DOI: https://doi.org/10.53350/pjmhs2023172580

ORIGINAL ARTICLE

Cross Infection Control Awareness During 5th Wave of Covid 19 Pandemic, Omicron Variant Amongst the Dental Health Care Professionals of Government Sector University in Karachi, Pakistan

HINA SHAH[1], SADAF TALHA[2], SYED MOHSIN AHMED RIZVI[3], MARIUM IRSHAD[4], NAZISH NISAR[4], ARUBA FATIMA[4]
[1]*BDS, MDS, CHPE, Assistant Professor, Community and Preventive Dentistry, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi*
[2]*BDS, FCPS, Assistant Professor, Liaquat College of Medicine and Dentistry, Karachi*
[3]*BDS, CHPE, Lecturer Oral Pathology, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi*
[4]*BDS Student, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University Karachi*
Corresponding author: Hina Shah, Email: shahhina052@gmail.com

ABSTRACT

Objective: The objective of this study is to evaluate the awareness of cross-infection control measures followed by DHCPs during the 5th wave of Covid-19 pandemic, Omicron variant in a government sector university of Karachi, Pakistan.

Method: A Cross-sectional study was conducted from June till September 2022 at Sindh Institute of Oral Health Science during the 5th wave of Covid 19 pandemic, Omicron variant. Data was collected from 153 DHCPs from government sector university using a self-administered questionnaire, comprising of 20 closed ended question to assess the awareness and practice of cross infection protocols by DHCPs.

Results: 98.7% of the participants were vaccinated against Covid 19. 96% of the participants used surgical gowns, face shields, and face masks as part of PPE during examining patients and while performing procedure. After treatment 99.3% of participants washed hands with hand wash, soap or used antiseptic solution. 77.1% of participants asked for Covid 19 test report and 68.6% of participants asked for proof of vaccination against covid 19 before treating patients. 96.1% of participants recommended disinfection of dental unit after every patient. 98% of participants changed glove after every patient. 88.2% of the participants said they would carry all elective and emergency procedures.

Conclusion: The results of this study show that DHCPs practicing at government sector university have adequate knowledge regarding prevention of cross infection protocols and their importance to limit spread of infections. But their practice of prevention of cross infection during Covid 19 pandemic is not ideal as percentage of DHCPs requiring proof of vaccination or negative reports for Covid 19 were rather low and the percentage of DHCPs willing to carry elective procedures along with emergency ones was rather high.

Keywords: Covid 19 pandemic, Omicron virus, cross infection control protocols, omicron

INTRODUCTION

The first case of COVID-19 (SARS-CoV-2 i.e., Severe Acute Respiratory Syndrome Coronavirus emerged in Wuhan, China during the end of the year 2019 and spread quickly to other countries [1]. The outbreak was declared a Public Health Emergency of International Concern (PHEIC) by WHO on 30 January 2020, and the pandemic was announced on 11 March 2020 [2]. The mode of transmission of the disease was found to be via the spread of respiratory droplets or aerosols [3]. Thus, the preventive measures that became obligatory included washing hands with soap, covering the mouth and nose, and maintaining a 1-meter distance from other people [4]. With no effective treatment and vaccine against SARS-CoV-2, public health measures and non-pharmaceutical interventions became necessary to decrease the spread of infection and mortality rate [5]. These measures and interventions included travel restrictions, quarantine of travellers arriving from affected countries, city lockdown, restrictions of mass gathering, isolation and quarantine of confirmed cases and close contacts, social distancing measures, compulsory mask wearing, contact tracing and testing and school closures [5].

The first preventative vaccination against the coronavirus was administered in December 2020 which was followed by the acceptance and administration of multiple other vaccine candidates globally [6]. The mass vaccination programs worldwide reduced the cases of covid infections and eventually the lockdowns were lifted. However, this was not the end of the menace. Multiple waves of SARS-CoV-2 variants have emerged since the first outbreak. In late 2020, the alpha (B.1.1.7), beta (B.1.351), and gamma (P.1) variants emerged in different parts of the world [7]. These variants were then replaced globally by the delta (B.1.617.2) variant, which emerged in 2021 [7]. In late 2021 and early and mid 2022, the highly transmissible omicron (B.1.1.529) variant emerged and became the most prevalent variant globally [7]. Unlike delta variant that had 4 mutations, omicron variant has more than 50 mutations, which result in substantial escape from neutralizing antibody responses meaning that the efficacy of vaccine is lower for omicron variant compared to delta variant [7, 8].

