

A Survey on Perceived COVID-19 Risk in Dentistry and the Possible Use of Rapid Tests

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ABSTRACT

Aim: The present study was conducted to assess the perceived risk of COVID-19 transmission in dental professionals (DPs), that include dentists and dental auxiliary staffs, and whether rapid tests should be a recommended tool to constrain the transmission of the COVID-19, and who should be bearing their cost (governments, dentists, or patients) through an online survey.

Materials and methods: A sample size of $n = 700$ was recruited in the study. The study included DPs from all over the world. A randomized selection of samples was done through dental groups present on social networks. An online survey was conducted in April 2020, using the Google Form software to provide questions and collect and elaborate answers. Data were analyzed using the statistical software STATA and presented in terms of percentages.

Results: About 78% of the study participants perceived a very high risk of COVID-19 contamination in dental settings. Nearly 80% of the study participants were willing to be subjected to rapid tests and the same could be performed on patients visiting their dental clinics, which could prevent the spread of the disease. About 55% of the participants had reported that additional costs for the rapid tests should be borne by the governments.

Conclusion: The results of the present survey report that DPs do not feel safe and perceive a high risk of COVID-19 contagion and prevention of the disease could be done by performing rapid tests on dentists, dental staff, and patients visiting the dental clinics irrespective of age and gender of the participants.

Significance: Since all the dentists and allied staff have perceived increased risk for COVID-19 transmission, it is important that preventive measures are implemented through rapid test kits at the earliest.

Keywords: Coronavirus, COVID-19, Dental practice, Dentistry.

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INTRODUCTION

The recent outbreak of COVID-19, first in Asia and Europe, and subsequently in the United States, has been followed by pervasive measures implemented by governments to limit the virus transmission. In the above context, dentistry has been experiencing a strong slowdown that has involved closure of offices and facilities as well as the staff reduction as an emergency measure to reduce the risk of cross-infections.

The mode of transmission of SARS CoV-2 is airborne droplets, touching or coming into contact with an infected person or a contaminated surface; saliva or blood are also possible ways of transmission.¹ The nature of dental procedures as well as the close contact with patients increases the risk of COVID-19 transmission.² The disease has a prolonged incubation period ranging between 5 days and 14 days; dentists, dental staff, and patients could be asymptomatic carriers at the time of the dental procedure, which could lead to cross-contamination of the disease.³⁻⁵

The current recommendations for dental professionals (DPs) for prevention of COVID-19 transmission include individual protective equipment, handwashing, mouth rinsing before dental procedures, as well as disinfection of the clinic. In addition to this, an accessible screening test for the disease can also play a major role to prevent transmission in dental clinics. The availability of rapid tests during the first outbreak of the virus, in South Korea, has drastically reduced the number of deaths in comparison with the other countries that responded less promptly. Thus, there is common ground over the importance of rapid test kits in dental clinics for prevention of COVID-19 transmission.⁶

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Currently, there are two rapid tests available to detect COVID-19: direct SARS-CoV-2 antigen detection and indirect antibody detection tests.⁷ The advantage of rapid tests include quick result within 30 minutes, ease of operation, and ease of interpretation of results. However, the disadvantages include decreased sensitivity and specificity than laboratory-performed diagnostic tests. The antigen detection test analyzes the viral components present in the nasopharyngeal secretions, with a probability of producing

false-negatives of around 30%.⁸ Thus, the test can be used to confirm presence of the disease; however, negative results may not be accurate. On the other hand, the antibody tests are based on the antibodies showing the response of the immune system against the virus. However, it cannot be used for early diagnosis as it takes minimum of 10 days for patients to develop the immune response. With the available information, the present study was conducted to assess the perceived risk of COVID-19 transmission in DPs, a term that includes both dentists and dental auxiliary staffs and whether rapid tests should be a recommended tool to constrain the transmission of the COVID-19, and who should be bearing their cost (governments, dentists, or patients) through an online survey.

MATERIALS AND METHODS

A sample size of $n = 700$ was recruited in the study. The study included dentists and dental staff all over the world. A randomized selection of samples was done through dental groups present on social networks. Although the samples were of a heterogeneous nature, the present study will provide useful insights on risk of COVID-19 transmission among dental professionals in clinics. An online survey was conducted in April 2020, using the Google Form software to provide questions and collect and elaborate answers.

The questions were elaborated following the permanent literature about infection control in dentistry as well as the related international guidelines. The survey environment, allowed for anonymity, avoided the social desirability bias, thus induced the respondents to answer more honestly.⁹ Moreover, the questionnaire maintained the privacy and confidentiality of all information collected in the study and ethicality of the study was preserved, as the data were treated at an aggregate level.

With regard to the structuring, the questions were in English and in the form of multiple choice. The questionnaire was divided into two parts.

The first part of the questionnaire was related to the sociodemographic characteristics that were investigated, while the second part, which comprised the bulk of the questions, was concerned with DPs' attitudes toward management of COVID-19 and the perceived risk of contagion in dental clinics.

In the second part of the survey, DPs were invited to answer the following questions:

1. Do you think COVID-19 has changed your perception of infection risks in a dental office?
2. Do you think COVID-19 increased potential risks mainly for dentist and staff (Y) or mainly for patients (N) or equally for both (NS)?
3. Would you prefer the dentists/staff to be subject to routine rapid tests for COVID-19?

