

## Dentists Comprehension to Personal Protection Equipment Use Post COVID-19 Pandemic

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### ABSTRACT

**Background:** It has been shown that health care professionals, including dentists, who wear personal protective equipment, reduce the spread of COVID-19, which lowers patient morbidity and mortality as well as illness and absenteeism.

**Aim:** The purpose of the study was to evaluate the impact of dentists' Comprehension of personal infection control and their level of trust in PPE as part of the dental profession's response post COVID-19 pandemic.

**Material and Method:** The sample size was (388) participants distributed as (Specialist, General Dental Practitioners, Dental Branch Practitioners, and Rotators). Google form prepared with specific questions (Demographical, Practice and drawback questions) translated to the mother language (Arabic Language). Structured and distributed online by sharing the link through electronic platforms. Two responses were used in a statistical analysis using the SPSS Package version. Significant p value of 0.05 or less is used. Descriptive statistics were used in the data analysis to analyze the percentage, mean and standard deviation values. All questions employ the spearman test to determine correlations. Kruskal-Wallis H for comparing differences between groups including qualification and experience period between participants.

**Result:** Significant results are shown in both rotators and general practitioners for comparison of different qualification levels between dentists. All dentists are use and practicing well the personal protection equipment.

**Conclusions:** Overall, dentists in the current study are well practice the PPE post COVID-19.

### Keywords

Dentist Perception, COVID 19, Personal Protection Equipment, Analytical Study, Practice Questionnaires.

### Introduction

Two thousand Ninety; was a remarkable year all across the world. The COVID-19 virus, which has claimed many lives, is the deadliest health problem facing humanity [1]. As a result

of the epidemic's onslaught, people at all stages of life faced a variety of challenges (social, economic, health, and political). The government did everything it could to prevent the epidemic from spreading widely [2]. In addition to odor and test loss, COVID-19 infection symptoms include fever, cough, tiredness, anorexia, shortness of breath, and myalgia, all of which have a significant mortality risk [3].

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However, some people experience symptomless attacks, which were recorded in the early COVID-19 investigations at a rate of 1.5–2.8% [4]. Asymptomatic individuals pose a particular risk to dental practitioners since they could unintentionally show up for their appointment while harboring the COVID-19 virus. Dental practitioners are not immune to these challenges since it is believed that saliva is a source of the COVID-19 virus [5]. Due to their close proximity to patients, the dental team is at risk of contracting an illness.

Due to their proximity to the patient's mouth and nose while performing their duties, dental staffs are also more vulnerable [6]. Additionally, the aerosol-generating procedures (AGPs) cause airborne droplets to be released from the patient's mouth into the environment, which is one of the primary ways that COVID-19 is spread [7]. Research into how to safely resume dental care led to the creation of new protocols for use with better personal protection equipment (PPE) [8].

By educating healthcare workers (HCWs) about the illness and the steps required to stop its spread, primarily through the use of personal protective equipment (PPE). One aim of these initiatives was to increase their preparedness [9].

In fact, proper PPE use, such as the use of gloves, dressing gowns, masks, and protective eyewear, can lessen the spread of infections [10]. The use of PPE by HCWs, including dentists, has been shown to reduce the spread of COVID-19, which lowers patient morbidity and mortality as well as illness and absenteeism [11]. Dental professionals might not fully understand the relevance and effectiveness of PPE, and reports of misuse and noncompliance are frequent. New protection protocols are upheld for the performance of safe dental procedures with improved personal protective equipment (PPE) [12].

The new procedures have been successful in lowering the danger of transmission in dental offices [13]. However, some detrimental aspects need to be addressed, such as the physical challenges of wearing greater PPE and the increased anxiety among dentists and dental workers [14]. In addition, there is the time lost during fallow periods as well as the additional time required for donning and donning [15,16]. All of these elements, as well as the higher price of upgraded PPE and mitigation elements, lower the number of patients that may be seen in a day, which lowers earnings [17,18]. Due to the novelty of COVID-19, Iraq, like other nations, initially lacked knowledge and evidence-based recommendations for protection and prevention of transmission. The purpose of this study was to look into the PPE practices of dentists as well as the negative effects of utilizing PPE in dental work at the epidemic and post it.

### **Aim**

The purpose of the study was to evaluate the impact of dentists' comprehension of personal infection control and their level of trust in PPE as part of the dental profession's response post COVID-19

pandemic. The null hypothesis, according to the authors, is that dentists' comprehension and practice PPE use post COVID-19 are identical, with no differences. There are also differences in how much dentists know about COVID-19 based on their professional position and work history.

