

AWARENESS AMONG THE DENTAL PROFESSIONALS ABOUT SAFE DENTAL PRACTICE IN THE CURRENT COVID-19 PANDEMIC.

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Abstract: COVID-19 Pandemic has posed a challenge worldwide especially in the health-care sector in recent times. This has led to the transformational changes in the way dentistry is practiced. The aim of the study is to assess the awareness among the Dental Professionals about safe Dental Practice in the current COVID-19 Pandemic. Online survey was conducted using Google Forms, a 29-item self-designed questionnaire was used for the study. Total 106 responses were received by the stipulated time. The obtained answers were analyzed statistically and compared with the guidelines given by different organizations and other studies. Pandemic has significantly affected the norms of Dental practice, Dental Professionals have inculcated usage of PPE and follow more intricate sterilization precautions for safe dental treatments during the COVID-19 Pandemic.

Index Terms: Corona-Virus Disease, Pandemic, COVID-19, SARS-CoV-2, Dental Professionals, Dental Practice.

I. INTRODUCTION

The current COVID-19 Pandemic situation has affected the whole world, generating global health concerns. Corona-virus disease 2019 (COVID-19) is an infectious disease caused by Severe Acute Respiratory Syndrome Corona-Virus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan, Hubei, China, and since then, it has spread to almost all the countries of the world by January–February 2020 and has resulted in an ongoing pandemic. After a rapid escalation, on January 9, 2020, the World Health Organization declared the discovery a new coronavirus, first called 2019-nCoV and then officially named SARS-CoV-2, which had never been identified in humans before. On February 11, the respiratory disease deriving from SARS-CoV-2 infection was named COVID-19 (coronavirus disease). Common symptoms include fever, cough, fatigue, shortness of breath or breathing difficulties, and loss of smell and taste. The incubation period, which is the time between becoming infected with the virus and showing symptoms, may range from one to fourteen days. While most people have mild symptoms, some people develop Acute Respiratory Distress Syndrome (ARDS) possibly precipitated by cytokine storm, multi-organ failure, septic shock, and blood clots.^[1] The World Health Organization (WHO) declared COVID-19 to be a pandemic on March 11, 2020^[2], and as of 22 October 2020(2:45Pm, CEST), more than 41.1 million cases have been reported across 235 countries, areas or territories with more than 1.1million deaths; more than 28.3 million people have recovered.^[3]

The first case of COVID-19 in India, which originated from China, was reported on 30 January 2020. The central government and state governments had been issuing advisory to the people to maintain social distancing to stop the community spread. However, despite several appeals, the social distancing strategy has not been taken seriously, although this is the only possible solution to stop the spread of COVID-19. In view of this, “lockdown” was declared in the whole country starting from midnight of March 25, 2020, for next 21 days which was further extended later. Other countries in the world have also taken similar or even stricter measures to stop community spread of COVID-19. In Spite of the shutdown of country, COVID-19 cases in India speeded up to reach community spread, currently India has the largest number of confirmed cases in Asia, and has the second-highest number of confirmed cases in the world after the United States^[4], with the number of total confirmed cases breaching the 70,00,000 mark on 10 October 2020. As on 23 October 2020 (10:15am IST), total confirmed cases reached a tally of 77,61,274, with 1,17,347 deceased and 69,47,844 recovered.^[5]

Despite global efforts to contain the disease spread, the outbreak is still on a rise because of the community spread pattern of this infection. This is a zoonotic infection, similar to other coronavirus infections, that is believed to have originated in bats and pangolins and later transmitted to humans. Once in the human body, this coronavirus (SARS-CoV-2) is abundantly present in nasopharyngeal and salivary secretions of affected patients, and its spread is predominantly thought to be respiratory droplet/contact in nature. Dental professionals may encounter patients with suspected or confirmed SARS-CoV-2 infection and will have to act diligently not only to provide care but at the same time prevent nosocomial spread of infection.^[6] Dental professionals appear, indeed, at high risk of contagion due to the exposure to saliva, blood, and aerosol/droplet production during the majority of dental procedures. Given the exposure risk for different working categories, dental practitioners are the workers facing the greatest coronavirus risk. This study

will help us to elucidate with the knowledge dental professionals have to tackle the current pandemic situation, and narrate the possible precautionary measures that can be adopted.

II. AIMS OF THE STUDY

To gauge the awareness amongst Dental Professionals about safe dental practice in the current COVID-19 Pandemic.

