American Journal of Forensic Psychology
ISSN: 0733-1290

https://doi.org/10.61336/AJFP/2026-04-17 https://americanforensicpsychology.org/index.php/ajfp/index

Original Research Article

Knowledge, Attitude, and Practice of Dental Professionals Regarding Cross Infection in the Dental Teaching Hospital of Karachi.

Name of Author:

Dr. Abdul Raheem Qureshi[1]*, Dr. Afreen Bilgrami[2], Dr. Shayan Ahmed[3], Dr. Faiza Hasan[4], Dr. Abdullah[5], Dr. Eraj Nizam[6].

Affiliation:

[1] Lecturer, Department of Dental Materials, Fatima Jinnah Dental College.
[2]Associate, Professor Department of Dental Materials, Fatima Jinnah Dental College.
[3]Lecturer, Department of pediatric dentistry, Altamish Institute of Dental Medicine.
[4]Professor, Department of pharmacology, Fatima Jinnah Dental College.
[5] Senior, Registrar Department of junior oprative, Fatima Jinnah Dental College.
[6] General Dentist, Sir syed college of medical science for girls.

Corresponding Author: Dr. Dr. Abdul Raheem Qureshi.

Received: 14-05-2026
Revised: 20-05-2026
Accepted: 01-06-2026
Published: 09-06-2026

Abstract: ***Background:*** Oral dental care infection management is of primary concern in combating the spread of bloodborne pathologic agents and protecting the patient and provider alike. Although there are set guidelines, the level of adherence to the guidelines on infection control is still low among dental practitioners. The aim of this study was to assess the knowledge, attitudes and practices of dental practitioners in a teaching hospital in Karachi, Pakistan in respect to cross-infection control. ***Methods:*** The study was a cross-sectional study that was carried out in February 2025 in Fatima Jinnah Dental College and Hospital and involved 330 dental professionals including undergraduate students, house officers, post-graduate residents, lecturers, and senior faculty. The information has been obtained with the help of a validated self-administered questionnaire that is filled in via a Google Forms and face-to-face interaction. The questionnaire measured demographic factors, awareness of the infection control measures, views on infection prevention, self-reported practices, perceived obstacles, vaccination, and suggestions on how they can promote the same. ***Findings:*** Most of the respondents were aged 2030 (82.4%), female (59.4%), and house officers (52.1%). The level of knowledge was high as 98.2% were able to identify autoclaving as the most efficient sterilization technique and 88.5% displayed knowledge in sharps disposal. Favourable attitudes were found, with 96.4% of people regarding infection control as very important and 98.2% recognizing the importance of lifelong learning. Adherence was self-reported (sterilization 83.0%, PPE use, 78.8%, hand hygiene, 74.5%, waste disposal, 71.5%, and aerosol management, 50.9%). The vaccination coverage of hepatitis B was 88.5. Among the significant barriers, there were resource shortage (61.8%), time (52.1%), and insufficient training (45.5%). Markedly, although 98.2% agreed with the need to engage in constant learning, 62.4 per cent had not attended any training related to infection control over the last year. Ordinary training workshops (80.6% recommendation) and more rigid adherence of guidelines (73.3% of 72.7%) and greater PPE supplies were highly suggested by participants. ***Conclusion:*** Dental professionals have shown great awareness and favourable attitudes towards infection control; still, there are numerous gaps in the practical application, especially in regards to aerosol management and involvement in continuing education. Systemic obstacles such as resource constraints and institutional hindrances are the major irregularities to ideal infection control. An organizational intervention, better training opportunities, and additional mechanisms to enforce the distance between knowledge and regular practice are necessary to bridge the gap.

Keywords: Control of the infection in dental professionals, measures of cross-infection prevention, sterilization in dentistry, hand hygiene, and personal protective equipment (PPE).

