



Knowledge and Awareness on Disinfection Protocols for Dental Impressions among Undergraduate Dental Students in Chengalpattu District

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ABSTRACT

BACKGROUND:Dentistry has the potential to transfer infection through dental impressions. Educating dentists on the infection control techniques may reduce the risk of infection spread.

OBJECTIVE:The purpose of this study was to find out how much dental undergraduates knew about disinfecting impression materials.

METHODOLOGY:A cross-sectional descriptive study including 181 undergraduate students from Chengalpattu district dental colleges was carried

out. A self-administered questionnaire was used to collect the data using an appropriate sample technique with 19 open-ended and closed-ended questions about the knowledge regarding the disinfection of impression materials. Variables included the awareness and the knowledge on the methods used for disinfection of impression materials, the type of disinfectant used and how important it was to disinfect the impressions before handling them. SPSS 16 was used for the statistical analysis. Following the analysis of the collected



data using descriptive statistics, the frequency tables were produced.

RESULT: Of the dental undergraduates, 111 (61.3%) are female and 70 (38.7%) are male. In terms of seniority, there are sixty-one (33.7%) 3rd year undergraduates, fifty-nine (32.6%) final year undergraduates, sixty-one (33.7%) interns. Majority of the participants show a clear response favouring "Yes," with high percentages (93.4%, 94.5%, and 92.3% respectively). "Spraying" method has the highest frequency (55.8%), followed by "Immersed" (39.2%). "Water soaked with gauze" is the dominant choice (51.9%), showing a common preference for this storage method. Variations involving combination of sodium hypochlorite with other chemicals (e.g., glutaraldehyde, iodophore) is also reported but with lesser frequencies. Across some questions, "Don't know" appears as a response, highlighting areas where education or training could be improved.

CONCLUSION: The dental undergraduates are lacking sufficient knowledge about how to properly sterilise impression materials.

KEY WORDS: Cross-infection control, Impression materials, Chemical disinfectants, Prosthodontics.

I. INTRODUCTION:

Dental professionals often get infections from coming into contact with bodily fluids like blood or saliva.¹ The main risk factors for dentists are cross-contamination from patients or from a contaminated work environment.² While contaminated surfaces, instruments, and airways are believed to indirectly spread infection, blood or saliva is thought to be a direct vector of disease. Given that dental students frequently interact with patients and medical departments, this is a major concern in the field.^{4,5} Stone cast models are polluted by dental impressions tainted with patient saliva and blood. Furthermore, numerous investigations have examined these castings microbiologically and found harmful bacteria.^{3, 4, 6} In addition to not knowing how to properly disinfect impressions, a review of 400 dental labs in the US revealed that dentists and labs also disinfect impressions for longer than is advised

because of ignorance. Many developing countries also experienced the same circumstance. Marya CM et al. in her study found that Indian dental schools did not strictly follow infection control protocols⁸ However, according to a study done by A. Saad et al⁹ in Lahore, Pakistan, among students and house officers, the infection control procedures for disinfecting do possess knowledge and are adhering to cross infection protocols for disinfecting impressions. Given the variability of data regarding cross infection control procedures of dental impressions performed in developing countries, the aim of this study is to assess the current practice of cross infection control of dental impressions and to determine the level of awareness among dental undergraduates regarding the infection control practices in the Prosthodontics department of dental institutes in Chengalpattu.

II. METHODOLOGY:

Dental undergraduates studying in the department of Prosthodontics of the dental schools in the Chengalpattu area participated in a cross-sectional survey. Dental undergraduates including third years, final years and interns, are to be included. Two colleges are visited for this study, and the ethical standards are adhered. The objectives and procedures of the study have been explained, and the administrative heads of each dental institution have previously consented. The data is gathered using a validated self-administered questionnaire. The questionnaire evaluates the participant's degree, experience in impression making, as well as their familiarity with impression techniques and material disinfection. Both the open-ended and the closed-ended questions are included, and their knowledge is not measured using a grading scheme. The statistical analysis is conducted using SPSS 16 software. Descriptive statistics are used to analyse the gathered data, and frequency tables are produced for the result.

