

ORIGINAL RESEARCH

Knowledge, Attitude And Practice Of Current Trends About Dental Prosthesis And Impression Disinfection Method Amongst Dental Laboratories: Perspectives As Per Covid-19 Pandemic

¹Priyanka Kumari, ²TC Devikaa, ³Liyingbeni Lotha, ⁴Rohit Kumar, ⁵Rashi Gupta, ⁶Snigdha Shree

¹Post Graduate Student, Department of Prosthodontics and Crown & Bridge, Rama Dental College Hospital & Research Centre, Kanpur, Uttar Pradesh, India

²Assistant Professor, Department of Prosthodontics and Crown & Bridge, Meenakshi Ammal Dental College and Hospital, Chennai, Tamil Nadu, India

³Post Graduate Student, Department of Prosthodontics and Crown & Bridge, Saraswati Dental College, Lucknow, Uttar Pradesh, India

⁴Post Graduate Student, Department of Conservative Dentistry and Endodontics, Rama Dental College Hospital & Research Centre, Kanpur, Uttar Pradesh, India

⁵Post Graduate Student, Department of Pedodontics, Rama Dental College Hospital & Research Centre, Kanpur, Uttar Pradesh, India

⁶Post Graduate Student, Department of Prosthodontics and Crown & Bridge, Rama Dental College Hospital & Research Centre, Kanpur, Uttar Pradesh, India

Corresponding Author

Priyanka Kumari

Post Graduate Student, Department of Prosthodontics and Crown & Bridge, Rama Dental College Hospital & Research Centre, Kanpur, Uttar Pradesh, India

Email: priyankapam25@gmail.com

Received: 04 December, 2022

Accepted: 17 December, 2022

ABSTRACT

Background & Aim: Impression making is one of the most common procedures that are performed by dentist in day to day practice. These impressions can act as vehicle of transmission and carry various type of microorganism. The aim was to assess the knowledge attitude and practice of current trends about dental prosthesis and impression disinfection method amongst dental laboratories; perspectives as per Covid-19 pandemic.

Materials and Methods: A survey was and the contact details of nearby dental laboratories were obtained from the State Registry of Indian Dental Association. Emails, contact number and postal address were recorded for study purposes. A questionnaire was designed to conduct the survey; it has total eight questions related to disinfection method used in dental laboratories as per COVID-19 perspective. The questions were prepared to include various aspects of disinfection method used by dental laboratories as per COVID-19 protocols. All data was sent for statistical analysis for further analysis and interpretations. P value less than 0.05 was taken as significant.

Statistical Analysis & Results: Statistical analysis was performed by using statistical package for the Social Sciences software. Results showed that out of 85 subjects who filled out the Google form, for the question item, "DO YOU DISINFECT THE DENTAL IMPRESSION?" maximum (67.1%) respondents selected the choice

“YES” followed by the choice “SOMETIMES” as chosen by 28.2%. The significant difference was found in the proportion of various choice selections among the respondents. Out of 85 subjects who filled out the Google form, for the question item, “HOWDO YOU DISINFECT THE DENTAL IMPRESSION?”, maximum (29.4%) respondents selected the choice “WATER THEN SPRAY” followed by the choice “SPRAY AND IMMERSER” and “IMMERSER ONLY” as chosen by 21.2% for both.

Conclusion: Within the limitations of the study, it was concluded that practices and awareness among dental technicians regarding cross-infection control are very less than required, and this seems to increase the risk of transmission of diseases. This survey indicates that knowledge among the personnel participated in the study is less than ideal.

Keywords: Spray, Immerse, Impression, Disinfection, COVID 19, Pandemic, Laboratory

INTRODUCTION

Disinfection is a process that eliminates many or all pathogenic microorganisms except bacterial spores, on inanimate object. One of the major problems which most dental professionals face is cross contamination and cross infection.^{1,2} During the fabrication of dental prosthesis, special care should be taken for every step, especially impression as they are one of the main concerns. This is because impression are one of the most known to be the main source of infection for any potentially infectious material.^{3,4} Prevention of cross-infection between the dental surgery and laboratory is of paramount important to protect patients and staff. COVID-19 is the disease supported by SARS-CoV2 infection, which causes a severe form of the pneumonia.^{5,6} Due to the pathophysiological characteristic of COVID 19 syndrome the particular transmissibility of SARS-CoV2 and the high globalization of our era, the pandemic epidemic emergency spread rapidly all over the world. Disinfection of dental impression should be routine procedure in the dental office and dental laboratory.^{7,8} By knowing all the method and techniques any dental personnel can make a better choice and get good result for impression disinfection. There are various chemical agents which are used to disinfect the impression. These are aldehyde, 2% glutaraldehyde, 10% hypochlorite, betadine, iodophore, 70% alcohol etc. Distrust between dental technician and dentist could result in repeating disinfection procedure of impression by dental technicians even after being disinfected by dentist risking dimensional changes and alterations to the accuracy of the impression material.^{9,10} This study was conducted to assess knowledge attitude and practice of current trends about dental prosthesis and impression disinfection method amongst dental laboratories owing to covid-19 pandemic.