In the COVID-19 pandemic healthcare professionals (HCP) were found to be at high risk of transmission due to their direct contact with patients infected with COVID-19 [9]. Dental healthcare professionals (DHCP) were no exception. The field of dentistry essentially depends upon direct face-to-face contact between patients and DHCPs, and the possible exposure to saliva and blood makes it much more likely for the viral cross infection to occur [10]. Thus, both patients and DHCPs remain at a bilateral risk of getting exposed to Covid 19 that could be transmitted through the oral cavity and respiratory tract during dental visits [11]. The Omicron variant of Covid 19 still exists worldwide including in Pakistan and the possibility of complete eradication of the virus is questionable [12]. To make the situation further concerning in Pakistan specifically, there has been major reluctance towards receiving the vaccine for Covid-19. It was found that during the initial vaccination program only 65% of inhabitants of urban cities of Pakistan were willing to receive vaccines, of which a major section was still not willing to take out time to register for it or visit vaccination centers [13]. An increase in the number of Omicron COVID-19 cases has been observed resulting in the 5th wave of Covid 19 since January 2022 [14].

This explains why it becomes more and more important for HCPs to be up to date with any advancements, changes, and SOPs with concern to covid-19 and its following delta and omicron variants. This study is specifically designed to assess the knowledge and awareness of DHCPs in Pakistan regarding cross-infection control during a time when omicron is prevalent.

The aim of this study is to identify the deficient areas and misconceptions in the knowledge of DHCPs, about precautionary measures against the omicron virus, so that timely guidelines can be given to address those deficiencies and encourage the minimization of infection transmission as much as possible. The objective of this study is to evaluate the awareness of cross-infection control measures followed by DHCPs during the 5th wave of Covid-19 pandemic, Omicron variant in a government sector university of Karachi, Pakistan.

MATERIALS AND METHODOLOGY

A Cross-sectional study about cross infection control awareness during the Covid 19 Omicron pandemic amongst the DHCPs of a government sector OPD in Karachi, Pakistan. The study was carried out from June till September 2022, when Omicron was prevalent in Pakistan. The study was conducted in Dental OPD of Sindh Institute of Oral Health Science at Jinnah Sindh Medical University in Karachi, Pakistan.

Non-probability convenience sampling technique was used for sample size calculation. The sample size calculated was 150 participants with a 95% confidence level.

A Structured questionnaire was designed and used to collect data from the DHCPs of Jinnah Sindh Medical University. The questionnaire comprised of 20 closed-ended questions.

The study population included all the Dental Health Care Professions (DHCPs) that entailed professors, associate professors, assistant professors, lecturers, demonstrators, postgraduates, house officers, hygienists, therapists, prosthetists, technicians, nurses, and assistants. All genders and DHCPs from any religion, caste, creed, and socio-economic background were included in the study. All DHCPs with clinical experience either teaching or non-teaching faculty were also included.

Undergraduate dental, foreign dentists, DHCPs with no clinical experience in either teaching or non-teaching faculty, and DHCPs who did not provide consent or were not willing to be a part of this study were excluded from this study.

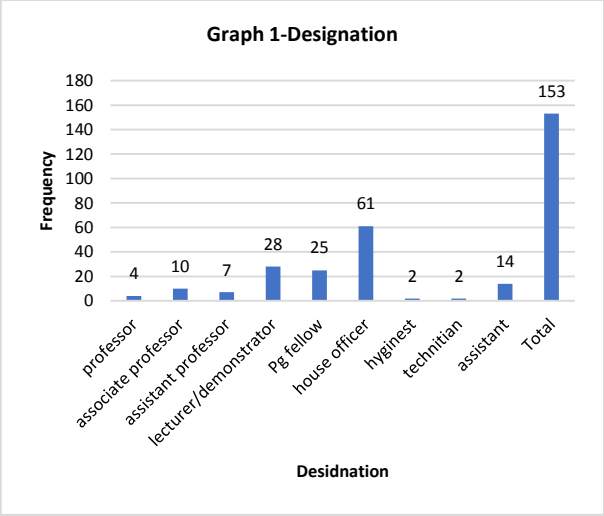
The data was entered and analyzed using SPSS version 26. Descriptive analysis was conducted, and Percentages and frequencies were calculated to quantitatively assess knowledge about the cross-infection control of omicron virus amongst the dental practitioners.

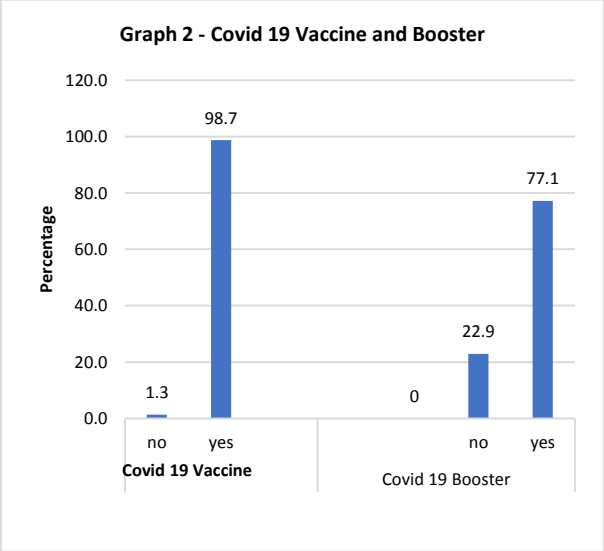
The study was only initiated after ethical approval from the institute. All the individuals who gave their written and verbal consent were included in the study. The participants were assured of the maintenance of their anonymity and their confidentiality was maintained throughout the period of study. No personal identifiers such as full name, address, contact number, etc. were documented or collected. The data was always kept accessible to the principal author and co-author.

