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Original Article

Practitioner's Perspective of Personal Protection against COVID-19 during Prosthodontics Rehabilitation

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ABSTRACT

The corona virus pandemic has impacted almost all kinds of public health care professions, including dentistry. **Objectives:** In the present study, we aimed to evaluate the practitioner's perspective of personal protection against COVID-19 and evaluating the practicing protective protocols adopted by local practitioners. **Methods:** This cross-sectional study included 150 practitioners from two different private dental hospitals. Data was collected by pre-structured questionnaire, which composed of 20 questions. These questions assessed infection control measures and their perspective and knowledge regarding spread of Corona virus. Data were analyzed using (SPSS version 20.0) **Results:** A total of 150 practitioners participated in the study (70 house officers and 80 post graduate residents and above). The most commonly practiced procedure was wearing mask (81.3%) and washing hands (76%) after gloves removal. A small amount of practitioners preferred rinsing mouth with mouth wash (2.7%), use of water-resistant gowns (4.7%), wearing goggles (8%), use of N95 mask and rubber dam application (9.3%) each during procedure. **Conclusion:** Prosthodontists are at highest risk of contracting the virus owing to aerosol generating procedures. Current study observed an inadequate use of PPEs as depicted from various responses from practitioners such as limited use of mouth rinses before start of procedures, goggles, water resistant gowns and N95 masks.

INTRODUCTION

The COVID-19 corona virus has affected all forms of public health care management, and dentistry is not an exception to it. The health care professionals around the globe being on the forefront, has largely been affected by COVID-19 virus. Oral and dental health care providers, including prosthodontists, are most vulnerable to this disease, because of increased viral load and aerosol generating procedures. The emergence of this virus has forced the health care professionals to re-consider the protective and preventive measures to curtail the cross-infection [1, 2]. The required preventive measures must be effective to limit and stop the spread of this highly infectious disease. The various forms of viral spread are aerosols generating procedures like tooth preparation and non-aerosol generating processes like exposure to saliva during impression taking, contact with contaminated acrylic particles from dentures, or from finishing/polishing of different restorations. Indirect contact with dental laboratories and dental technicians may include impression, dental casts, and fixed and removable appliances [3, 4]. Dental practitioners and related dental care providers can reduce or limit the spread of COVID-19 by adapting preventive measures at various levels, for example, at triage filtration clinic (monitoring temperature, and oxygen level), waiting area (seating arrangement at recommended distance), and at dental operational rooms (proper ventilation and use of mouth rinses) along with the utilization of personal protective equipment [5]. The Centre for Disease Control (CDC) has emphasized the use of personal protective equipment (PPEs) as compulsory, not

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only for practitioners but for dental assistants as well [6]. Various forms of PPEs consist of goggles, head cover, face-shields, triple layer surgical mask, surgical gloves, disposable gown, water resistant gowns, and N95 respirator during dental procedures. Filtering facepiece-3 (FFP3) should be used in COVID-19 positive patients and if respirator is not accessible combination of mask and full face shield should be used [7, 8]. Since the reporting of first COVID-19 case, almost 2 and half years ago, a rapid surge in research started around the world in terms of prevention, diagnosis, management, and treatment, among others. Several studies have been conducted on the knowledge and perception of different dental practitioners regarding COVID-19 infection control in prosthodontics care facility centres. According to the study done by Sa Y et al, clinical care was provided for patients with dental emergencies by using enhanced grade 2 and grade 3 personal protective equipment (PPE). Tele-dentistry was used and advised where required to provide care for patients with non-emergency needs [9]. Another study done by Aldhuwayhi S et al, around 78.7% of dentists believe that use of N95 mask can prevent the transmission of COVID-19, 91.5% practitioners conclude that repeated hand washing with soap and sanitizers can help prevent transmission of infection, 77.3% of dentists believed that vaccine would prevent the transmission, 92.13% believed that usage of standard guidelines suggested by health authorities can reduce transmission risk [10]. According to study done by Dwivedi H et al, hand hygiene must be strictly followed before and after all patient contact, contact with potentially infectious material, and donning and doffing PPE. Hand hygiene should include the use of an alcohol-based hand rub containing 60-95 percent alcohol or washing hands for at least 20 seconds with soap and water can reduce the chances of transmission of infection. Application of rubber dam during aerosol-generating procedure can minimize spread of infection [7]. According to a study done by Halawani R et al, [11] wearing a mask was the most widely used method (99.8%) to control the spread of infection. Another study done by Banaee S et al, believed that while treating COVID-19 positive patients N95 (59%) is the best fit rather than surgical masks (16.2%) [2]. To follow and comply with the recommended protective protocols against any disease, it has been found to be variable among the health care providers. This depending upon many factors, for example, cost of the personnel protective equipment (PPEs), accessibility, time consuming procedures to disinfect the operatory, availability of protective equipment, difficult and time consuming donning and doffing, among others. The present study was started with having an objective in mind to assess the perspective and current practicing inclination of practitioners towards the predominant type of protection against COVID-19. Therefore, the rationale of the study was to evaluate the knowledge and perspective of different dental practitioners regarding personal protection against COVID-19 during prosthodontics rehabilitation in local circumstances. This would be of valuable information to dental care professionals in providing proper protection against COVID-19 patients and helps to reduce the spread of infection.