INTRODUCTION

Cross-infection in dental facilities can be regarded as one of the most important spheres of healthcare practice because its effectiveness guarantees patient and dental caregiver safety. Dental operations often imply contamination with blood, saliva, and other body fluids, thus becoming a significant source of the spread of such infectious diseases as hepatitis b, hepatitis C, human immunodeficiency virus (HIV) (1). Placing the burden of duties on dental professionals to practice and follow strict infection control procedures is thus critical in stopping the transmission of infection in the hospital and clinical setting. Although elaborate guidelines and protocols have been established, a significant variation in adhering to infection control practices exists among the providers of dental care and this variation depends on some determinants such as education, training levels and nature of the workplace setting (2,3).

Practices both in dental infection control cover a continuum whereby, hand hygiene, the proper use of personal protective equipment (PPE), instrument sterilization, and the proper disposal of waste comes in as the most important (4). Such interventions are inseparable in the decrease of the threat of cross-contamination and in the safe clinical environment. However, empirical studies show that gaps in the level of knowledge and usage of these measures are still present, especially among dental support employees and few healthcare facilities (1,5). An example is that, although most practitioners in the field of dentistry report the use of gloves and mask regularly, the use of high-volume evacuators and surface cover areas remains at the average level mostly in the academic institutions (1).

The prophylactic value of vaccination, especially in hepatitis B, has been regarded as one of the fundamental elements in infection control measures in the field of dentistry. However, dental practitioner's vaccination has a diverse pattern, where dental support personnel have lower uptake than dentists (1,6). Additionally, the process of sharps and the implementation of measures related to needle-including injuries are the areas of particular interest that require special consideration since the wrong-handling of sharps may trigger extreme occupational exposures (2).

Prevention of infection in dental practice is a key factor that helps to protect both the patient and the healthcare provider, especially in the atmosphere where the risk of contact with bloodborne pathogens and aerosol producing interventions is high. Though there are laid down rules, these rules are not equally followed particularly in resource limited environments. The knowledge levels of dental students in one of the teaching hospitals in Rawalpindi, Pakistan, were assessed in a study by Ahmed et al. (7), which found a significant level of gaps in the understanding and adherence to the standard precautions. The results present the need to consider improved educational and training programs on the matters of infection prevention in the dental curriculum.

Considering the possible consequences of the lack of infection control, there is a strong necessity to evaluate the existing customs among dental specialists critically and evaluate the spheres that could be improved. The current project is expected to assess the experiences of dental professionals with cross-infection in the Dental Teaching Hospital of Karachi, paying specific attention to the idea of their perceptions of infection control responses. Explaining what contributes to the adherence to the infection control measures, the study hopes to contribute to the establishment of specific interventions that would strengthen the safety of both patients and the providers.

METHODOLOGY

In the current cross-sectional study, the findings were conducted at Fatima Jinnah Dental College between November 2025 and March 2026 to review current and future practices at dental professions on cross-infection in dentistry and the consequences of the same to the dental profession.

The population sample was a group of dental practitioners in Karachi, Pakistan, comprising of house officers, postgraduate residents, lecturers and senior faculty.

The sample size was also calculated by using the same methodologies used in the parent study to identify 330 dental participants who were recruited to participate in the study.

The Fatima Jinnah Dental College Institutional Ethical and Scientific Review Board gave its approval to the study with Ethical approval (BEHNO, jan-2026-DM01), the clearance was on 1st January 2026.

The questionnaire was developed healthily through a strict process that lacked reliability as well as validity. Firstly, the items were obtained in accordance with a wide literature search of the available research on cross-infection prevention. A pilot version was then tested on a sample of five subjects consisting of five experts, three dentists and two methodologists, to test the content validity. There were some amendments made to increase the relevancy, comprehensiveness, and clarity.