MATERIALS AND METHODS

The study was planned, abstracted and performed in the territory hospital in which surgical. This study was conducted in department of Prosthodontics at Rama Dental College, Hospital and Research Centre. The study protocol was presented to intuitional ethical committee for approval (2020-210/048). Then the study was initiated to achieve the desired goals. A survey was conducted to determine the disinfection technique by dental laboratories in Uttar Pradesh. The contact details of nearby dental laboratories were obtained from the State Registry of Indian Dental Association. Emails, contact number and postal address were recorded for study purposes. A questionnaire was designed to conduct the survey; it has total eight questions related to disinfection method used in dental laboratories as per COVID-19 perspective. The questions were prepared to include various aspects of disinfection method used by dental laboratories as per COVID-19 protocols. These were mode of vaccination, wash of dental impression, vaccination status, disinfection status of impression, method of disinfection, frequency of disinfection of the dental labs. These questionnaires were provided

to 100 dental laboratories by emails. Out of 100 laboratories, 85 of them responded positively. All targeted laboratories were then requested to respond back within the time frame of one month. The information of the survey data obtained by the dental laboratories including their identification was kept confidential. All of the collected data was statistically analyzed by using software SPSS.

Figure 1: Screenshot of survey form sent via email to the dental laboratories for their quick responses

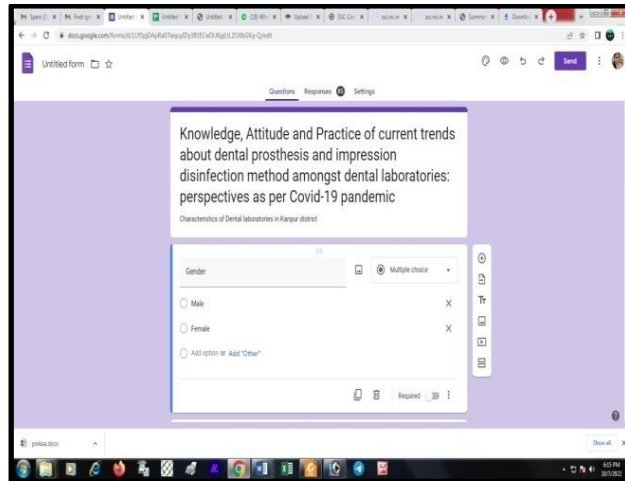


Figure 2: Screenshot of survey form sent via email to the dental laboratories for their quick responses

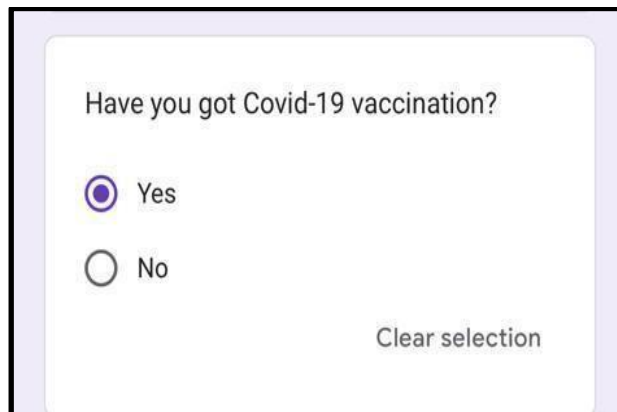


Figure 3: Screenshot of survey form sent via email to the dental laboratories for their quick responses