METHODS

This cross-sectional study was conducted in Prosthodontics Department of Peshawar Dental College, from January to March; 2022. The study was carried out after obtaining an ethical approval from institution review board. For the purpose of this study the practitioners working in various prosthodontics departments were divided into two groups based on their experience. The first group included house officers and the second group post graduate residents and above. A total of 150 participants were approached in personal to invite them to participate in the study. These participants were selected from two different private dental teaching hospitals namely; Peshawar Dental College (PDC) and Sardar Begum Dental College (SBDC). A consecutive non-probability sampling technique was used for this study. Data was collected using self-structured questionnaire. The participants were informed about the purpose of the study. The prepared questions or responses were self-explanatory, and were deemed necessary to be explained to the participants. An informed verbal consent was taken from the practitioners before starting and recording the responses on prepared questionnaire, and then only wilful participants were recruited in the study. The questionnaire had two parts. The first part was about practitioners' demographic data and second part related to collection of information regarding practitioners' perspective of personal protection against COVID-19 during prosthodontics rehabilitation during various treatment modalities. The collected data were analysed using Statistical Package for Social Sciences (SPSS version 20.0). Descriptive statistics was computed for both qualitative and quantitative variables. Mean and standard deviation was calculated for quantitative variables like age of practitioners. Qualitative variables like gender, affiliation with institution and qualification were presented as frequency and percentage. Association between study variables and perception queries were analysed via Chi-Square test with a 95% confidence level with $p<0.05$.

RESULTS

A total of 150 practitioners participated in the study from two different teaching hospitals, making a response rate of

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100%. Overall, all practitioners filled the questionnaire and opted for the option of their choice. Out of 150 participants 92 (61.3%) were female and 58 (38.7%) were male practitioners as shown in Table 1. The mean age of the patients in study was 26, with a standard deviation (SD) of 3.5. A total of 83 (55.3%) practitioners were from Peshawar Dental College (PDC) and 67 (44.7%) were from Sardar Begum Dental College (SBDC). A total of 80 (53.3%) were post graduate residents or more while 70 (46.7%) were house officers, as shown in Table 1.

Minimum 19	Maximum 46	Male (n=58)	Female (n=92)	House Officers (n=70)	Postgraduate and above (n=80)
Mean+SD	26+3.5	39%	61%	47%	53%
Affiliation with Institution					
PDC	n=83(55%)		SBDC	n=67(45%)	

Table 1: Statistics for participant's gender, age, qualification, and affiliation with institution. PDC- Peshawar 3 Dental College, SBDC- Sardar Begum Dental College

Table 2 and Table 3 shows practitioner's occupational practices regarding use of PPE compliance during prosthodontic procedures. According to the data collected from different practitioners, 59% practitioners sometimes use face shield during procedure. More than half of participants that is almost 59.3% practitioners never used N-95 mask during procedure. A quite significant number of practitioners (81.3%) always used surgical mask. Almost 49% practitioners were found to be engaged in aerosol generating procedures in prosthodontic departments. Regarding the use of mouth rinse, almost 61% practitioners never asked their patient to rinse with mouthwash or any antiseptic solution, before starting any procedure. Disinfection of impression is necessary, and 39.3% practitioners never disinfected impression before sending to laboratory. Almost one third of practitioners (36%) used the facility of extra-oral suction technology. A total of 51% practitioners sometimes availed functional efficient ventilation facility. Regarding wearing of gloves and gowns, 63% practitioners sometimes used gowns during procedure, 60% never used water resistant gowns during dental procedure, and 55% practitioners responded that they used sometimes double gloves during procedure. Almost half of practitioners (49%) responded that they sometimes used goggles during procedure. Washing hands before and after any dental procedure is necessary and 76% of practitioners responded that they always washed hands after gloves removal. The recorded responses of different variables like use of hand sanitizers, rubber dam application and use of PPEs by assistant respectively were 49%, 51%, and 49%. Astonishingly 57% of practitioners' assistant never used PPEs and 43% practitioners sometimes asked their patients to reproduce on paper COVID-19 test before the start of procedure. Similarly, 42% practitioners sometimes asked verbally about Covid-19 test before the procedure and 40% practitioners asked vaccination status from the patients before the procedure.