A pilot study with 10 subjects was conducted to determine the reliability and practicability of the measure.
The last questionnaire was sent out using Google very forms where the respondents were given a short and easy-to-use interface which allowed them to give direct and clear answers. The participants were not in time-boundless and limited to one completion. The tool consisted of six different parts. The former was the

demographic section (age, gender, educational attainment, type of practice). In the second section, the knowledge of the participants was evaluated on the topic of infection control, including questions on the most appropriate method of hand-hygiene in the dental centre.

The third part captured the perceptions on infection control whereby the participants examined different features of cross-infection. Practices related to infection control were evaluated in the fourth part; questions that involved the frequency of using personal protective equipment. The 5 th section was concerned with vaccination status and training. The last part requested participants to suggest how it may be improved. The questionnaire was distributed on a Google Form link to house officers and postgraduates, senior faculty, lecturers and the direct contact with the Karachi senior faculty, lecturers and the personal practitioners.

RESULTS

This study takes a stringent assessment of infection control practices, knowledge, attitudes, barriers, and recommendations in 330 dental professionals. The findings are placed in the framework of the demographic/professional backgrounds of the participators, which is relatively early-career group as described in Table 1.

The majority of the respondents were young professionals aged between 20 and 30 years in age (82.4 %), with the sample being majorly composed of females (59.4 %). In terms of professional qualification, there were slightly more house officers (52.1%), lecturers/demonstrators (23.6%), and senior faculty (20.0%). In line with this early-career profile, 59.4% years of clinical experience, and most (73.9% years of clinical experience) were with private dental institutions. Such a demographic profile suggests that the results are mostly reflective of the perspectives of the professionals who are in their initial years of their professional journey, which explains the necessity of educational interventions specific to them.

Table 1. Demographic and Professional Characteristics of Participants (N=330)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	20 - 30	272	**82.4**
	31 - 40	32	9.7
	41 - 50	22	6.7
	51 and above	4	1.2
Gender	Female	196	**59.4**
	Male	134	40.6
Professional Qualification	House officers	172	**52.1**
	Lecturers/Demonstrators	78	23.6
	Senior faculty	66	20.0
	Postgraduate residents	14	4.2
Years of Experience	Less than 1 year	196	**59.4**
	1–5 years	78	23.6
	More than 10 years	42	12.7
	6–10 years	14	4.2
Type of Practice	Private Dental Institution	244	**73.9**
	Public Dental Institution	86	26.1

Knowledge and Attitudes

The knowledge levels of the infection control among the respondents that remained was excellent. A majority (98.2% - see Table 7) gave the correct answer to the question on autoclaving as the most effective way to sterilize dental instruments and a substantial number (88.5% -see Table 7) demonstrated the adequate knowledge on sharps disposal practices. With regards to hand hygiene, 70.3% were correct in noticing that both soap and water and alcohol-based hand rubs are suggested depending on the clinical scenario.

This good knowledge base was supported by very favourable attitudes (Table 5), with 96.4% of those surveyed ranking infection control as very important in dental practice. Additionally, 98.2% of them acknowledged the importance of the constant dental education in maintaining the level of infection-control (Table 6). There were also high levels of confidence with 83.6% of respondents referring to themselves as being either confident (50.9%) or very confident (32.7%) when it came to their ability to do the right thing in terms of infection-control.

Table 5. Participants' Perceptions and Attitudes Towards Infection Control (N=330)

Question	Response	Frequency (n)	Percentage (%)
How important do you think infection control is in dental practice?	Very important	318	**96.4**
	Important	6	1.8
	Neutral	6	1.8
Do you think that following infection control protocols is time-consuming?	Sometime	154	**46.7**
	No	106	32.1
	Yes	70	21.2
How confident are you in your ability to implement infection control measures effectively?	Confident	168	**50.9**
	Very confident	108	32.7
	Neutral	54	16.4

Table 6. Participants' Engagement with Continuing Education on Infection Control (N=330)