III. MATERIALS AND METHOD

Google forms were used to conduct an online survey, the link for the filling of forms was sent through WhatsApp. Anonymity of the responses was maintained at all times, also the questionnaire did not include specifying the respondents' name or other personal details. The link was first spread around at 11:45 IST on 26 August 2020 and kept open for response till 16 September 2020. Reminders were sent around four times during the period of submission of responses. Survey would approximately require 3-4 minutes for completion and submission. The introductory verse of the form stated that this survey is for study purposes, anonymity of the participants will be maintained and participants will have the right not to participate in the survey and participation by submitting the survey will imply providing informed consent.

Inclusion Criteria

1. Any gender.
2. Dental Professionals above 18 years of age.
3. Able to read and interpret the survey.
4. Internet connection and access to WhatsApp.

Exclusion Criteria

Unwilling participants hesitant to provide informed consent for the survey.

IV. INSTRUMENTS USED

SELF-DESIGNED QUESTIONNAIRE: A questionnaire was formed consisting of 29 questions. The questionnaire was designed in a way to know about the guidelines Dental Professionals are following, the self-protection equipment employed and the safety precautions undertaken to provide dental treatment in a shielded and secure environment.

V. ETHICAL CONSIDERATIONS

1. The personal information, views and opinions provided by the participants were kept anonymous.
2. The participation was voluntary, and participants were free to decline participation in the study.
3. If any Dental Professional required further guidance or help regarding more precautionary measures, support would be extended.

VI. STATISTICAL ANALYSIS

Descriptive analysis was computed in terms of mean and standard deviation with range for continuous variables and frequency with percentage for ordinal and nominal variables. All analysis was done with the help of Microsoft Excel. (Version 16.40, Build 16.0.13318.31875) [[Table 1](#)]

VII. RESULT

In the wake of the pandemic, 2/5th out of the Dental Professionals who participated in the survey have restarted their clinics. Around half of the respondents followed guidelines given by Dental Council of India(DCI), 2/3rd amongst them suggest that there is a need for more guidelines for Dental Practice during the pandemic. Majority (81.9%) of the respondents preferred treating patients who had taken an appointment beforehand, most(89.4%) of the participants propounded that the functional zones for safe practice are Green and Orange zones. ([Graph 1](#))

Majority(93.1%) of the respondents have had their employees resuming jobs, out of which 59.4% were hesitant to re-join. More than half, 72.6% suggested compulsory training for employees and 62.3% said that the screening of the employees should be considered mandatory. 80% of the employees had stopped carrying additional accessories to work. Divided responses were obtained for tele-triage. Almost everyone(96.2%) considered both temperature check and using hand sanitizer essential before or immediately after entering the clinic. ([Graph 2](#))

Pulse oximeter is used by 83.5% of the participants to monitor oxygen saturation levels. Most of the participants(90.4%) gauged Personal Protective Equipment(PPE) to be vital for safe Dental practice, which was readily available to 3/4th of the participants. Predominantly all had undergone training for donning and doffing of PPE, 80.2% of them virtually and 5% had attended physical training for the same. 73.4% Dental professionals have incorporated changing rooms in their clinics.([Graph 3](#))

By and large, 87.3% respondents regard N95 masks to be more efficient, 90.5% of them think it should be stored in a clean, breathable container such as a paper bag between uses. Majority of the participants use only N95 masks for non-aerosol generating procedures(57.1%), and a N95 mask covered with surgical masks for aerosol generating procedures(82.1%). 78.9% respondents consider discarding N95 masks after aerosol generating procedures or when they get contaminated with bodily fluids. To increase the shelf-life of N95 masks, almost all think they should be either covered with a surgical mask or a face shield should be worn over it.([Graph 4](#))

Protective gear for non-aerosol generating procedures according to the majority(84.9%) is triple layer surgical mask and protective eyewear/face shield and gloves. While that for aerosol generating procedures is N95 face mask, protective eyewear/face shields and gloves(90.3%). Half of the participants suggest using 0.5% solution of PVP-I solution can reduce the risk of cross-contamination. 88.3% respondents consider Air cleaning systems equipped with HEPA filters and UV light to provide good ventilation and quality air during dental procedures also, 3/4th of them suggest the airflow should be away from the patient. 90.8% participants disinfect the impressions recorded, use new cotton/gauze pieces to disinfect the chair and 3-way syringe, water outlets, handpiece, etc are flushed with disinfectants after every patient.