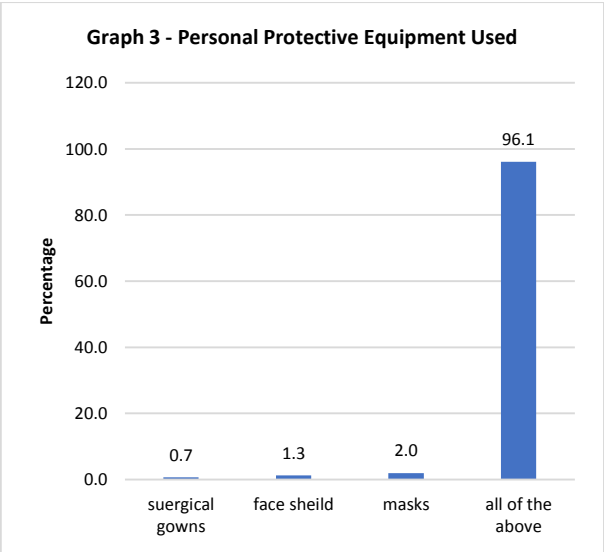
The data was collected from 153 DHCPs and consent was taken from each participant by their acceptance to fill out the form. The form included questions about participant's demographics, Covid 19 vaccination status, Covid 19 booster administration status, personal protective equipment use, hand wash aids used, Covid 19 testing frequency, procedure protocols they followed, and cross-infection control measures they took while working in OPD of public sector hospital during Omicron spread in Pakistan. All the questions had multiple choices for answers and the participants were instructed to choose the best option. All the questionnaires were filled in presence of the investigators in order to eradicate any chance of human-to-human contact.

RESULTS

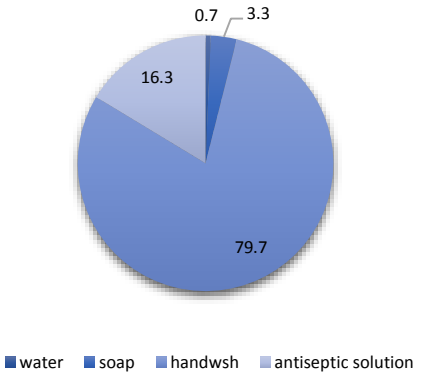
153 DHCPs participated in the study who were asked 20 questions from which 3 were demographics related and 17 were specifically designed to assess knowledge of DHCPs regarding cross infection control during 5th wave of Covid 19 i.e., Omicron virus. The participants included an almost equal number of male (n=76) and female (n=77) DHCPs. The participants included professors (n=4), associate professor (n=10), assistant professors (n=7), lecturers/demonstrators (n=28), PG fellows (n=25), house officers, (n=61), hygienists (n=2), technicians (n=2), and assistants (n=14) (graph 1). 98.7% of the participants were vaccinated against Covid 19 but only 77.1% of them administered the Covid 19 vaccine booster (graph 2). 96% of the participants used surgical gowns, face shields, and face masks as part of PPE during examinations and while performing procedures while 4% only used components of PPE (graph 3).



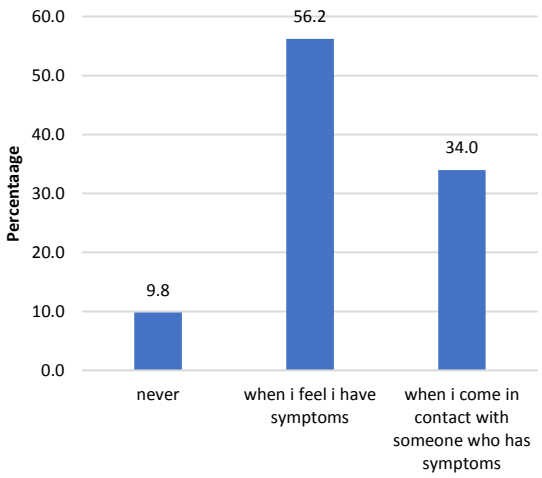




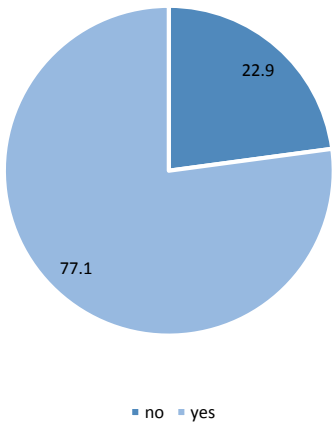
Graph 4 - Aids Used for Wasing Hands After Treatment or Examination (Percentage)