Question	Response	Frequency (n)	Percentage (%)
Do you think continuous dental education plays a role in infection control in dentistry?	Yes	324	**98.2**
	No	6	1.8
Have you attended any training or workshop on infection control in the past year?	No	206	**62.4**
	Yes	124	37.6

Table 7. Knowledge of Infection Control Protocols Among Participants (N=330)

Question	Response	Frequency (n)	Percentage (%)
What is the recommended method for hand hygiene in dental practice?	Both (soap and water & alcohol-based hand rub)	232	**70.3**
	Alcohol-based hand rub	60	18.2
	Soap and water	38	11.5
Which of the following is the most effective method for sterilizing dental instruments?	Autoclaving	324	**98.2**
	Chemical disinfection	4	1.2
	Boiling	2	0.6
How do you dispose of sharps and biomedical waste?	In designated sharps containers	292	**88.5**
	In regular trash bins	38	11.5

Self-Reported Practices and Adherence

In spite of such a solid base of knowledge and positive perceptions, self-reported adherence to particular infection-control measures had a lot of variability (Table 2). The greatest levels of compliance were observed with regard to instrument sterilization with 83.0% of the participants reporting compliance with this required procedure, then personal protection equipment (78.8%), and then hand hygiene (74.5%). Of the total respondents, 71.5% of them stated that they dispose waste properly. However, a major weakness was identified in management of aerosol, where only half of the participants acknowledged their regular compliance with the measures. What it means is that there is a critical knowledge gap particularly with regards to the practices of dentistry that produce aerosols and the potential risk of the spread of any pathogen due to them.

Table 2. Adherence to Standard Infection Control Precautions Among Participants (N=330)

Precaution Measure	Frequency (n)	Percentage (%)
Hand hygiene	246	74.5
Use of personal protective equipment (PPE)	260	78.8
Sterilization of instruments	274	**83.0**
Proper waste disposal	236	71.5
Aerosol management	168	**50.9**

An evaluation of personal protective actions, specifically, the condition of Hepatitis B inoculations, found both strengths and deficiencies (Table 8). Even though 88.5% of the participants stated it was because they are vaccinated, the rest, 11.5%, who were not vaccinated is a significant proportion of vulnerable people hence the need to focus on occupational health interventions.

Table 8. Hepatitis B Vaccination Status Among Participants (N=330)

Question	Response	Frequency (n)	Percentage (%)
Have you been vaccinated against Hepatitis B?	Yes	292	**88.5**
	No	38	11.5

Perceived Barriers and Challenges

The differences between what is known and put into practice might also be partly explained by the barriers outlined in Table 3. The lack of resources including personal protective equipment and sterilization equipment was mentioned as the most prevalent barrier with 61.8% participants mentioning it. This was later followed by time limitations (52.1 %) and training shortcomings (45.5%). All these systemic hindrances highlight institutional and organizational constraints as opposed to personal failures. Notably, patient non-compliance became the least prevalent obstacle (16.4 %) indicating that patient-related issues are not the main factors that hinder the maximization of infection control but rather a result of deficiencies in resources allocation, increased pressure under work, and lack of sufficient continued education.

Table 3. Perceived Barriers and Challenges to Implementing Infection Control Precautions (N=330)

Challenge	Frequency (n)	Percentage (%)
Lack of resources (e.g., PPE, sterilization equipment)	204	**61.8**
Lack of time	172	52.1
Lack of training	150	45.5
Patient non-compliance	54	**16.4**

Engagement with Continuing Education

Some bizarre paradox arising fell under the continuous education (Table 6). Even though virtually all (98.2) % of respondents admitted that they must take continuous education to control the infection, almost two-thirds of the respondents (62.4%) said that they had never attended any training or workshop on infection control within the last one year. The gap between the perceived significance of education and the rates of actual participation is a significant area of inquiry touching on a massive opportunity gap or a lack of opportunity in regard to professional development. This observation is especially significant considering that the sample is made up of early-career professionals, whose early years form one of the most significant milestones towards the creation of safe clinical routines.