### **Material and Method**

A cross sectional study was conducted between Augusts to November 2022 among Dentists working in Nineveh Health Directorate in Nineveh Province. Approval to conduct this study was obtained from the Institutional Review of the Authorized Scientific Committee in Nineveh Health Directorate with the numbered session 235 in 31/ 8 / 2022 with research number 2022142 (no. 31447, date 5 / 9 / 2022).

The participants were given a thorough explanation of the research's objectives and methodology. As a result, decisions about sharing or not were made based on preferences rather than requirements. For this, a fake written consent form was created. Dentists are the study's sample, regardless of whether they are employed by Nineveh's public hospitals, health facilities, or clinics. Three hundred and eighty-eight participants made up the sample size, distributed as follows: specialists, general dental practitioners, dental branch practitioners, and rotators. The mother Arabic language translation of a Google form with specific inquiries (demographic and practice questions) distributed and organized online by the distribution of the link on electronic platforms (Facebook, WhatsApp, Telegram, emails, and other social media).

The form only spread to dentists, regardless of their level of employment or specialization. All fields must be filled out because the form cannot be submitted if any are left blank. The form will be distributed to dentists' colleagues in order to ensure the greatest possible participation. Information is gathered from hospitals, health clinics, primary care facilities, and rural health centers. In order to better serve the Iraqi community, the questions are searched for, collected from various websites, and changed. The form only spread to dentists, regardless of their level of employment or area of expertise.

All fields must be filled out because the form cannot be submitted if any are left blank. The form will be distributed to dentists' colleagues in order to ensure the greatest possible participation. The survey include

(1) Basic demographic characteristics gender, professional status, type of dental setup, and working experience).

(2) Practice and drawback questioners regarding the use of a face mask and shield, gloves, and gowns post COVID-19. The second part of the questionnaire was consisting of 12 questions.

The questionnaire consisted of three parts:

#### **First Section: Basic demographic characteristics**

There are five personal questions in this section. Age, gender,

education, employment history, and professional experience (years). Age brackets of 25–30 years, 31–35 years, 36–40 years, 41–45 years, 56–50 years, and over 51 years. Men and women are both genders. Specialist, general practitioner, branch practitioner, and rotator credentials are required. Hospitals, health specialist centers, primary health centers, and rural area health centers are the four work locations that were also recorded. The recommended ranges for professional experience in years were 1–10 years, 11–20 years, and more than 21 years.

**Second Section: Is About the Practicing Principles of PPE**

Seven concentrated questions about using PPE in the work place questions numbered from [1-], these are Do you use a surgical mask for all dental procedures?, Do you use respirators (e.g., N95) when indicated?, Do you use a face shield?, Do you always use the full PPE inspite of the case simplicity?, In vaccinated patients you stay use full PPE?, When you are vaccinated you stay use full PPE?, When the epidemic ends you stay use full PPE?

**Third Section: Drawback.**

In this section authors highlight the difficulties which that prevent the personal implementation or use the PPE in the institutions. The five questions are from [8-12] involve: Is it hard to make decisions while wearing the full PPE?, Face shield affecting your vision?, Do you feel fatigue/tired during or at the end of the dental treatment?, Is your PPE impacting your clinical time?, Is it hard to hear/see around you while wearing the full PPE?

Google form arranged as questions in total divisions collected and analysed. Two point scales are used to assess answers in all sections except the demographical informations, answers ranged from true or false.

**Statistical and Data Analysis**

Information on each participant was entered into an Excel data sheet forum using a Pentium IV. A statistical analysis utilizing the SPSS Package version included three responses [21]. A Likert scale test with a significant p value of 0.05 or less was chosen to be used. The data was then shown in the appropriate tables and diagrams. The percentages for the various group comparisons of the sample variables were discovered by calculating the odd ratio. In order to examine the percentage, mean, and standard deviation values, descriptive statistics were utilized in the data analysis. The Spearman test is used on every question to find correlations. The analysis was performed using IBM SPSS for Windows, version 21.0. The 0.01 level of significance for correlation is two-tailed. **Kruskal-Wallis H** for comparing differences between groups including qualification and experience period between participants.

**Result**

**First Section: Basic demographic characteristics**

Three hundred eighty-eight participants made up the sample size, distributed as follows: specialists, general dental practitioners, dental branch practitioners, and rotators. The group with the largest percentage of participants is general dental practitioners

(129, 33%), followed by specialists (113, 29%). Table 1 focuses on the thorough demographic data of the study sample. The greatest group (118, 30%) is represented by the age group (36-40y). More than half of the participants (227, or 59%) are male. Regarding the workplace, the majority of participants (139, 36%) work in primary health centers. The largest group also has between ten and twenty years of professional experience (165, 43%).