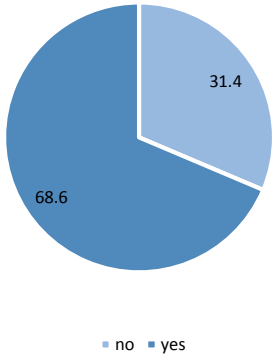
Graph 5 - Frequency of Getting Tested for Covid 19



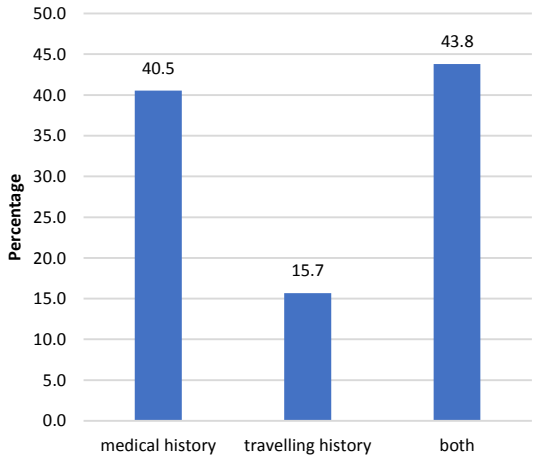
Graph 6 - Requirement of Covid 19 Test Before Treatment (Percentage)



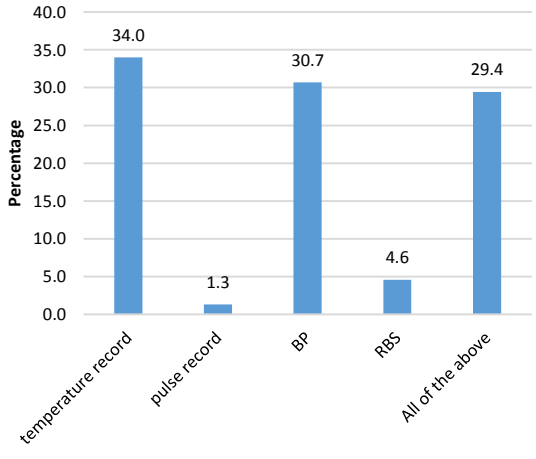
Graph 7 - Requirement of Proof of Vaccine Before Treatment (Percentage)

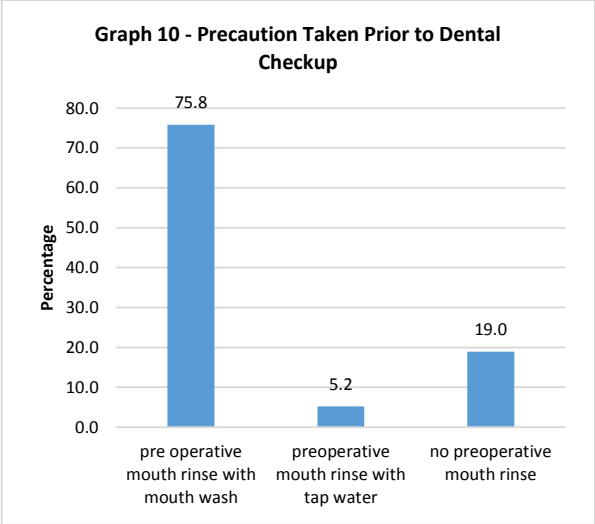


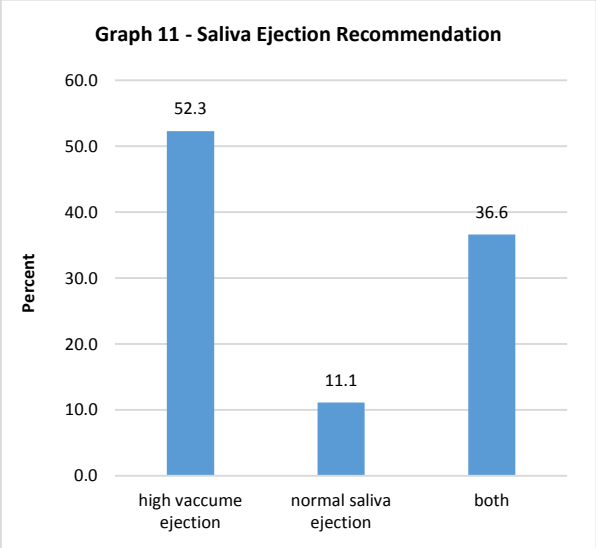
Graph 8 - Mandatory Questions Asked During Screening