Recommendations for Improvement

When solving the given gaps and barriers, the participants supported the following recommendations (Table 4). The most strongly recommended suggestion was the routine training on infection control measures, which was enabled by more than 80 6 percent of the respondents. This was combined with demands to follow sterilization and disinfection instructions more closely (73.3ʿ%), and more personal protective equipment (72.7%). The minority forms were also supported by the majority to promote patient-centred programs of hygiene awareness (62.4 %) and enhanced inspections and audits (58.2 %). On the use of digital record-keeping to minimize cross-contamination (53.9%) and including infection control modules in the dental course (50.9%), about half of the participants supported this outcome. The main lesson learnt in summary of all the recommendations is the need to implement systemic, organization-level interventions, which are supported by stronger educational programs.

Table 4. Participant Recommendations for Improving Infection Control Practices (N=330)

Recommendation	Frequency (n)	Percentage (%)
Regular training workshops on infection control protocols	266	80.6
Strict enforcement of sterilization and disinfection guidelines	242	73.3
Increased availability of personal protective equipment (PPE)	240	72.7
Promoting awareness campaigns for patients about hygiene practices	206	62.4
More frequent inspections and audits of infection control compliance	192	58.2
Implementation of digital record-keeping to reduce cross-contamination	178	53.9
Incorporating infection control modules into the dental curriculum	168	50.9

DISCUSSION

The current research offers an in-depth evaluation of the level of knowledge of infection control, attitudes, practices, perceived barriers, and vaccination practices among dental professionals. The results show that there is a solid theoretical background and an affirmative attitude of professionals but there are gaps in practice.

Comparing to the works published previously, with the two presented studies and other research of interest, one is likely to pinpoint several parallels and context difference.

As presented in Table 1, most of the participants were young professionals, between 20-30 years of age (82.4 %), with 59.4 % having less than one year of experience and 52.1 % of them being house officers. Such this early-career preponderance could be the reason behind the large knowledge levels. Apparently, the same demographic pattern was observed in Qamar et al. (8) where dental students and recent graduates were highly familiar with the concepts and principles of infection control but needed some form of reinforcement in practice.

On knowledge (Table 7), 98.2 percent identified autoclaving as the most efficient method of sterilization, 88.5 percent disposing sharps appropriately and 70.3 percent using proper hand hygiene methods. This is in accordance with Qamar et al. (8) who found dental students in Pakistan to have high theoretical knowledge. Similarly, it was found that good knowledge of the sterilization and PPE guidelines was reported in the study on infection control practices among dental care providers (9) even though variability in practical compliance was reported.

They also support our results as Alharbi et al. (10) found that dental practitioners showed a high level of knowledge but did not show any consistency with regard to obedience to routine practice. In a similar manner, Kamata et al. (11) reported that dental professionals had good knowledge on the precautions associated with infection prevention, but aerosol precautions were not consistently adopted, as can be seen in Table 2, the lowest rate of adherence was shown by aerosol management (50.9%).

Practices self-reported in our study (Table 2) indicated a rather good level of adhering to sterilization (83.0%), PPE (78.8%), and hand hygiene (74.5%), unexplored aerosol management. This gap in knowledge–practice is filled, according to Asif et al. (12), who noted that this gap, under the influence of institutional constraints and workload pressures is the area of practical implementation, regardless of high awareness. On the same note, in CDC-based infections control recommendations, Kohn et al. (13) made the point that compliance relies more on monitoring mechanisms and administrative enforcement as opposed to knowledge per se.

We had a better hand hygiene compliance (74.5 %, Table 2) as compared to the findings reported by Mutters et al. (14) who reported suboptimal adherence to hand hygiene in dental settings. Nevertheless, the countries of our study (50.9 %) had lower levels in the implementation of aerosol precautions (compared to those in the post-COVID-19 environment: Izzetti et al., 15) which might be due to lowered resources and institutional differences.

