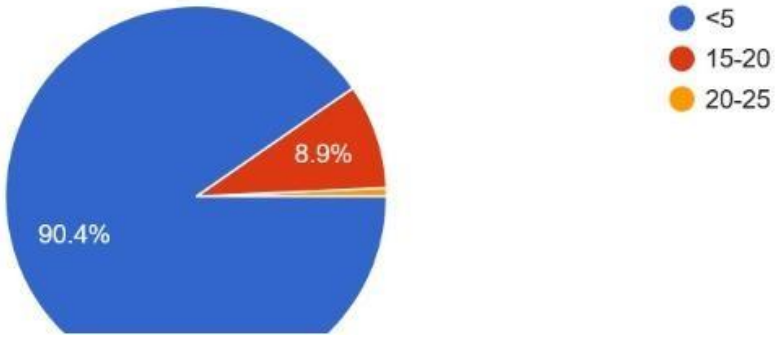

Fig.2: Choice of Impression Disinfectants

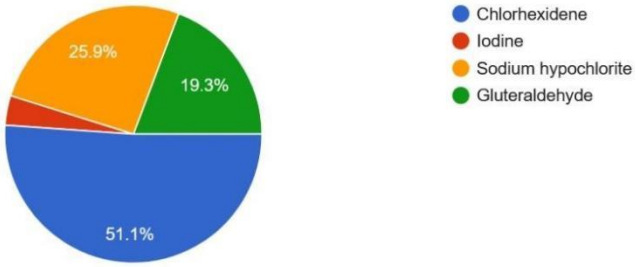

Fig.3: Mode of Disinfections

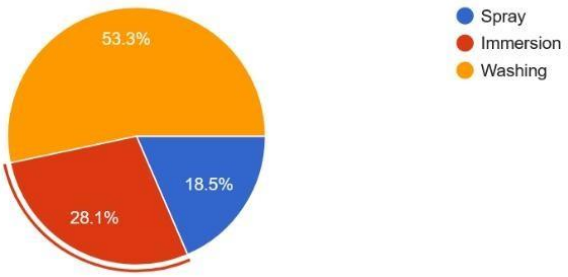

Fig. 4: Impression immersing time in disinfectants

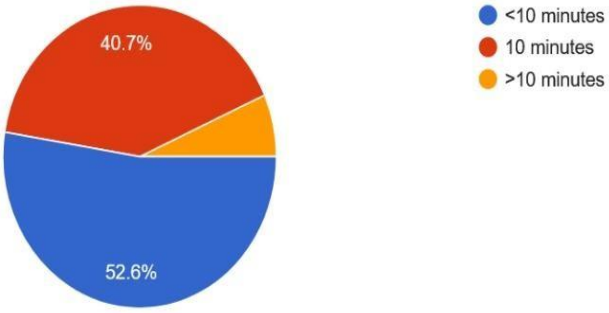

Fig.5: Waiting period after spraying disinfectant

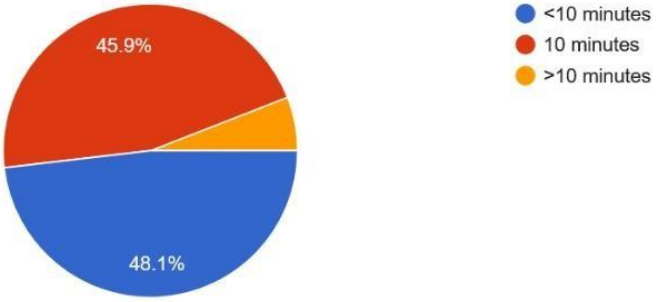

Fig.6: Disinfectant is effective against Corona Virus

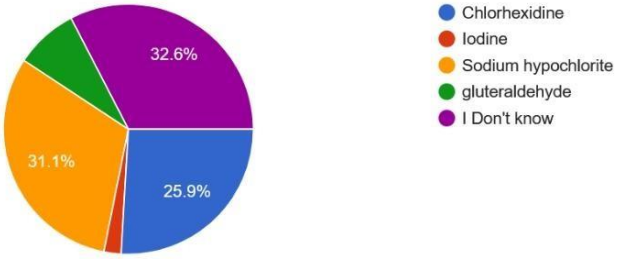

Fig.7: Communication regarding dental technician about disinfection of impression

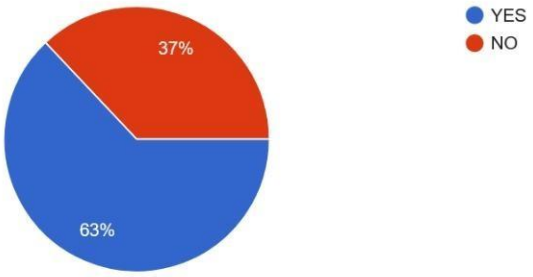

Fig.8: Wear gloves while pouring dental cast

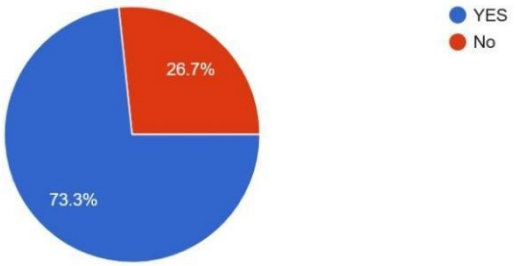

Fig.9: Washing in running water after making impression

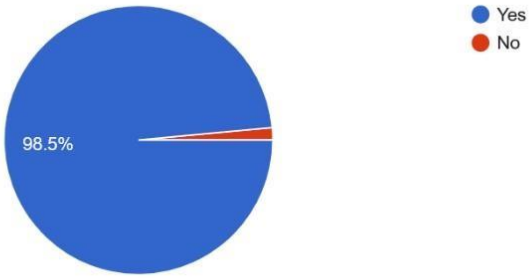

Fig.10: Corona virus is contagious through secretions

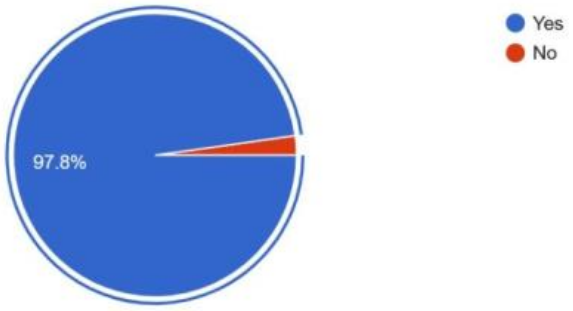

Fig.11: Period of disinfect the impression

Fig.12: Awareness of various disinfectants to clean different impression materials

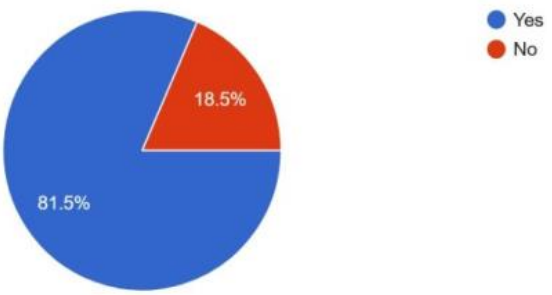

Fig.13: Aware of mentioning disinfection status of impression while sending to laboratory