III. RESULTS:

At the data collection sites, two hundred dental undergraduates are identified and they are given the self-administered questionnaire. Out of 200 questionnaires that are distributed, only 181



returned. Out of the dental undergraduates, 111 (61.3%) are female and 70 (38.7%) are male. The distribution among the different years of study is relatively balanced, with each group comprising approximately one-third of the total population. The study population is predominantly female, representing nearly two-thirds of the participants. There is a near-equal representation of participants across 3rd-year students, final-year students, and interns, ensuring balanced insights from each group. Table 1 provides descriptive statistics of responses collected from a study population based on a series of questions. It presents the frequencies, percentages, and p-values of the responses for each question.

TABLE 1: REPRESENTS THE DESCRIPTIVE STATISTICS BASED ON THE QUESTIONS RESPONDED BY THE STUDY POPULATION

QUESTIONS	OPTIONS	FREQUENCY	PERCENTAGE	P VALUE
Q1. HAVE U EVER MADE AN IMPRESSION?	Never	4	2.2	0.432
	Often	85	47.0	
	Sometimes	92	50.8	
Q2. DO YOU WEAR GLOVES DURING DISINFECTING THE IMPRESSION?	NO	12	6.6	0.000
	YES	169	93.4	
Q3. DO YOU WASH THE IMPRESSION WITH WATER BEFORE DISINFECTION?	No	10	5.5	0.000
	YES	171	94.5	
Q4. DO YOU DISINFECT THE IMPRESSION USING DISINFECTANTS?	No	14	7.7	0.000
	Yes	167	92.3	
Q5. HOW WILL YOU DISINFECT THE IMPRESSION USING DISINFECTANTS IN COMMON?	Immersed	71	39.2	0.043
	Spraying	101	55.8	
	UV chamber	9	5.0	
Q6. HOW MANY MINUTES WILL YOU KEEP IN DISINFECTANT?	10 MINUTES	60	33.1	
	20 MINUTES	16	8.8	
	5 MINUTES	105	58.0	



Q7. HOW DO YOU STORE THE IMPRESSION?	DISINFECTANT SOAKED WITH GAUZE	34	18.8	0.000
	Others	7	3.9	
	SEALED WITH PLASTIC BAG	46	25.4	
	WATER SOAKED WITH GAUZE	94	51.9	
Q8. AWARENESS AND KNOWLEDGE ON METHODS USED FOR DISINFECTION FOR ALGINATE MATERIAL	DON'T KNOW	5	2.8	0.000
	IMMERSION METHOD	76	42.0	
	SPRAY METHOD	46	25.4	
	ULTRASONIC	5	2.8	
	UV CHAMBER	9	5.0	
Q9. AWARENESS AND KNOWLEDGE ON METHOD USED FOR DISINFECTION FOR POLYSULPHIDE IMPRESSION MATERIAL	DON'T KNOW	19	10.5	0.000
	IMMERSION METHOD	55	30.4	
	SPRAY METHOD	53	29.3	
	ULTRASONIC	4	2.2	
	UV CHAMBER	17	9.4	
Q10. AWARENESS AND KNOWLEDGE ON METHOD USED FOR DISINFECTION FOR POLYVINYL SILOXANE IMPRESSION MATERIAL	DON'T KNOW	22	12.2	0.000
	IMMERSION METHOD	61	33.7	
	SPRAY METHOD	33	18.2	
	ULTRASONIC	10	5.5	
	UV CHAMBER	18	9.9	
Q11. AWARENESS AND KNOWLEDGE ON METHOD USED FOR DISINFECTION FOR POLYETHER IMPRESSION MATERIAL	DON'T KNOW	24	13.3	0.000
	IMMERSION METHOD	54	29.8	
	SPRAY METHOD	34	18.8	
	ULTRASONIC	9	5.0	
	UV CHAMBER	23	12.7	
Q12. AWARENESS AND KNOWLEDGE ON METHOD USED FOR DISINFECTION FOR IMPRESSION COMPOUND IMPRESION MATERIAL	DON'T KNOW	15	8.3	0.000
	IMMERSION METHOD	72	39.8	0.000
	SPRAY METHOD	35	19.3	0.000
	SPRAY METHOD, UV CHAMBER	3	1.7	0.000
	ULTRASONIC	11	6.1	0.000
	UV CHAMBER	14	7.7	0.000
	UV CHAMBER, ULTRASONIC	3	1.7	0.000
Q13. AWARENESS AND KNOWLEDGE ON METHOD USED	DON'T KNOW	9	5.0	0.000
	IMMERSION METHOD	56	30.9	