Vaccination coverage of hepatitis B (Table 8) stood at 88.5 % which is similar to those stated by Singhal et al. (16), although this is slightly lower than almost universal coverage explained in developed healthcare systems (17). The figure of 11.5 % of unvaccinated professionals is alarming and confirms findings by Smith et al. (18) who found that partially complete vaccination was still a current occupational health issue.

Attitudinal results (Table 5) indicated that 96.4 percent found infection control to be very important and 83.6 percent confident or very confident about taking up the measures of infection control. Such positive attitudes may be compared to the results of Baseer et al. (20) who have also made positive professional recognition of the significance of infection control. Nevertheless, according to the observation made by Alharbi et al. (10) high confidence does not always assess to consistent adherence.

It was also determined that a glaring contradiction existed in the continuing education involvement (Table 6). Even though 98.2% agreed that continuous dental education is a critical part of the prevention of infections, only 62.4 -percent had taken any training on infection control within the last one year. This is similar to the results indicated by Al Khatib et al. (19) who indicated high perceived significance of continuing education but low participation levels were as a result of time constraints and insufficient institutional support.

Lack of resources (61.8 %), lack of time (52.1 %) and lack of training among other obstacles had the highest level of perceived impediment in our study (Table 3), whereas lack of non-compliance of patients had least weight (16.4 %). This is in line with the results by Baseer et al. (20) which found out that structural and organizational obstacles are more significant compared to patient related issues in the inhibition of adherence to infection control measures. The need of the institutional intervention is, again, supported by the recommendations of the participants (Table 4), especially the regular workshops (80.6 %) and better the enforcement of sterilization guidelines (73.3 %).

Typically speaking, despite the regional and international literature being slightly varied, there can be observed a general tendency worldwide that is consistent in regard to our findings: high knowledge and positive attitudes co-exist with implementation gaps. Table 2 and Table 6 stand out to illustrate the gap between awareness and action respectively. Thus, the only solution to close this gap is not only the educational reinforcer but also the institutional responsibility, compulsory policies on vaccination, both the organization of resources and frequent audits.

Limitations

The study is based on self-reported data, and thus subject to recall or social desirability bias and most of the participants (82.4% 20-30 and 59.4% less than one-year experience), and thereby the generalisability to more experienced practitioners. Furthermore, most of the participants worked in private dental institutions (73.9 %), and these figures do not necessarily represent the practice in government institutes or other locations. The cross-sectional design gives only a time picture and is unable to make any causal analysis between knowledge, attitude, barriers, and adherence. Lastly, although systemic barriers, including the lack of resources, training, etc, were estimated, the study did not dive into the deep aspects of the issue of institutional policies or administrative aspects of influencing the process of infection control.

CONCLUSION

On the whole, the current study finds that dental professionals possess a strong level of knowledge and the positive attitude to infection control with the majority of the participants identifying the most important procedures, including autoclaving as a method of sterilization, and discarding sharps, as essential to the work of a dental practitioner. However, gaps in practice exist, especially when it comes to aerosol management and vaccination coverage, and the fact that 11.5% of the respondents noted that they have no vaccination against hepatitis B indicates that systemic and institutional factors have a stronger impact than personal ones.

Whereas there is broad consensus that continuing education is essential, the reality of attending training workshops is minimal which reflects a gap between what is apparently known as importance and participation. This research, in turn, highlights the necessity of organisational-level interventions, including the amplified allocation of resources, the rigorous adherence to guidelines, and the expansion of access to education as one of the factors that will allow mitigating the gap between the acquisition of knowledge and the active practice in the field of infection control among dental workers.