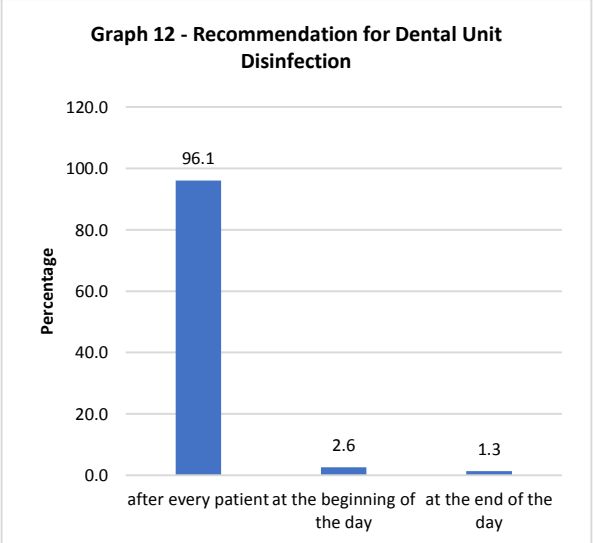


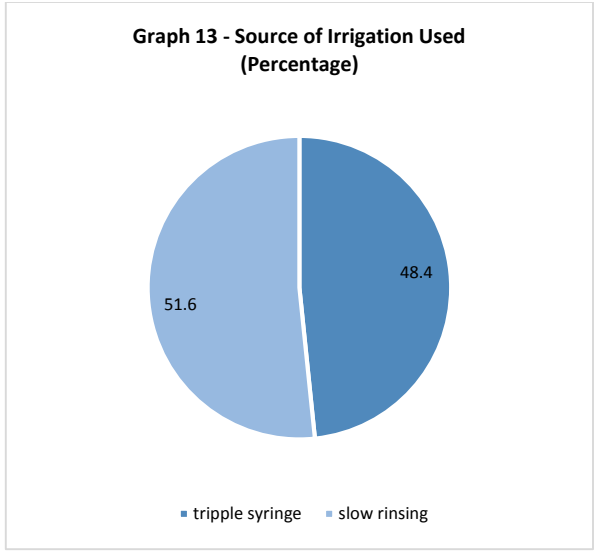
graph 9 - Clinical Steps Performed Before Intraoral Examination?

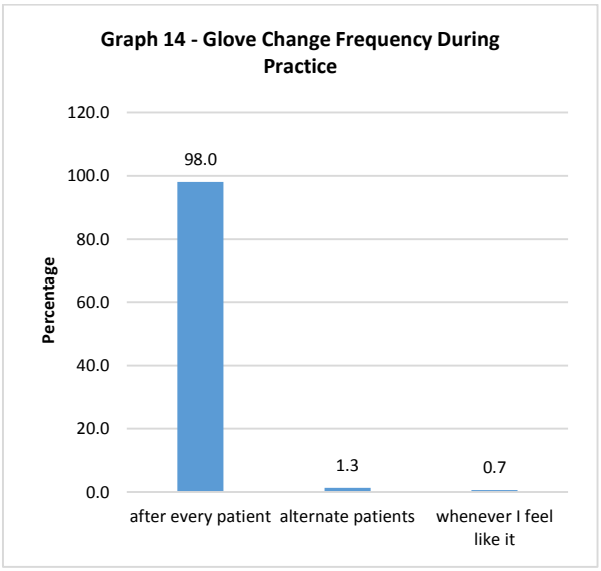


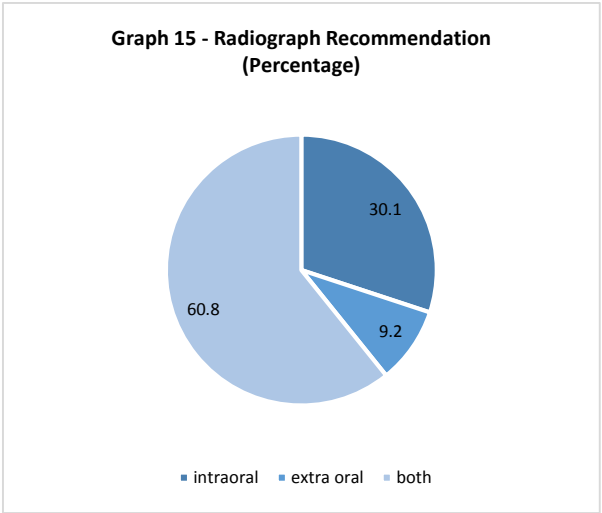

Graph 10 - Precaution Taken Prior to Dental Checkup
Percentage
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
75.8
5.2
19.0
pre operative mouth rinse with mouth wash
preoperative mouth rinse with tap water
no preoperative mouth rinse