FOR DISINFECTION FOR ZINC OXIDE EUGENOL IMPRESSION MATERIAL	SPRAY METHOD	48	26.5	
	ULTRASONIC	11	6.1	
	UV CHAMBER	25	13.8	
Q14. AWARENESS AND KNOWLEDGE ON TYPE OF DISINFECTANTS USED FOR DISINFECTING ALGINATE	CHLORHEXIDINE	10	5.5	0.000
	DON'T KNOW	12	6.6	
	GLUTERALDEHYD E	27	14.9	
	IODOPHORE	13	7.2	
	ISOPROPHYL ALCOHOL	18	9.9	
	SODIUM HYPOCHLORITE	49	27.1	
Q15. AWARENESS AND KNOWLEDGE ON TYPE OF DISINFECTANTS USED FOR DISINFECTING POLYSULPHIDE	CHLORHEXIDINE	5	2.8	0.000
	DON'T KNOW	21	11.6	
	GLUTERALDEHYD E	38	21.0	
	IODOPHORE	24	13.3	
	ISOPROPHYL ALCOHOL	16	8.8	
	SODIUM HYPOCHLORITE	31	17.1	
Q16. AWARENESS AND KNOWLEDGE ON TYPE OF DISINFECTANTS USED FOR DISINFECTING POLY VINYL SILOXANE	CHLORHEXIDINE	5	2.8	0.000
	DON'T KNOW	25	13.8	
	GLUTERALDEHYD E	29	16.0	
	IODOPHORE	16	8.8	
	ISOPROPHYL ALCOHOL	27	14.9	
	SODIUM HYPOCHLORITE	30	16.6	
Q17. AWARENESS AND KNOWLEDGE ON TYPE OF DISINFECTANTS USED FOR DISINFECTING POLYETHER	CHLORHEXIDINE	8	4.4	0.000
	DON'T KNOW	27	14.9	
	GLUTERALDEHYD E	27	14.9	
	IODOPHORE	25	13.8	
	ISOPROPHYL ALCOHOL	17	9.4	
	SODIUM HYPOCHLORITE	28	15.5	
Q18. AWARENESS AND KNOWLEDGE ON TYPE OF DISINFECTANTS USED FOR DISINFECTING IMPRESSION COMPOUND	CHLORHEXIDINE	12	6.6	0.000
	DON'T KNOW	21	11.6	
	GLUTERALDEHYD E	25	13.8	
	IODOPHORE	19	10.5	
	ISOPROPHYL ALCOHOL	15	8.3	
	SODIUM HYPOCHLORITE	35	19.3	
Q19. AWARENESS	CHLORHEXIDINE	5	2.8	0.000



AND KNOWLEDGE ON TYPE OF DISINFECTANTS USED FOR DISINFECTING ZINC OXIDE EUGENOL	DON'T KNOW	24	13.3
	GLUTERALDEHYDE	37	20.4
	IODOPHORE	26	14.4
	ISOPROPHYL ALCOHOL	14	7.7
	SODIUM HYPOCHLORITE	28	15.5

The significance of the p-values (often <0.05 , many at 0.000) indicates that the variations in responses are not random and require additional investigation. Frequencies and percentages provide a clear view of the predominant practices and the methods adopted by the study population. Some questions demonstrate diverse methods and chemicals used, potentially reflecting variability in practices or lack of standardization.

Questions like wearing gloves during disinfecting the impression, washing the impression with water before disinfection and disinfecting the impression using disinfectants, show a clear majority in responses favouring "Yes," with high percentages (93.4%, 94.5%, and 92.3% respectively) and significant p-values ($p=0.000$). This indicates a statistically significant trend in the study population's behaviour or opinions. In one of the questions where we asked which is the common disinfectant for the impression, the "Spraying" method has the highest frequency (55.8%), followed by "Immersed" (39.2%). This suggests spraying is the most preferred method in this context. The majority (58.0%) selected "5 minutes," indicating that a short disinfection time is most commonly adopted. "Water soaked with gauze" was the dominant choice (51.9%), showing a common preference for this storage method. The "Immersion method" was often selected as a primary method, though combined methods also appear in various combinations (e.g., immersion + spray). Responses in the awareness and knowledge on the methods used for disinfection for alginate material and polysulphide impression material highlight a range of mixed methods being employed, but the "Immersion method" and "Spray method" are most frequent. Sodium hypochlorite consistently appears as a top response (e.g., 27.1% for alginate, 15.5% for polyether). This indicates it is a common

chemical for disinfection. Variations involving combinations of sodium hypochlorite with other chemicals (e.g., glutaraldehyde, iodophore) were also reported but with lesser frequencies. Across some questions (e.g., awareness and knowledge on methods used for disinfection for polyvinyl siloxane impression material, polyether impression material, impression compound), "Don't know" appears as a response, highlighting areas where education or training could be improved.