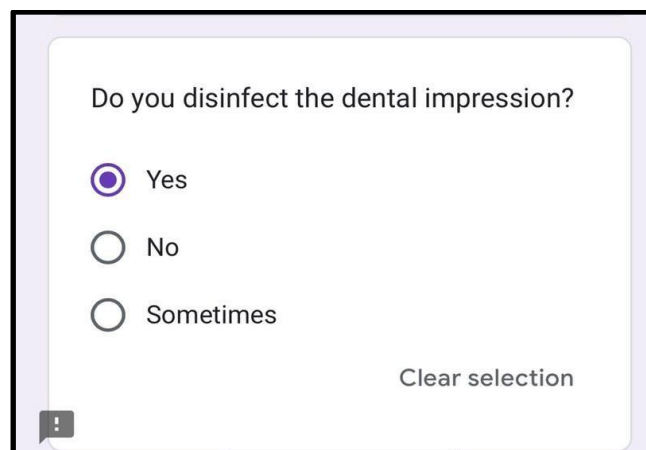


Figure 4: Screenshot of survey form sent via email to the dental laboratories for their quick responses

How do you disinfect the dental impression?

Spray only

Immerse only

Spray and immerse

Water then spray

I don't know

Clear selection

STATISTICAL ANALYSIS AND RESULTS

Out of 85 subjects who filled out the Google form provided, for the question item, “GENDER” maximum 46 (54.1%) were females and rest 39 (45.9%) were males. The significant difference was found in the proportion of gender distribution among the respondents. Out of 85 subjects who filled out the Google form, for the question item, “HAVE YOU GOT COVID -19 VACCINATION?” maximum (97.6%) respondents selected the choice “YES” followed by the choice “NO” as responded by (2.4%) who were not vaccinated for COVID-19. The significant difference is found in the proportion of vaccination status of the distributed subjects. Out of 85 subjects who filled out the Google form, for the question item, “DO YOU WASH THE DENTAL IMPRESSION?”, maximum cases (74.1%) respondents selected the choice “ALWAYS” followed by the choice “SOMETIMES” as chosen by 22.4% . The significant difference was found in the proportion of various choice selections among the respondents. Out of 85 subjects who filled out the Google form, for the question item, “DO YOU DISINFECT THE DENTAL IMPRESSION?”, maximum (67.1%) respondents selected the choice “YES” followed by the choice “SOMETIMES” as chosen by 28.2% . The significant difference was found in the proportion of various choice selections among the respondents. Out of 85 subjects who filled out the Google form, for the question item, “HOW DO YOU DISINFECT THE DENTAL IMPRESSION?”, maximum (29.4%) respondents selected the choice “WATER THEN SPRAY” followed by the choice “SPRAY AND IMMERSER” and “IMMERSE ONLY” as chosen by 21.2% for both. The significant difference was found in the proportion of various choice selections among the respondents. Out of 85 subjects who filled out the Google form, for the question item, “DO YOU DISINFECT THE DENTAL LAB?”, maximum (80%) respondents selected the choice “YES” followed by the choice “MAY BE” as chosen by 12.9%. The significant difference was found in the proportion of various choice selections among the respondents. Out of 85 subjects who filled out the Google form, for the question item, “HOW MANY TIMES DO YOU DISINFECT THE DENTAL LAB?”, maximum (44.7%) respondents selected the choice “ONCE A WEEK ” followed by the choice “DAILY” as chosen by 36.5%. The significant difference was found in the proportion of various choice selections among the respondents. Out of 85 subjects who filled out the Google form, for the question item, “WHAT ARE THE COVID PROTOCOLS DO YOU FOLLOW?”, maximum (51.8%) respondents selected the choice “SANITIZE BEFORE DOING THE LAB WORK ” followed by the choice “MAINTAINING SOCIAL DISTANCING” as chosen by 30.6%. The significant difference was found in the proportion of various choice selections among the respondents.

Table 1: Response of the question according to method of disinfection of the dental impression by the subjects