VIII. DISCUSSION

The index survey has helped us assess the awareness amongst Dental Professionals regarding safe Dental practice with the use of a questionnaire that helps construct analysis by summing up other, simpler, measurements. Initially, a panic situation had emerged for the Dental Professionals amid this COVID-19 Pandemic restrictions. In the current COVID 19 pandemic, Dentists, auxiliaries as well as patients undergoing dental procedures are at high risk of cross-infection. Most dental procedures require close contact with the patient's oral cavity, saliva, blood, and respiratory tract secretions. Saliva is rich in COVID 19 viral load. Many patients who are asymptomatic may be carriers.^[7] For this reason, dentistry today is undergoing structural changes to prevent patients as well as Dental Health Care Professionals(DHCP) from getting infected.

Owing to the COVID-19 situation, 3/5th of the participants have restarted their dental practice tending to the safety norms. Guidelines issued by Dental Council of India(DCI) have been referred to by almost half of the respondents and a dire need for more guidelines is expressed. Pre-appointed patients whose history, problems and procedures are identified to some extent beforehand are considered safe as the uncertainty if any is reduced or handled considerably. Dental clinics in Green and Orange zones can function to provide dental consults for emergency and urgent treatment procedures while in Red zone only emergency treatments should be tended to.

As a consequence of the current COVID-19 Pandemic, employees are hesitant to resume working in the dental clinic as it poses higher chances of being exposed to the virus. According to the majority, the employees should be compulsorily trained to get accustomed to dental practice during COVID-19 Pandemic as more safety precautions should be followed for hand hygiene, social distancing, use of facemask, for them and incoming patients. Mandatory screening for all the Dental Health Care Professionals(DHCP) should be carried out as the majority of the participants suggest, but according to the Guidelines by MoHFW^[2](19/05/2020), Healthcare workers who are asymptomatic and do not fall under the category of being exposed to corona-virus infection are not required to undergo a test before resuming to work in the clinics. Tele-triage is encouraged as it is giving a getaway to safe, appropriate and timely disposition of patient symptoms via phone, by trained, experienced professionals. Hand sanitization(with alcohol-based hand rub/spirit[ABHR] containing 60-90% alcohol content) and Temperature checks to be carried out for every individual entering the clinic. Visual alerts should be displayed at the entrance of the facility and in strategic areas about respiratory hygiene, cough etiquette, social distancing and disposal of contaminated items in trash cans. Also, installing glass or plastic barriers at the reception desk and social distancing maintained in the waiting room.

Oxygen saturation is considered the Fifth Vital Sign in case of COVID-19 affected patients; pulse oximeter helps measure the levels, which is used by 83.5% participants. Personal Protective Equipment(PPE) assures safe performance of dentistry in the current situation, it is considered essential by majority(90.4%) of the participants and to 3/4th of them PPE is easily available despite the immediate increase in demand. Almost all the participants have undergone training for proper Donning and Doffing of PPE, some have taken virtual training(80.2%) while others have taken up training by physically attending the sessions. Changing rooms have been made available for changing into protective gear by 3/4th of the respondents.

N95 masks are most efficient when the filtration and breathability are taken into consideration. Respirator Fit-Test checks the seal between the respirator and face of the wearer and detects any leak that may cause contamination, which should be taken up by all the Health care workers before use of the respirators. In-between patients, as suggested by majority(90.5%) respirators should be placed in a clean, breathable container such as a paper bag. During examination only a triple-layer surgical mask can be used along with protective eyewear/face shield and gloves. Aerosol generating procedures should involve usage of N95 face masks, protective eyewear/face shields and gloves along with PPE. Rubber dams prove to be quintessential as they act as a barrier and can help prevent cross-contamination effectively. The shelf life of a N95 mask can be increased by covering it with a surgical mask or using a face shield. The respirators should be discarded following use during aerosol generating procedures and/or when the respirator gets contaminated with blood, respiratory or nasal secretions or other bodily fluids from the patient. Mouth rinse with 10ml of the 0.5% solution of PVP-I(Povidone Iodine, dilution 1:20 with water) gently moving throughout the oral cavity for 30 seconds and gargling at

the back of the throat for 30 seconds before spitting has been observed to reduce the risk of cross-contamination. High Efficiency Particulate Air(HEPA) filters and UV lights provide optimum filtration and surface disinfection of the dental clinic, 1% Sodium Hypochlorite with a contact time of 10 minutes also provides adequate Environment and surface disinfection in the clinic. Proper ventilation of air should be maintained, in case of high-risk patients negative pressure infection isolation rooms should be used. The air flow should be unidirectional away from the patient, towards the exhaust or an air outlet. Special care should be taken to disinfect the impressions recorded, the 3-way syringe, water outlets, hand piece water pipelines, etc and new cotton/gauze piece should be used to disinfect the chair and all other commonly touched auxiliary parts within 3 Feet diameter.