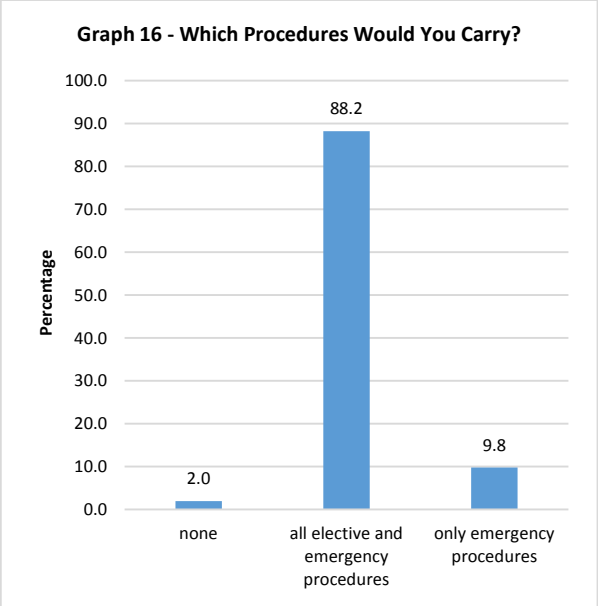

Graph 11 - Saliva Ejection Recommendation
Percent
60.0
50.0
40.0
30.0
20.0
10.0
0.0
52.3
11.1
36.6
high vaccume ejection
normal saliva ejection
both


Graph 12 - Recommendation for Dental Unit Disinfection
Percentage
120.0
100.0
80.0
60.0
40.0
20.0
0.0
96.1
2.6
1.3
after every patient
at the beginning of the day
at the end of the day


Graph 13 - Source of Irrigation Used (Percentage)
48.4
51.6
tripple syringe
slow rinsing


Graph 14 - Glove Change Frequency During Practice
Percentage
120.0
100.0
80.0
60.0
40.0
20.0
0.0
98.0
1.3
0.7
after every patient
alternate patients
whenever I feel like it


Graph 15 - Radiograph Recommendation (Percentage)
30.1
9.2
60.8
intraoral
extra oral
both



After treatment 79.7% of participants washed hands with hand wash, 16.3% used antiseptic solution, 3.3% used soap and 0.7% just used water for cleaning hands (graph 4). 56.2% of participants said that they got tested for covid 19 whenever they felt they had symptoms, 34% got tested when they encountered someone with symptoms and 9.8% participants never got tested (graph 5). 77.1% of participants asked for Covid 19 test reports from their patients before treatment while 22.9% did not (graph 6). 68.6% of participants asked for proof of vaccination against covid 19 before treating patients whereas 31.4% did not (graph 7). 40.5% of the participants asked their patients for medical history, 15.7% asked for traveling history while 43.8% of participants asked for both before proceeding with the treatments (graph 8). 34% of participants checked temperature, 1.3% checked pulse, 30.7% checked blood pressure, 4.6% checked random blood sugar and 29.4% of participants checked all of these before intraoral examination of patients (graph 9). 75.8% of participants required their patients to rinse mouth with mouthwash before starting treatment, 5.2% asked their patients to rinse mouth with tap water and 19% did not require their patient to rinse mouth before treatment (graph 10). 52.3% of participants used high vacuum ejection, 11.1% used normal saliva ejection and 36.6% recommended and used both (graph 11). 96.1% of participants recommended disinfection of dental unit after every patient, 2.6% recommended at the beginning of the day while 1.3% recommended at the end of the day only (graph 12). 51.6% of participants used triple syringe irrigation while 48.4% used slow rinsing as source of irrigation (graph 13). 98% of participants changed glove after every patient, 1.3% after every other patient and 0.7% changed gloves whenever they felt like it (graph 14). 30.1% of participants recommended intraoral radiographs only, 9.2% recommended extraoral radiographs only while 60.8% recommended both (graph 15). 88.2% of the participants said they would carry all elective and emergency procedures, 9.8% said they would carry only emergency procedures while 2% of the participants said they would carry no procedures during covid 19 epidemic (graph 16).

DISCUSSION

Dental care setups have always been source of high risk of spread of diseases such as common cold, hepatitis, herpes, and AIDS due to aerosolization of saliva, blood, pus, plaque, and sulcular fluids of the patient [15]. This conversion of body fluids into bioaerosols is due to the use of high-speed rotary and ultrasonic instruments during provision of dental treatments [15]. Thus, following proper guidelines to eradicate the threat of cross infection to provide a safe environment for patients and DHCPs is essential. The importance of following these guidelines was re-established post Covid 19 Pandemic. The coronavirus, transmitting via aerosols, forced DHCPs all over the world to revisit the infection control protocols. The guidelines to limit spread of Covid 19 spread require DHCPs to maintain hand hygiene, don personal protective equipment, enforce pre-procedural mouth-rinse by patients, use extraoral radiographs only if possible, use rubber dams, use disposable tools, use manual instruments, avoid high-speed handpieces and three-way syringes, and religiously disinfect surfaces [16].