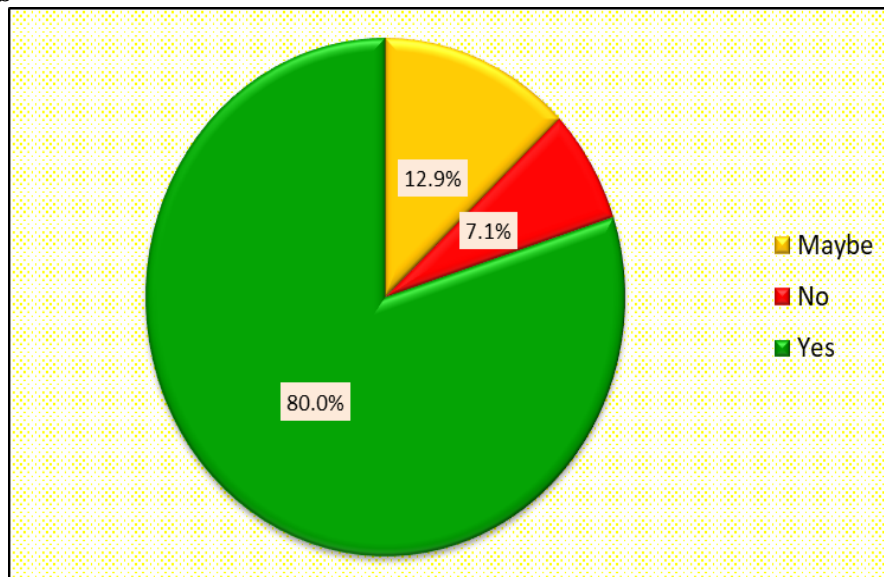
How do you disinfect the dental impression?	No.	%
I don't know	4	4.7
Immerse only	18	21.2
Spray and immerse	18	21.2
Spray only	20	23.5
Water then spray	25	29.4
Total	85	100.0

Table 2: Response of the question according to disinfection of the dental laboratory by the subjects

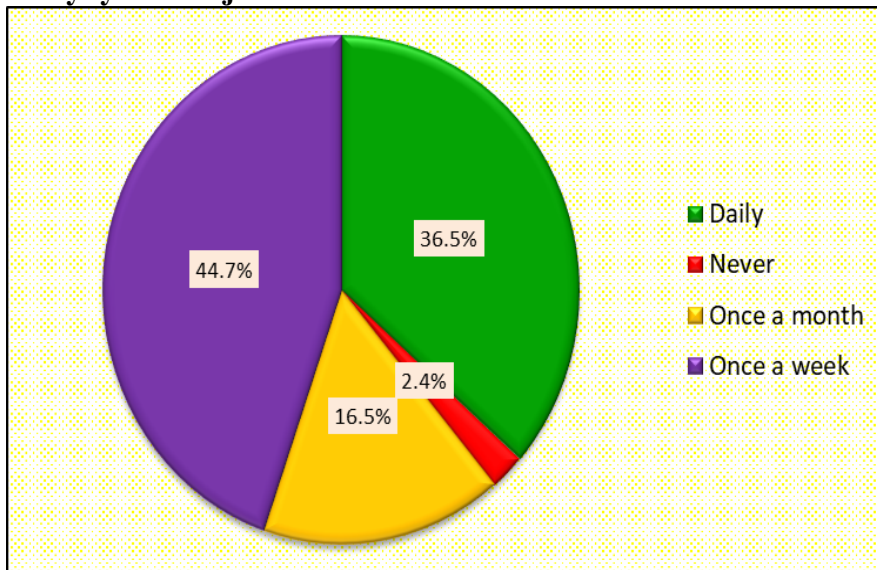
How do you disinfect dental lab?	No.	%
Maybe	11	12.9
No	6	7.1
Yes	68	80.0
Total	85	100.0

Table 3: Response of the question according to the frequency of disinfection of the dental laboratory by the subjects

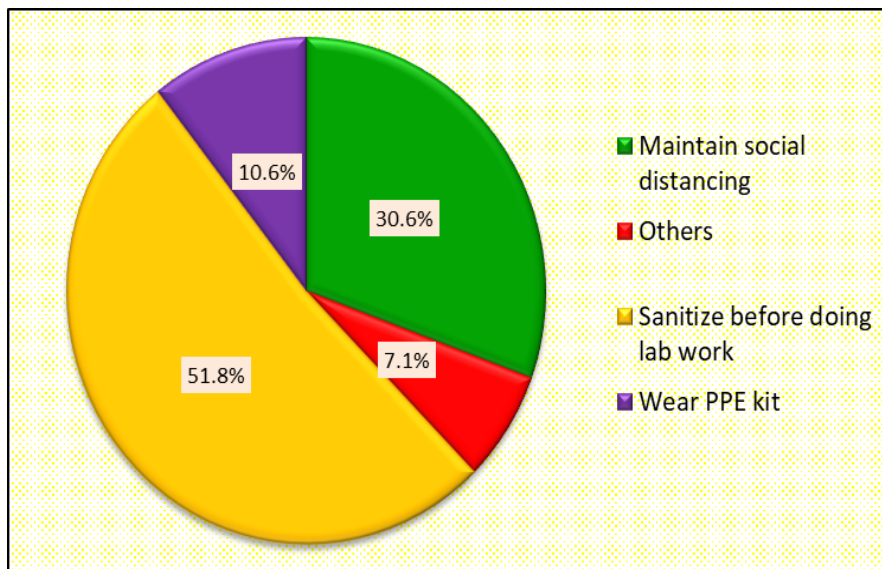
How many times do you disinfect the lab?	No.	%
Daily	31	36.5
Never	2	2.4
Once a month	14	16.5
Once a week	38	44.7
Total	85	100.0