In spite of the efforts by Dental Council of India(DCI), Indian Dental Association(IDA), Ministry of Health and Family Welfare(MoHFW) and other organizations working for the welfare of people and Health-Care Workers, only 2/3rd out of all the participants feel safe to practice and have restarted their clinics even after 6 months into the COVID-19 pandemic situation. All the dental professionals are practicing while taking into consideration the new and improvised safety rules, although there is a dire need for more guidelines according to 72.6% respondents. Higher transmissibility of the disease and considering the routine dental procedures which usually generate aerosols; during the course of this pandemic, alterations to dental treatments should be considered to maintain a healthy environment for the patients and the dental team. Further precautions are necessary that include careful prescreening of patients and additional measures if treatment of patients with confirmed COVID-19 is deemed necessary.^[6] Due to that lack of a standard, dental care provision has completely stopped or significantly decreased in several affected countries. In addition to increasing the affected populations suffering, this will also incense the burden on hospitals, emergency departments already struggle with the pandemic. This lack of guidelines can also increase the nosocomial COVID-19 spread through dental health care facilities.^[8]

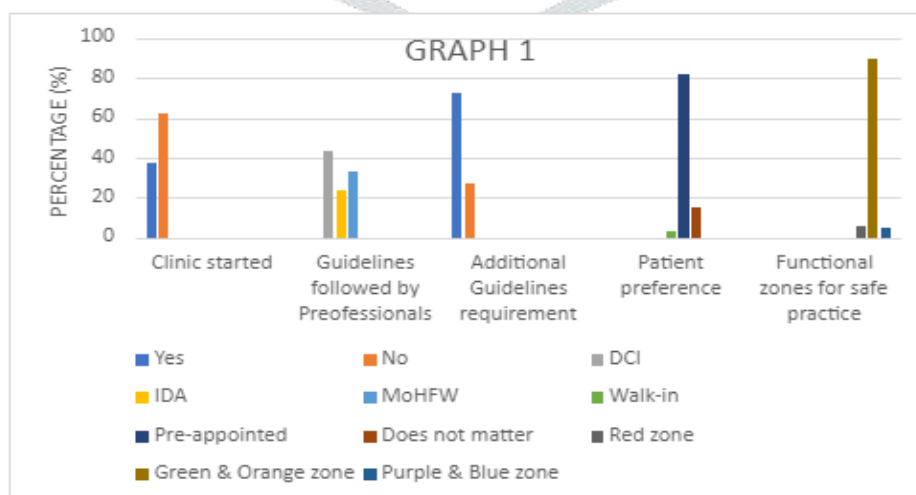
IX. CONCLUSION

COVID-19 Pandemic has posed an extraordinary challenge to the health care sector in recent times. This has led to the transformational ways in which dental procedures are handled, to contain the disease. Adhering to the new norms of practice, Dental Professionals have inculcated usage of PPE, Hand sanitization, social distancing, cough etiquette and periodic disinfection of clinics into the routine. As the cases are increasing exponentially and the disease has reached community spread level more precautions should be taken to avoid nosocomial spread of the disease.