Hands should be washed with alcohol based hand wash or soap and water to kill pathogens. PPE (which includes eye wear, gloves, mask, and gown), is enforced to maintain a barrier between patient and DHCP. Ensure patients' pre operative mouth rinse with chlorhexidine mouthwash to reduce bacterial contamination of bioaerosols. Intraoral radiographs should be avoided and if use is necessary double covers should be used over sensor to avoid cross contamination. Three-way syringes create greater aerosols hence greater chance of transmission thus should be avoided. And equally important is to disinfect all the surfaces in dental setups including seating, reception counters and dental units frequently to get rid of any pathogens.

Despite all these steps being followed, ADA and WHO discouraged any elective procedures to limit crowding and cross infection in the dental setups and treatment of non-vaccinated patients was also limited [16].

Multiple researches have concluded that dentists in Karachi have adequate knowledge of cross infection control protocols [17,18, 19]. However, an aspect to consider here is that while the DHCPs participating in the study showed adequate knowledge and practice of general cross infection prevention protocols, their adaptation of the new mandatory updates in cross infection control, specifically targeted to limit Covid 19 spread was below satisfactory. For example, 88.2% of participants said they would carry all elective and emergency procedures during Omicron pandemic, 22.9% of the participants concurred they did not ask their patients to provide a covid 19 test report before treating them, and 9.8% of participants never got tested for Covid 19. The lack of understanding of the fact that all these three measures were and are essential to limit the spread of covid 19 and the participants' hesitance towards following the WHO guidelines during the international medical emergency is quite concerning. Thus, it becomes pretty obvious that Paksitan government needs to play a better role at educating and enforcing DHCPs in country to follow the strict guidelines set be WHO to limit spread of any diseases in future as the rapidly worsening climate change has brought the world to threat of multiple bacterial, viral, and fungal pandemics and epidemics in near future [20]. In situation like this it becomes more and more important for HCPs to stay up to date with the cross infection control guidelines and more importantly to implement them in their daily practice.

CONCLUSION

The results of this study show that DHCPs practicing at government sector OPD have adequate knowledge regarding prevention of cross infection protocols and their importance to limit spread of infections. But their practice of prevention of cross infection during Covid 19 pandemic is not ideal as percentage of DHCPs requiring proof of vaccination or negative reports for Covid 19 were rather low and the percentage of DHCPs willing to carry elective procedures along with emergency ones was rather high.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Declaration of Conflicting Interests: The Authors declare that there is no conflict of interest.

Disclaimer: The abstract has not been presented or published in a conference, or published in an abstract book or any other relevant information.