Graph 1: Response of the question according to disinfection of the dental laboratory by the subjects

Graph 2: Response of the question according to the frequency of disinfection of the dental laboratory by the subjects



Graph 3: Response of the question according to the covid protocol followed by the subjects



DISCUSSION

An outbreak of new corona virus-transmitted disease (COVID-19) in China changed the living conditions of the population in several countries and caused widespread public health problems becoming a global health threat. Despite global efforts to contain the spread of the disease, the outbreak is still increasing due to the community’s pattern of spread of this infection.^{11,12} The Covid-19 is present in saliva samples from infected individuals; saliva is therefore a potential source of infection for both professionals and dental patients, given the possible transmission routes involving aerosol, spatter or droplets containing saliva. The COVID-19 is a major emergency worldwide, which should not be underestimated. Due to the rapidly evolving situation, a more thorough assessment of the implications of the Covid-19 outbreak on dental practice is required.^{13,14,15} Since dental professionals are aware of this transmission chain, they should take protective measures and prevent the spread of the disease. Response to questions asked regarding the knowledge of disinfection of dental impression the

awareness was showed by 74.1% participants who always use to wash dental impressions followed by 3.5% who never use to wash dental impressions. Disinfection of impression done mainly by immersion and spray does not exposed the contaminated surface and undercuts to the anti-microbial agent whereas immersion method cover all surfaces but not considered ideal as some impression material absorb water and distort, when they immersed into disinfected material due to their hydrophilic property.^{16,17,18} Hence spray method can be used for disinfect as in contrast to immersion, it limit the amount of distortion and it will take least amount of time for disinfection. A study was conducted to evaluate the effectiveness of spray disinfectant against oral microorganisms on irreversible hydrocollids impression material ie alginate and it was found that 2% gluteraldehyde and 0.5% sodium hypochlorite spray disinfectants can be effectively used for disinfection of alginate impression. In this contrast to other study in which authors stated that alcohol based spray for disinfection of dental impression may be less effective than aldehyde spray and full immersion of impression recommended. Spread disinfection and immersion are two methods of impression disinfections however immersion is more reliable method because all surfaces of impression and tray come in contact with disinfectant solution. But immersion is not method of choice of hydrocolloid material as they are extremely hydrophilic. The result obtained from present study showed that most of the participants 29.4% used water than spray Meta for disinfection of impression followed by spray 23.5% immerse only and spray and immerse 21.2% respectively. Most of the participants did not have sufficient knowledge regarding method of disinfection. Infection control is important in dentistry as well as dental laboratories because patient saliva may be contaminated with oral commensal bacteria.^{19,20,21} During dental procedure it exposes to blood and saliva aerosolis unavoidable direct contact with fluid and contamination with environmental surface, instrument is also potential surface of pathogen transmission. In response to the question regarding of disinfection of dental laboratory 80% respondent used to disinfect dental laboratories. In response to the question regarding frequency of disinfection of dental laboratory 36.5% participants used to disinfect dental laboratories daily while 44.4% used to disinfect dental laboratories once a week. The result of present study was somewhat different from the study conducted by other researchers.

CONCLUSION

Within the limitations of the study, it was concluded that practices and awareness among dental technicians regarding cross-infection control are very less than required, and this seems to increase the risk of transmission of diseases. This survey indicates that knowledge among the personnel participated in the study is less than ideal. The findings of this study show that there is lack of communication between dentists and dental technicians, and that there is need for increasing awareness and establishing educational programs for both groups to decrease the risk of transmission of diseases in dental laboratories. It was also advice to conduct periodic webinar and interactive session for periodic updation of knowledge of covid-19 protection amongst the laboratory personnel.