REFERENCES

1. Mahasneh AM, Alakhras M, Khabour OF, Al-Labad L, Abu-Hammad O. Knowledge, attitudes and practices of dental health care workers about infection control measures: A cross-sectional study. International Journal of Dental Hygiene. 2020;18(4):389-396.
2. Yadav P, Chaudhary BR, Pokhrel GK, Shrestha M, Ke J, Mandal PK. Knowledge and practice regarding infection control among dentists of a dental college in Bharatpur, Chitwan. Journal of College of Medical Sciences-Nepal. 2017;13(4):388-393.
3. Al-Omari MA, Al-Dwairi ZN. Compliance with infection control programs in private dental clinics in Jordan. Journal of Dental Education. 2005;69(6):693-698.
4. Kazi M, Saxena A. Infection control in dental practice: A review. Journal of Dental and Allied Sciences. 2012;1(2):45-49.
5. Al-Abdal A, Al-Suliman A, Al-Qahtani A, Al-Qahtani M. Infection control practices among dental health care providers in Saudi Arabia. Journal of Infection and Public Health. 2019;12(3):438-442.
6. Di Giuseppe G, Nobile CG, Marinelli P, Angelillo IF. A survey of knowledge, attitudes and behavior of Italian dentists toward immunization. Vaccine. 2007;25(9):1669-1675.
7. Ahmed N, Shakoor A, Rehman A, Khan M. What do the dental students know about infection control? A cross-sectional study. BioMed Research International. 2020;2020:1-7.
8. Qamar MK, Naeem SB, Bukhari IA, Khan SA, Khan MA. What do the dental students know about infection control? A cross-sectional study. BioMed Research International. 2020;2020:1-6.
9. Practices of Infection Control among Dental Care Providers. Clinical, Cosmetic and Investigational Dentistry. 2020;12:389-396.
10. Alharbi G, Shaker A, Alharbi A, Alharbi M. Knowledge and compliance of infection control among dental practitioners. Journal of Infection and Public Health. 2021;14(4):489-494.
11. Kamate SK, Sharma S, Thakar S, Srivastava D, Sengupta K, Hadi AJ, et al. Assessing knowledge, attitudes and practices of dental practitioners regarding COVID-19. Clinical Epidemiology and Global Health. 2020;8(4):1298-1304.
12. Asif M, Khan M, Ahmed N, Sohail M. Infection control practices among dental health care workers. Pakistan Oral & Dental Journal. 2021;41(2):89-93.
13. Kohn WG, Collins AS, Cleveland JL, Harte JA, Eklund KJ, Malvitz DM. Guidelines for infection control in dental health-care settings. MMWR Recommendations and Reports. 2003;52(RR-17):1-61.
14. Mutters NT, Hägele U, Hagenfeld D, Hellwig E, Frank U. Compliance with infection control practices in dentistry. American Journal of Infection Control. 2014;42(10):1078-1080.
15. Izzetti R, Nisi M, Gabriele M, Graziani F. COVID-19 transmission in dental practice: Aerosol management considerations. International Journal of Environmental Research and Public Health. 2020;17(9):3158.
16. Singhal V, Bhola N, Bhola R, Agrawal A. Hepatitis B vaccination status among dental professionals. Journal of Clinical and Diagnostic Research. 2018;12(5):ZC20-ZC23.
17. Cleveland JL, Bonito AJ, Corley TJ, Foster M, Barker L, Gordon Brown G, et al. Hepatitis B

vaccination and infection control in dental settings. Journal of the American Dental Association. 2016;147(7):535-544.
18. Smith AJ, Cameron SO, Bagg J, Kennedy D. Occupational exposure and vaccination coverage in dental healthcare workers. Infection Control & Hospital Epidemiology. 2019;40(4):456-461.
19. Al-Khatib IA, Al-Slaibi T, Abu Hammad O, Dar-Odeh N. Barriers to infection control compliance among dental professionals. Eastern Mediterranean Health Journal. 2020;26(8):936-942.
20. Baseer MA, Rahman G, Yassin MA. Infection control practices in dental settings: A cross-sectional study. Saudi Medical Journal. 2016;37(5):558-564.