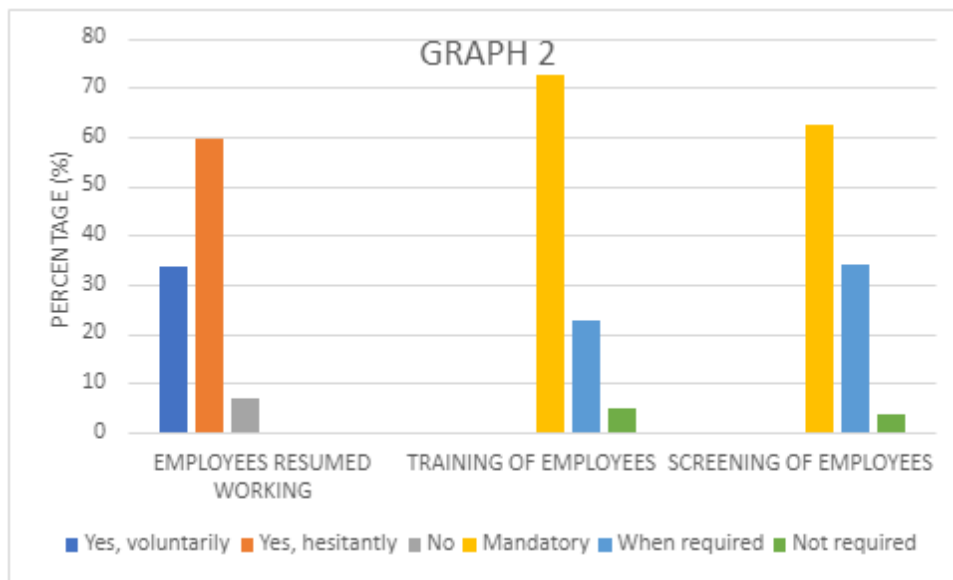
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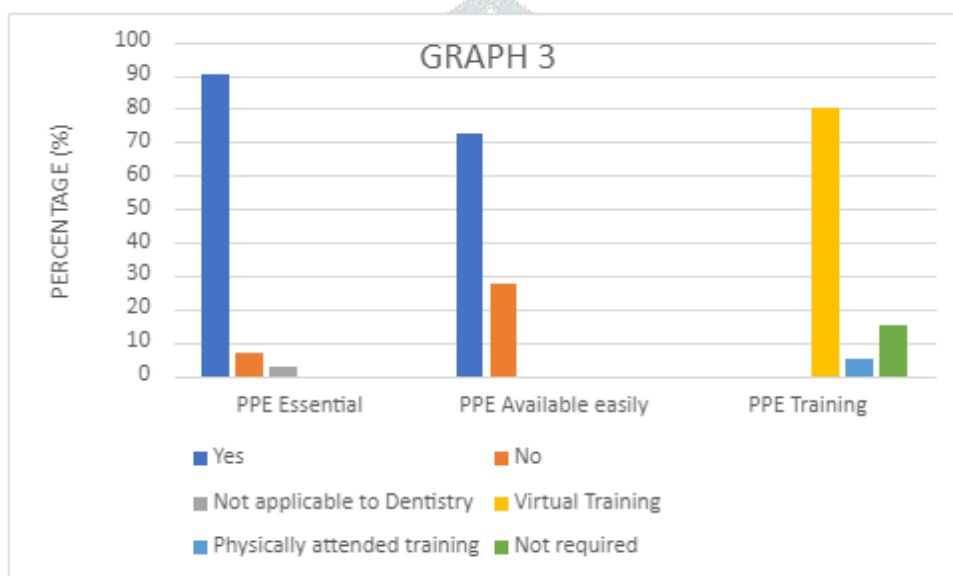
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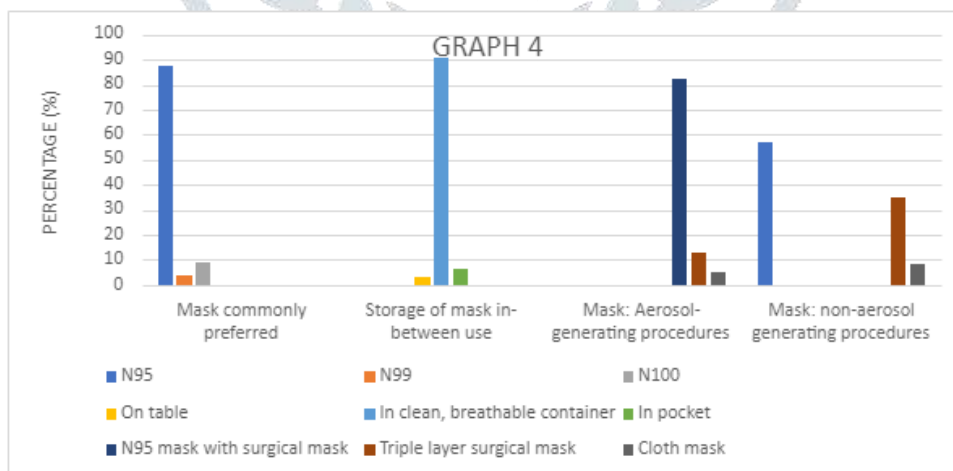
Graph 1



Graph 2



Graph 3



Graph 4

Table 1: Statistical Analysis

VARIABLES	n(%) / Mean+_SD
Clinic reopened	
Yes	40(37.7)
No	66(62.3)