REFERENCES

1. Shambhu HS, Gujjari AK. A study on the effect on surface detail reproduction of alginate impressions disinfected with sodium hypochlorite and ultraviolet light- An In Vitro study. *J Indian Prosthodont Soc* 2010;10(1):41-47.
2. Correia-Sousa J, Tabaio AM, Silva A, Pereira T, Sampaio-Maia B, Vasconcelos M. The effect of water and sodium hypochlorite disinfection on alginate impressions. *Rev Port Estomatol Med Dent Cir Maxilofac.* 2013; 54(1):8-12
3. Silva SM, Salvador MC. Effect of the disinfection technique on the linear dimensional stability of dental impression materials. *J Appl Oral Sci* 2004;12(3):244-9.

4. Hemalatha, R., & Ganapathy, D. Disinfection of dental impression-A current overview. *Int J Pharm Sci Res*;2016;7(8):661-64.
5. Ismail HA, Asfour H, Shikho SA. A self-disinfecting irreversible hydrocolloid impression material mixed with povidone iodine powder. *Eur J Dent* 2016;10(4):507-511.
6. Kotwal M, Singh VP, Mushtaq H, Ahmed R, Rai G, Kumar A. Disinfection of Impression Materials with Glutaraldehyde, Ultraviolet Radiation, and Autoclave: A Comparative Study. *J Pharm Bioallied Sci* 2021;13(Suppl 1):S289-S292.
7. Ahirwar A, Ramanna PK, Moyin S, Punathil S, Adarsh VJ, Chohan A. Antimicrobial Efficacy of Different Disinfectant Materials on Alginate Impression - A Comparative Study. *Int J Oral Care Res* 2018;6(1):S7-11.
8. Mushtaq MA, Khan MWU. An overview of dental impression disinfection techniques- a literature review. *J Pak Dent Assoc* 2018;27(4):207-12
9. Kumar VR, Viswambaran M, Dua P, Prakash P. A comparative study on the effect of four disinfectant solutions on wettability of three types of elastomeric impression materials with two different immersion time- An in-vitro study. *Ann Prosthodont Restor Dent* 2019;5(4):104-13.
10. Mantena SR. Mohd I, Dev KP, Suresh Sajjan MC, Ramaraju AV, Bheemalingeswara Rao D. Disinfection of Impression Materials: A Comprehensive Review of Disinfection Methods. *Int J Dent Mater* 2019;1(1):07-16.
11. Al Mortadi N, Al-Khatib A, Alzoubi KH, Khabour OF. Disinfection of dental impressions: knowledge and practice among dental technicians. *Clin Cosmet Investig Dent*. 2019;11:103-108.
12. Al-Sayah MH. Chemical disinfectants of COVID-19: an overview. *J Water Health*. 2020;18(5):843-848.
13. Amato A, Caggiano M, Amato M, Moccia G, Capunzo M, De Caro F. Infection Control in Dental Practice During the COVID-19 Pandemic. *Int J Environ Res Public Health* 2020;17(13):4769.
14. Dharshini AD, J Somasundaram, N P Muralidharan. Role of disinfectants on alginate impression materials. *PJAEE* 2020;17(7):397-409.
15. Raeiszadeh M, Adeli B. A Critical Review on Ultraviolet Disinfection Systems against COVID 19 Outbreak: Applicability, Validation, and Safety Considerations. *ACS Photonics* 2020; 7:2941–2951.
16. Selvam SP, Rakshagan V. Day to Day Use of Disinfectant Methods for Different Impression Materials among Dental Practitioners. *JPRI* 2020;32(20):113-124.
17. Al Shikh A, Milosevic A. Effectiveness of Alcohol and Aldehyde Spray Disinfectants on Dental Impressions. *Clin Cosmet Investig Dent*. 2020;12:25-30.
18. Poulos JG, Antonoff LR. Disinfection of impressions. Methods and effects on accuracy. *N Y State Dent J* 1997; 63(6):34-6.
19. Ulgey M, Gorler O, Yesilyurt G. Importance of disinfection time and procedure with different alginate impression products to reduce dimensional instability. *Nigerian Journal of Clinical Practice*. 2020; 23(3):284-290.
20. A J Alhaddad. Accuracy of Impression Material During COVID-19 after Sterilization- In vitro Study. *JPRI* 2021; 33: 241-246.
21. Hardan L, Bourgi R, Cuevas-Suárez CE, Lukomska-Szymanska M, Cornejo-RíosE, Tosco V, Monterubbianesi R, Mancino S, Eid A, Mancino D, Kharouf N, Haikel Y. Disinfection Procedures and Their Effect on the Microorganism Colonization of Dental Impression Materials: A Systematic Review and Meta- Analysis of In Vitro Studies. *Bioengineering (Basel)* 2022; 9(3):123.