Variables [n=150 | n (%)]				p-value
Do you use face shield during procedure?	Always16 (10.7)	Sometimes 89 (89.3)	Never 45 (30)	0.15
Are you using N95 mask during procedure?	Always 14 (9.3)	Sometimes 47 (31.3)	Never 89 (59.3)	0.21
Do you use surgical mask?	Always 122 (81.3)	Sometimes 17 (11.3)	Never 11 (7.3)	0.1
How often you are doing aerosol procedures?	Always 74 (49.3)	Sometimes 65 (43.3)	Never 11 (7.3)	0.4
Do you ask patient to rinse mouth with mouthwash?	Always 4 (2.7)	Sometimes 54 (36.0)	Never 92 (61.3)	0.15
How many times you disinfect impression before sending to laboratory?	Always 45 (30.0)	Sometimes 46 (30.7)	Never 59 (39.3)	0.001
Do you use the facility of using extra-oral suction technology?	Always 54 (36.0)	Sometimes 47 (31.3)	Never 49 (32.7)	0.8
Do you avail functional efficient ventilation facility in your environment?	Always 30 (20.0)	Sometimes 76 (50.7)	Never 44 (29.3)	0.38
How much often you are using gown using during dental procedure?	Always 29 (19.3)	Sometimes 95 (63.3)	Never 26 (17.3)	0.11
How much often you are using water resistant gown during procedure?	Always 7 (4.7)	Sometimes 53 (35.3)	Never 90 (60.0)	0.08

Table 2: Practitioner's responses regarding use of PPE of first ten questions (1-10) given in questionnaire.

Variables [n=150 | n (%)]				p-value
Do you wear double gloves during procedure?	Always 25(16.7)	Sometimes 83 (55.3)	Never 42 (28)	0.02
Do you wear goggle during procedure?	Always 12 (8.0)	Sometimes 74 (49.3)	Never 64 (42.7)	0.89
How frequently do you wash hands after gloves removal?	Always 114 (76.0)	Sometimes 33 (22.0)	Never 3 (2.0)	0.05
Do you use hand sanitizer after gloves removal?	Always 73 (48.7)	Sometimes 67 (44.7)	Never 10 (6.6)	0.005
Do you wash hands with soap after each procedure?	Always 77 (51.3)	Sometimes 62 (41.3)	Never 11 (7.3)	0.41
Do you use rubber dam during procedure?	Always 14 (9.3)	Sometimes 62 (41.3)	Never 74 (49.3)	0
Does your assistant use PPE?	Always 13 (8.7)	Sometimes 52 (34.7)	Never 85 (56.7)	0.37
Do you ask for on paper COVID-19 test before the procedure?	Always 38 (25.3)	Sometimes 54 (42.7)	Never 48 (32.0)	0.68
Do you ask verbally about COVID-19 test before the procedure?	Always 61 (40.7)	Sometimes 63 (42.0)	Never 26 (17.3)	0.13
Do you ask about vaccination status from the patients?	Always 58 (38.7)	Sometimes 60 (40.0)	Never 31 (20.7)	0.19

Table 3: Practitioner's responses regarding use of PPE of last ten questions (11-20) given in questionnaire.

DISCUSSION

The present study was carried out among the participants (having basic qualification of BDS, post graduate training and above) working in prosthodontics department of two different teaching hospitals with a sample size of 150 (58