REFERENCES

1. Zhang L, Li H, Chen K. Effective risk communication for public health emergencies: reflection on the COVID-19 (2019-nCoV) outbreak in Wuhan, China. InHealthcare 2020 Mar (Vol. 8, No. 1, p. 64). Multidisciplinary Digital Publishing Institute.
2 Khanna RC, Cicinelli MV, Gilbert SS, Honavar SG, Murthy GV. COVID-19 pandemic: Lessons learned and future directions. Indian Journal of Ophthalmology. 2020 May;68(5):703.
3 Lotfi M, Hamblin MR, Rezaei N. COVID-19: Transmission, prevention, and potential therapeutic opportunities. Clinica chimica acta. 2020 Sep 1;508:254-66.
4 Hafeez A, Ahmad S, Siddqui SA, Ahmad M, Mishra S. A review of COVID-19 (Coronavirus Disease-2019) diagnosis, treatments and prevention. EJMO. 2020 Apr;4(2):116-25.
5 Ayouni I, Maatoug J, Dhouib W, Zammit N, Fredj SB, Ghammam R, Ghannem H. Effective public health measures to mitigate the spread of COVID-19: a systematic review. BMC public health. 2021 Dec;21(1):1-4.
6 Asundi A, O'Leary C, Bhadelia N. Global COVID-19 vaccine inequity: The scope, the impact, and the challenges. Cell Host & Microbe. 2021 Jul 14;29(7):1036-9.
7 Barouch DH. Covid-19 Vaccines—Immunity, Variants, Boosters. New England Journal of Medicine. 2022 Sep 15;387(11):1011-20.
8 Accorsi EK, Britton A, Fleming-Dutra KE, Smith ZR, Shang N, Derado G, Miller J, Schrag SJ, Verani JR. Association between 3 doses of mRNA COVID-19 vaccine and symptomatic infection caused by the SARS-CoV-2 Omicron and Delta variants. Jama. 2022 Feb 15;327(7):639-51.
9 Ağalar C, Engin DÖ. Protective measures for COVID-19 for healthcare providers and laboratory personnel. Turkish journal of medical sciences. 2020;50(9):578-84.
10 Derruau S, Bouchet J, Nassif A, Baudet A, Yasukawa K, Lorimier S, Prêcheur I, Bloch-Zupan A, Pellat B, Chardin H, Jung S. COVID-19 and dentistry in 72 questions: an overview of the literature. Journal of Clinical Medicine. 2021 Feb 16;10(4):779.
11 Barabari P, Moharamzadeh K. Novel coronavirus (COVID-19) and dentistry–A comprehensive review of literature. Dentistry journal. 2020 Jun;8(2):53.
12 Wakui N, Kikuchi M, Ebizuka R, Yanagiya T, Togawa C, Matsuoka R, Ikarashi N, Yamamura M, Shirozu S, Machida Y, Suzuki K. Survey of Pharmacists' Knowledge, Attitudes, and Practices (KAP) concerning COVID-19 Infection Control after Being Involved in Vaccine Preparation: A Cross-Sectional Study. International Journal of Environmental Research and Public Health. 2022 Jan;19(15):9035.
13 Khan AA, Abdullah M, Aliani R, Mohiuddin A, Sultan F. COVID-19 vaccine hesitancy and attitudes in Pakistan: A cross-sectional phone survey of major urban cities.
14 Umair M, Ikram A, Rehman Z, Haider SA, Ammar M, Badar N, Ali Q, Rana MS, Salman M. Genomic surveillance of SARS-CoV-2 reveals emergence of Omicron BA. 2 in Islamabad, Pakistan. medRxiv. 2022 Jan 1.
15 Ajantha HB, Kumar MP. Infection control in the dental office-A review. Drug Invention Today. 2018 Aug 1;10(8).
16 Fini MB. What dentists need to know about COVID-19. Oral oncology. 2020 Jun 1;105:104741.
17 Arif Z, Butt SA, Pirvani M, Shaikh AA, Niaz AT, Khan S. Knowledge, attitude and practice regarding infection control procedures among dentists of Karachi. J Adv Med Med Res. 2019 Sep;30:1-7.
18 Feroz Jahangir M, Ali Darvesh S, Kumar K, Nazir S, Sultan J, Naz I. Knowledge Regarding COVID-19 Awareness among Private Dental Practitioners in Karachi.
19 Naveed S, Luxmi S, Ahmed SM, Ali Z, Ali SA. Emergence of COVID-19 infection and Healthcare Workers in Karachi, Pakistan. ANNALS OF ABBASI SHAHEED HOSPITAL AND KARACHI MEDICAL & DENTAL COLLEGE. 2021 Dec 9;26(3):158-65.
20 Yarzábal LA, Salazar LM, Batista-García RA. Climate change, melting cryosphere and frozen pathogens: Should we worry…?. Environmental Sustainability. 2021 Sep;4(3):489-501.
21 Wang C, Han J. Will the COVID-19 pandemic end with the Delta and Omicron variants?. Environmental Chemistry Letters. 2022 Jan 15:1-1.
22 D'Emilio A, Sabounchi SS, Wu Y, Kim A, Franck E, Kane D, Lieberman M. Covid-19 Vaccine Hesitancy and Refusal in Post-Graduate Residents in Dentistry. Journal of Dental Education. 2022 Jan 29.
23 Khalaf ME. Public Knowledge and Attitudes towards Cross Infection and Infection Control in Dentistry during COVID-19 Pandemic. Sch J Dent Sci. 2022 Jan;1:6-13.
24 Amato A, Caggiano M, Amato M, Moccia G, Capunzo M, De Caro F. Infection control in dental practice during the COVID-19 pandemic. International journal of environmental research and public health. 2020 Jan;17(13):4769.
25 Izzetti R, Nisi M, Gabriele M, Graziani F. COVID-19 transmission in dental practice: brief review of preventive measures in Italy. Journal of dental research. 2020 Aug;99(9):1030- 8.
26 Bhumireddy J, Mallineni SK, Nuvvula S. Challenges and possible solutions in dental practice during and post COVID-19. Environmental Science and Pollution Research. 2021 Jan;28(2):1275-7.
27 Dar-Odeh N, Babkair H, Abu-Hammad S, Borzangy S, Abu-Hammad A, Abu-Hammad O. COVID-19: present and future challenges for dental practice. International journal of environmental research and public health. 2020 Jan;17(9):3151.
28 Nimbulkar G, Dubey N, Mandwar S, Dharmapuria S, Reche A, Chhabra KG. Dental practice guidelines in the precariousness of COVID-19: a review. International Journal of Current Research and Review. 2020 Oct;12(19):82-7.