IV. DISCUSSION:

Dental impressions, which are necessary for all dental operations, are susceptible to cross-infection because they come into direct contact with blood and saliva. The British Dental Association (BDA) asserts that "infection control is a core element of dental practice"¹⁰. If an impression was not disinfected, it could spread germs throughout the lab, enabling them to go from the lab to the various other clinical setting. Only half of the respondents employed the proper handwashing technique, despite the fact that nearly all of them understood how important it was to wash their hands both before and after taking impressions. In addition to washing their hands both before and after creating impressions, the majority of responders were so enthusiastic about following proper washing procedures that they also cleaned impression trays beforehand. According to these findings, the majority of respondents did not know the proper procedure for controlling cross-infection. Water pollution will further disinfect the impression trays; thus, it is best to wash them before producing impressions. After autoclaving, trays should be placed directly into the patient's mouth while wearing gloves. According to American Dental Association rules, an impression should be cleaned of debris, blood, and saliva



before being submitted to a lab. Over 55.8% of dental undergraduates follow "Spraying" method, followed by "Immersed" (39.2%). This suggests spraying is the most preferred method in this context. Nearly half of the participants in our survey were unaware of how to disinfect polyvinyl siloxane impression material, polyether impression material, impression compound. Similar findings were reported in a previous study¹¹, which found that 42% of dental healthcare professionals were aware of the need to use different dilutions of the same product and to disinfect dental impressions. The majority (58.0%) selected "5 minutes," indicating that a short disinfection time is most commonly adopted. "Water soaked with gauze" was the dominant choice (51.9%), showing a common preference for this storage method.

Similar findings were found in another study, where 76% of participants cleaned their impressions with simply tap water⁸. According to a different study that examined the expertise of professors and students at public and private dental schools on the disinfection of impression materials, the majority of professors (66%) and students (81%) disinfected the dental impressions¹². Another study evaluated laboratory directors' knowledge of the disinfection methods and duration of use. They found that 23% of them knew too little about the former, 47% about the latter, and 45% admitted to receiving inadequate training in disinfection techniques¹³. Sodium hypochlorite consistently appears as a top response. This indicates it is a common chemical for disinfection. Variations involving combinations of sodium hypochlorite with other chemicals (e.g., glutaraldehyde, iodophore) were also reported but with lesser frequencies.

Across some questions, "Don't know" appears as a response, highlighting areas where education or training could be improved. Some questions demonstrate diverse methods and chemicals used, potentially reflecting variability in practices or lack of standardization.

According to a study, on the control of cross infections in orthodontic offices,¹⁴ discovered that most departments had policies in place to disinfect chairside surfaces and impressions. The

majority of departments that decontaminated at the chairside notified the laboratory in writing that the impression had been cleaned, while the remaining departments lacked a procedure to guarantee this. The American Dental Association advises using chlorine-based disinfectants, such as sodium hypochlorite solutions (1:10 dilution). Therefore, this study strongly suggests that the curriculum of universities and dental schools should include a section on the necessity to adopt and create knowledge regarding the disinfection of impression materials in dental settings.

V. CONCLUSION:

The following conclusions can be made based on the findings: According to this study's findings, the majority of Chengalpattu dental school undergraduates lack adequate understanding of how to utilise disinfectants, which calls for ongoing educational initiatives in this area. The majority of participants were ignorant of the techniques used to disinfect different types of imprint materials.

Following the survey, the authors came to the conclusion that there is an urgent need to introduce biosecurity ideas in dental schools in Chengalpattu, Tamil Nadu, as cleaning techniques are still not widely used in prosthodontic departments, where the majority of impressions are recorded. This will undoubtedly improve the quality of life for patients, paramedical personnel, and dentists while lowering the likelihood of future issues relating to contaminated impressions.

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