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males and 92 females). This study investigated various parameters of prevailing practicing scenario of practitioners' perspective of protection against COVID-19 during prosthodontic rehabilitation of patients presenting with various forms of replacement therapies. Appropriate type and recommended usage of protective mask is a prime requisite for limiting the spread of COVID-19 and other infectious diseases. However, at times, practitioners fall short of adapting these protective measures due to various reasons, including but not limited to the availability, cost of PPEs, along with donning/doffing time consuming procedures and increase surge of patients. A previous study has observed that only 37% of practitioners working in various hospitals in Pakistan, have access to N95 masks, however in contrast to this, our current study observed 9.3% practitioners using N95 mask during procedure. The greater part of this difference may be due to the low sample size of current study [12]. The low score achieved in our study may be due to shortage of N95 mask for usage or it might be due to its high cost when compared to routinely use surgical masks. In our study 81.3% of practitioners used surgical mask, which are also available over the counters these days, to prevent transmission of infection which are in agreement with a study done by Cagetti and co-workers from Italy who reported a score of 74.5% with a surgical mask [13]. To prevent spread of infection, disinfection of contaminated instruments and materials is obligatory to protect clinical and laboratory personnel. Our study observed a statistically significant deference (p=0.001) for disinfecting impressions. It was noted in our current study that around 30% of practitioners disinfect impression before sending to laboratory as compared to a study done in India and Saudi Arabia earlier where they observed that 14 to 17% dentists disinfect impression before sending to laboratory [14, 15]. A slight high scores obtained in our study might be due to the corona virus pandemic situations, where people are more aware and believe more in disinfection and using sanitizers. It is worth commendable that practitioners had adequate knowledge about the importance of disinfection and its role in reducing the spread of infection. Application of rubber dam during aerosol generating procedure can minimize the spread of infection. Ramsha et al, reported in their study that 28% were using rubber dam during procedure [16], while another study observed that about 13.84% of participants were using rubber dam according to the study done by Duruk G et al [17]. A low score of 9% achieved in current study might be due to the practitioners could find it difficult and time-consuming using rubber dam on every patient or it may be due to unavailability of rubber dam in hospitals or it may be due lack of practitioners' skills. This might be investigated in another study of such a kind. In prosthodontics aerosol generating procedures are unavoidable like tooth preparation in crown/fixed partial dentures and for removable partial dentures. Our study observed that more than 80% of practitioners were doing most of the time aerosol generating procedures in their clinical practices. This is quite interesting that despite COVID-19 pandemic, apprehension of practitioners by avoiding aerosol generating procedures around the globe is quite is high. According to study done by Ramsha K et al, 68% of dentists were avoiding aerosol generating procedures [16]. It suggests that practitioners and their clinical environment are more prone to be affected by the spread of viral load during aerosol generating procedures. There is an abundance of research evidence that mouth rinse with an antiseptic solution can reduce the number of oral micro-organisms [18]. Ahmad and co-workers reported that 24% of practitioners were advising their patients for a pre-procedural mouth rinse [19]. Contrary to this our study observed a quite low score (2.7%) for using a mouth rinse before starting any aerosol generating procedure. This situation is quite startling and measures should be taken to encourage dental practitioners to comply with the recommendations of health care guidelines. A possible explanation for this might be the unawareness or lack of interest on behalf of practitioners regarding use of mouth rinses. Duruk and co-workers reported that 63.79% practitioners were using high volume suction during procedure [17]. It is noted in our current study that around 36% were using high volume suction. Low percentage may be due unavailability of suction system in dental unit or it may be due to patient experienced fear, frustration during suctioning. Trauma to airway or other oral soft tissues might another reason of not using suction during procedure. Protective equipment in the form of goggles, gowns and gloves is essential for every aerosol generating procedures. A study conducted earlier by Narjees et al, reported that 39.4% dentists used goggles during aerosol generating procedures [20]. The present study observed that almost 8% of practitioners used goggles while doing dental procedures. Low score obtained may be due the practitioners are unaware of the substantial risk of viral transmission by aerosol. According to study done by Narjees A et al, around 14.2% used gowns during procedure and these finding are somewhat in agreement with our current study i.e., 19.3%. After gloves, it is the second most often used item of PPE. They're used to keep practitioners and patients safe from microorganisms and bodily fluids [20].

CONCLUSION

Within the limitation of this study, it can be concluded that prosthodontists are most vulnerable to this disease,

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because of abundance of virus in oral secretions. By following the guidelines suggested by the centre for disease control in the form of using of PPE, we can substantially minimize the spread of infection includes masks, goggles, gowns, face-shields and gloves etc. It was observed that PPEs used by practitioners were inadequate especially regarding the use N95 masks, aerosol generating pre-procedural mouth wash rinse, use of rubber dam and etc. The use of PPE during procedure was minimal. The most commonly practiced procedure was wearing mask and washing hands after gloves removal other than that their response towards the use of other equipment's were found to be not up to the required standard to achieve protection against the spread of this deadly disease.

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