Guidelines Followed	
DCI (Dental Council of India)	45(43.7)
IDA (Indian Dental Association)	24(23.3)
MoHFW (Ministry of Health and Family Welfare)	34(33)
Additional guidelines required	
Yes	77(72.6)
No	29(27.4)
Patient preference	
Walk-in	3(2.9)
Pre-Appointed	86(81.9)
Does not matter	16(15.2)
Functional zones for safe practice	
Red zone	6(5.8)
Green and Orange zone	93(89.4)
Purple and Orange zone	5(4.8)
Employees resumed working	
Voluntarily	34(33.7)
Hesitantly	60(59.4)
No	7(6.9)
Training of employees	
Compulsory training	77(72.6)
Training if required	24(22.6)
No training required	5(4.7)
Screening of employees	
Mandatory	66(62.3)
When symptomatic	36(34)
Not needed	4(3.8)
Usage of Pulse-oximeter	
Yes	86(83.5)
No	17(16.5)
Has staff stopped carrying additional accessories	
Yes	80(80)
No	20(20)
Tele-triage	
Safe, appropriate and timely disposition of patient symptoms via phone, by trained, experienced clinicians.	39(41.5)
Process of determining the priority of patients' treatments by the severity of their condition or likelihood of recovery with and without treatment.	37(39.4)
Not applicable to dentistry	18(19.1)
Procedure to be followed while entering the clinic	
Temperature check	2(1.9)
Hand sanitizer	2(1.9)
All of the above	100(96.2)
Is PPE essential	
Yes	94(90.4)
No	7(6.7)
Not applicable to dentistry.	3(2.9)
Is PPE easily available	
Yes	73(72.3)
No	28(27.7)

Undergoing training for usage of PPE	
Yes, attended physical training.	5(5)
Yes, attended virtual training session.	81(80.2)
Not required.	15(14.9)
Changing room available	
Yes	69(73.4)
No	25(26.6)
Which mask is effective	
N95	89(87.3)
N99	4(3.9)
N100	9(8.8)
True regarding N95 fit-test	
It tests the seal between the N95 mask, or respirators and face of the wearer.	8(8.5)
Should be performed by the wearer each time the mask is put on.	5(5.3)
It is required, so that potentially contaminated air cannot leak into the mask and so hazardous substances are kept out.	7(7.4)
All of the above	74(78.7)
Storage of N95 masks	
On the table	3(3.2)
In a clean, breathable container such as a paper bag between uses	86(90.5)
In your pocket	6(6.3)
Mask used for non-aerosol generating dental procedures	
N95 masks	56(57.1)
Triple layer surgical mask	34(34.7)
Cloth mask	8(8.2)
Mask used for aerosol generating dental procedures	
N95 masks covered with surgical mask	78(82.1)
Triple layer surgical mask	12(12.6)
Cloth mask	5(5.3)
Discarding N95 masks	
Following use during aerosol generating procedures.	7(7.4)
When the mask is contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients.	15(16)
Both	72(76.6)
Increasing shelf-life of N95 mask by	
Covering N95 mask with a surgical mask.	7(7.4)
Using a face shield over an N95 respirator.	13(13.7)
Both	75(78.9)
Protective gear used for Non-aerosol generating procedures	
Triple layer surgical mask and protective eyewear/face shield and gloves.	79(84.9)
Gloves and triple layer surgical mask.	10(10.8)
Triple layer surgical mask only.	4(4.3)
Protective gear used for Aerosol generating procedures	
N95 face mask and Gloves.	6(6.5)
Triple layer surgical mask and Gloves.	3(3.2)
N95 face mask, protective eyewear/face shields and gloves.	84(90.3)
Pre-procedural oral rinse used by patients	
1% Sodium Hypochlorite	36(40)
0.5% solution of PVP-I solution(Povidone iodine)	49(54.4)

Water	5(5.6)
Ventilation and quality air during Dental procedures is provided by	
Air cleaning system equipped with HEPA filter and UV light.	83(88.3)
Use of a ceiling fan.	6(6.4)
Room freshener spray.	5(5.3)
Flow of air used for air quality management	
Unidirectional flow of air towards the patient.	10(10.6)
Unidirectional flow of air away from the patient.	10(10.6)
Direction of airflow doesn't matter.	74(78.7)
True regarding Dental Precautions	
Impressions should be thoroughly disinfected before pouring or sending to the laboratory using an appropriate disinfectant.	5(5.1)
New cotton/ gauze pieces (for every surface) should be used to disinfect the Dental Chair along with all the auxiliary parts within 3 feet of distance.	1(1)
All 3 in 1 syringe, water outlets, hand piece water pipelines, etc. should be flushed with the disinfectant solution for 30-40 seconds.	3(3.1)
All of the above	89(90.8)