**Table 1:** Demographical Informations of Study Sample.

Variables		Dentists No.	
		No.	%
Age	25-30 y	105	0.27
	31-35 y	42	0.11
	36-40y	118	0.30
	41- 45 y	43	0.11
	46- 50 y	57	0.15
	more than 51 y	23	0.06
Gender	Male	227	0.59
	Female	161	0.41
Qualification	Specialist	113	0.29
	General P.	129	0.33
	branch practitioner	59	0.15
	Rotator	87	0.22
Work-place	Hospital	54	0.14
	Health Specialist Centers	122	0.31
	Primary Health Centers	139	0.36
	Rural Area Health Centers	73	0.19
Professional experience (years)	1-10Y	147	0.37
	10-20Y	165	0.43
	More than 20 Y	76	0.20
Total No. of Sample		388 Dentists	

Questions concerning the dentist's practice PPE are demonstrated in the Table two with details of yes and no numbers and percentages as follow.

**Second Section: practicing principles of PPE (Table 2)**

Seven concentrated questions about using PPE in the work place questions numbered from (1- 7). All dentists are agreed on use a surgical mask for all dental procedures, on the contrary the 60% of dentists claimed that use respirators masks as N95 when indicated. Two hundred dentists not like to use face shields (55%) and quarter of the sample not use full PPE in simple cases (28.8%). Three questions emphasize the state of vaccination whether the patients or the dentists; 65.9% not use full PPE in vaccinated patients on the other side 39% stay use full PPE even if they are vaccinated. Half of the sample state that they still use full PPE when the epidemic ends 51.8%

**Third Section: Drawback.**

Drawbacks for use of PPE result are collected too with six questions are from (22 - 26). All dentists (388) don't agree on the idea that making decision is difficult with the PPE wearing from those 60% find face shield can affect vision to some extent and 73% find that PPE impacting clinical time too. Near fifty / fifty complained that hearing can be less while wearing the full PPE (51% / 49%).

**Table 2: Dentist Practicing and Drawback Opinions about PPE (Questions and Answers)**

Questions Lists	Questions answers			
	Yes		No	
	No.	%	No.	%
<b>Practice</b>				
1. Do you use a surgical mask for all dental procedures?	388	1	0	0
2. Do you use respirators (e.g., N95) when indicated?	232	0.60	156	0.40
3. Do you use a face shield?	173	0.45	215	0.55
4. Do you always use the full PPE inspit of the case simplicity?	276	71.1 %	112	28.8 %
5. In vaccinated patients you stay use full PPE?	132	34 %	256	65.9 %
6. When you are vaccinated you stay use full PPE?	237	61 %	151	39 %
7. When the epidemic ends you stay use full PPE?	187	48.2 %	201	51.8 %
<b>Drawback</b>				
8. Is it hard to make decisions while wearing the full PPE?	0	0	388	1
9. Face shield affecting your vision?	243	62.6 %	145	37.3 %
10. Do you feel fatigue/tired during or at the end of the dental treatment?	388	1	0	0
11. Is your PPE impacting your clinical time?	105	0.27	283	0.73
12. Is it hard to hear/see around you while wearing the full PPE?	197	0.51	191	0.49

**Table 3: Spearman test correlations between the demographical Informations and the questions**  
Questions (1, 8, 10) are omitted from the tables as the all responses are the same for all Participants

		Q2	Q3	Q4	Q5	Q6	Q7	Q9	Q11	Q12
Age	CC.	.805**	.828**	.798**	.834**	.816**	.804**	.786**	.810**	.810**
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.000
Gender	CC.	.974**	.755**	.756**	.605**	.812**	.912**	.510**	.855**	.855**
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.000
Qualification	CC.	.855**	.796**	.794**	.801**	.803**	.864**	.773**	.810**	.810**
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.000
Workplace	CC.	.774**	.892**	.718**	.771**	.872**	.750**	.705**	.846**	.846**
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.000
Experience	CC.	.743**	.838**	.719**	.832**	.809**	.726**	.702**	.791**	.791**
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000	.000

\*\*CC. = Coefficient Correlation is significant at the 0.01 level (2-tailed). Sig. = p value is significant at the 0.01 level (2-tailed).

### Statistical Analysis and Correlation

Spearman test for correlations between the demographical Informations and the questions are highlighted in Table three, questions (1, 8 and 10) are excluded from this test as all the answers are the same. The test shows significant correlation between the demographical data and the questions (Correlation is significant at the 0.01 level (2-tailed)).

In order to show differences in practice, experiences and dentist's opinions; Kruskal-Wallis H Test are used as comparison between the qualifications group and experience as well as. Table Four focus on the difference between question's answers according to qualification (Kruskal-Wallis H Test). The result illustrated the preference related to the rotators as first group (Significance result in 9 questions) followed by the branch certificate group. On the other side specialist and general practitioners show no significant differences.

Kruskal-Wallis H Test is used as comparison between the experiences too. Table Five express the difference between question's answers according to experience (number of years work)

by Kruskal-Wallis H Test. The result illustrated the preference related to the periods ranged from 1 – 10 years as first group. On the contrary long periods of work (20 years) show no significant differences.

### Discussion

The author's goal in writing this article was to examine and appraise the practice and skills of dentists using various reviews of their training and work history, including the effects of challenges in drawback for use if present. The list of questioners is set up to help the dentists of the Nineveh Health Directorate, who all have different qualifications. Three sections, totally involve twelve questions. Qualifications, work experience, and places of employment are included in the first section which assesses demographic information. Males aged between 36-40 years old are the highest group considering that most of the dentists working in the specialized centers more than other institutions.

Authors in this article thought that qualifications can affect positively the decision for stay using PPE even after the epidemic. In the hierarchy of dentist's work starting to be intern for one year, then act as general

**Table 4:** Difference between Question's Answers According to Qualification.

	Qualification	N	Mean Rank	Kruskal-Wallis H	Asymp. Sig.
Q1	Specialist	113	116.50	348.727	0.000
	General P.	129	131.54		
	branch practitioner	59	310.50		
	Rotator	87	310.50		
Q2	Specialist	113	194.50	0.000	1.000
	General P.	129	194.50		
	branch practitioner	59	194.50		
	Rotator	87	194.50		
Q3	Specialist	113	87.00	257.441	0.000
	General P.	129	190.77		
	branch practitioner	59	281.00		
	Rotator	87	281.00		
Q4	Specialist	113	138.50	317.019	0.000
	General P.	129	138.50		
	branch practitioner	59	220.70		
	Rotator	87	332.50		
Q5	Specialist	113	66.50	315.008	0.000
	General P.	129	231.93		
	branch practitioner	59	260.50		
	Rotator	87	260.50		
Q6	Specialist	113	119.00	366.834	0.000
	General P.	129	126.52		
	branch practitioner	59	313.00		
	Rotator	87	313.00		
Q7	Specialist	113	94.00	260.960	0.000
	General P.	129	176.71		
	branch practitioner	59	288.00		
	Rotator	87	288.00		
Q8	Specialist	113	194.50	0.000	1.000
	General P.	129	194.50		
	branch practitioner	59	194.50		
	Rotator	87	194.50		
Q9	Specialist	113	122.50	378.574	0.000
	General P.	129	122.50		
	branch practitioner	59	313.21		
	Rotator	87	314.27		
Q10	Specialist	113	194.50	0.000	1.000
	General P.	129	194.50		
	branch practitioner	59	194.50		
	Rotator	87	194.50		
Q11	Specialist	113	67.95	344.890	0.000
	General P.	129	246.50		
	branch practitioner	59	246.50		
	Rotator	87	246.50		
Q12	Specialist	113	99.00	270.065	0.000
	General P.	129	166.67		
	branch practitioner	59	293.00		
	Rotator	87	293.00		

**(Kruskal-Wallis H Test)**

**Table 5:** Difference between Question's Answers According to Periods of Work (Experience) (Kruskal-Wallis H Test)

Ranks				Kruskal-Wallis H	Asymp. Sig.
	Experience	N	Mean Rank		
Q1	More than 20 Y	147	116.50	216.016	0.000
	10-20Y	165	210.56		
	1-10Y	76	310.50		
Q2	More than 20 Y	147	194.50	0.000	1.000
	10-20Y	165	194.50		
	1-10Y	76	194.50		
Q3	More than 20 Y	147	87.00	298.578	0.000
	10-20Y	165	250.43		
	1-10Y	76	281.00		
Q4	More than 20 Y	147	138.50	0.000	1.000
	10-20Y	165	180.83		
	1-10Y	76	332.50		
Q5	More than 20 Y	147	86.30	327.148	0.000
	10-20Y	165	260.50		
	1-10Y	76	260.50		
Q6	More than 20 Y	147	119.00	215.353	0.000
	10-20Y	165	207.18		
	1-10Y	76	313.00		
Q7	More than 20 Y	147	94.00	265.943	0.000
	10-20Y	165	240.97		
	1-10Y	76	288.00		
Q8	More than 20 Y	147	194.50	0.000	1.000
	10-20Y	165	194.50		
	1-10Y	76	194.50		
Q9	More than 20 Y	147	122.50	211.218	0.000
	10-20Y	165	203.63		
	1-10Y	76	313.95		
Q10	More than 20 Y	147	194.50	0.000	1.000
	10-20Y	165	194.50		
	1-10Y	76	194.50		
Q11	More than 20 Y	147	109.25	232.341	0.000
	10-20Y	165	246.50		
	1-10Y	76	246.50		
Q12	More than 20 Y	147	99.00	247.932	0.000
	10-20Y	165	234.21		
	1-10Y	76	293.00		

dental practitioner then either be as branch practitioners or dental specialists; with no argument; they all will varied in their experience and skills accordingly authors emphasize that the qualifications are distinguish answers from answers with experience.

Although everyone agrees to wear gloves and a mask regardless of the kind, opinions on whether to wear all of the PPE differ in practice (60–70%). The outcome of the vaccine differed depending on whether or not full PPE was worn. This concept may be a reflection of the challenges dentists face during treating patients while wearing complete protective equipment. All dentists in this study agreed were the biggest negative of doing so (100%). Yousef Khader's study of Jordanian dentists in 2020, which included a cross-sectional analysis, agreed with our findings [19].

Dentists think about the challenges to using PPE as a normal protocol in the pandemic, including sixty-two percent of the

participants believe that wearing a face shield can impair eyesight, but nobody agrees that wearing PPE makes it difficult to make decisions, and seventy-three percent reject the notion that it can affecting clinical times. According to a study done on dentists by Sulaimania's in 2020, 67–69% of the dentists think that wearing and doffing are tiresome and difficult activities [20]. PPE used for some special health worker only and other extra equipment to make dental work safer. This can be related to the fact that all dentists at risk of infection and disease transmission as well as the experts make the use of PPE as standard procedure will be continued even post the epidemic.

In a study published by Collin V highlight many risk factors, including physical exertion, an accumulation of heat and humidity, and dehydration, predispose people to heat-related sickness, which is primarily responsible for the bulk of PPE-related symptoms [17,21]. In our study 60% complain from disturbed vision with

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face shield use during work more than 70% don't consider PPE use can take time in use. Researcher thought that it's a manner of tolerance more than principles needed to be able to use full PPE in all dental treatment which might need 5 – 6 hours' work in the day.

As well as recent dental grads might have acquired their practices through social media and other internet channels, which might be less appealing information sources for more experienced graduates [22,23]. Although the authors not include the private clinics in the survey but It's interesting to note that employees in the private sector had better habits than their counterparts in government institutions [24,25]. This might be explained by the fact that dentists in the private sector have more responsibility and are consequently more worried about the security of the clinics that support them. The fact that private-sector dentists are aware of this expectation and make an effort to stay current in order to avoid damaging their reputation in the future may also is related to the fact that people seeking dental care expect better procedures due to the high cost of the procedure.

On the other hand, dentists who work for government agencies have limited contact with patients because they work in shifts and wear PPE that meets standards set by the relevant health authorities [14].

### Limitation of the Study

The comments of these dentists cannot be taken as an accurate representation of their actual practice or behavior in real life, which is a drawback of this kind of research. Additionally, the market was oversaturated with various brands from various countries as a result of the growing demand for PPE, which could have had an impact on dentists' opinions toward PPE. In addition the effect of many infection control programme which applied by the Nineveh Health Directorate should also estimate between the dentists.

### Suggestion

It is suggested that more research be done on the differences between the duties and responsibilities of dentists who work in private practices and those who work for the government, as well as the effect of years of experience on how dentists use and feel about personal protective equipment (PPE). Comparison to be done between different levels or branches of nursing staff also suggested. Comparison between the health workers before and after pandemic training program should be evaluated too.

### Conclusions

On the whole, dentists in the current study are well-versed in PPE for COVID-19 protection. However, it was found that in the majority of the PPE questions, practicing the PPE are crucial for rotators and general practitioners. Therefore, raising dentists' understanding of PPE may improve their belief in it, increase their usage of it, and help them adhere to rules, as well as positively affect their desire to treat infected patients, reduce absenteeism, and reduce their own transfer of infection and disease.

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