4. Would you prefer patients to have in-office rapid tests for COVID-19 before treatment?
5. Do you think that dentists (Y), patients (N), or government (NS) should pay for COVID-19 rapid tests?

Data were analyzed using the statistical software STATA and presented in terms of percentages.

A cross-tabulation, also known as contingency tables, was used to understand the correlation between different variables and to detect patterns and trends within the data. In the analysis, the main variables of interest were gender and age. For gender analysis, a dichotomous variable in STATA was created wherein female was given a value of 1 and 0 otherwise. With regard to the second variable of interest, the study participants were grouped into two macrocategories based on age: DPs younger than 35 years (age <35 years) and DPs older than 35 years (age ≥ 35 years). A cross-tabulation of such variables was done related to the perception of risk, the general perception of risk of infection in the dental care, the risk for DPs, the willingness to undergo a blood test, importance of DPs undergoing routine tests, and, finally, who should bear the additional cost of such tests, the dentist, the patient, or the government.

RESULTS

Of the 700 respondents, 376 were females and 324 were males; their age ranged from 23 to 66 years old (mean age 43.55 ± 14.68). There was a prevalence of European DPs (more than 40%), followed by Middle East, North America, Asia, and South/Central America: overall respondents were from 76 countries, with Italy showing the highest number of respondents. Approximately 40% (281) of participants were dentists, the rest were dental assistant staffs. The results are shown in Tables 1 to 5 and in Figure 1, where are represented the overall answers to the five questions to the above-mentioned questions, given by the two proposed groups differentiated by (a) age and (b) gender.

DISCUSSION

COVID-19 has not only created threat to humanity but also has affected the normal life and profession of many individuals dwelling in the affected areas. In this regard, DPs have been affected very badly owing to the potential risk of spreading the infection, and negative economic impact in dental practice. Indeed, many dental clinics have closed their practice for routine and elective dental procedures to avoid the spread of COVID-19. According to a research conducted by the ADA Health Policy Institute in March, around 76% of dentists in the United States have closed their offices to elective procedures except dental emergencies during the COVID-19 pandemic, while 19% ceased the services to the public in general.

Table 1: Answers to question no. 1 related to age and gender: "Do you think COVID-19 has changed your perception of infection risks in a dental office?"

Answer	>35	<35	Male	Female	Total
No	43	65	48	60	108
%	14.48	16.13	14.81	15.96	15.43
Not sure	15	32	17	30	47
%	5.05	7.94	5.25	7.98	6.71
Yes	239	306	259	286	545
%	80.47	75.93	79.94	76.06	77.86
Total	297	403	324	276	700

Table 2: Answers to question no. 2 related to age and gender: "Do you think COVID-19 increased potential risks mainly for dental professionals (DPs) or mainly for patients or equally for both?"

<i>Answer</i>	<i>>35</i>	<i><35</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
Patients	8	13	13	8	21
%	2.69	3.23	4.01	2.13	3.00
Equally	119	183	124	178	302
%	40.07	45.41	38.27	47.34	43.14
DPs	170	207	187	190	377
%	57.24	51.36	57.27	50.53	53.86
Total	297	403	324	376	700

Table 3: Answers to question no. 3 related to age and gender: "Would you prefer the dentists/staff to be subject to routine rapid tests for COVID-19?"

<i>Answer</i>	<i>>35</i>	<i><35</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
No	45	92	64	73	137
%	15.15	22.83	19.75	19.41	19.57
Not sure	39	75	57	57	114
%	13.13	18.61	17.59	15.16	16.29
Yes	213	236	203	246	449
%	71.72	58.56	62.65	65.43	64.14
Total	297	403	324	376	700

Table 4: Answers to question no. 4 related to age and gender: "Would you prefer patients to have in-office rapid test for COVID-19 before treatment?"

<i>Answer</i>	<i>>35</i>	<i><35</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
No	43	51	50	44	94
%	14.48	12.66	15.43	11.70	13.43
Not sure	19	32	26	25	51
%	6.40	7.94	8.02	6.65	7.29
Yes	235	320	248	307	555
%	79.12	79.40	76.54	81.65	79.29
Total	297	403	324	376	700

Table 5: Answers to question no. 5 related to age and gender: "Do you think that dentists, patients or government should pay for COVID-19 rapid tests?"

<i>Answer</i>	<i>>35</i>	<i><35</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
Patient	48	79	63	64	127
%	16.16	19.60	19.44	17.02	18.14
Government	150	232	152	230	382
%	50.51	57.57	46.91	61.17	54.57
Dentist	99	92	109	82	191
%	33.33	22.83	33.64	21.81	27.29
Total	297	403	324	376	700

With regard to the economic consequences, 82% of respondents have declared that the volume of earnings was reduced fourfold in comparison with previous years. In addition to this, 45% of the dental practice staff was only paid partially, while 28% received no pay and 27% received the whole salary.

Thus, COVID-19 has reshaped the working environment for dentists.¹⁰ Routine calls have been suspended during the pandemic period and appropriate measures to prevent infection have been implemented for attending dental emergencies. The priority is

deemed to protect patients and DPs.¹¹ During the last month, emergency dental care was provided with advice on strict personal protection, and measures to reduce and avoid production of droplets and aerosols were adopted, with the use of high-volume aspiration. In such unprecedented times, it is perfectly plausible to witness a general frustration among DPs.¹² Indeed, they are concerned about the safety of patients as well as of themselves, when so little is known about treatment of COVID-19 infections, contamination, and possible recontamination. To date, only a



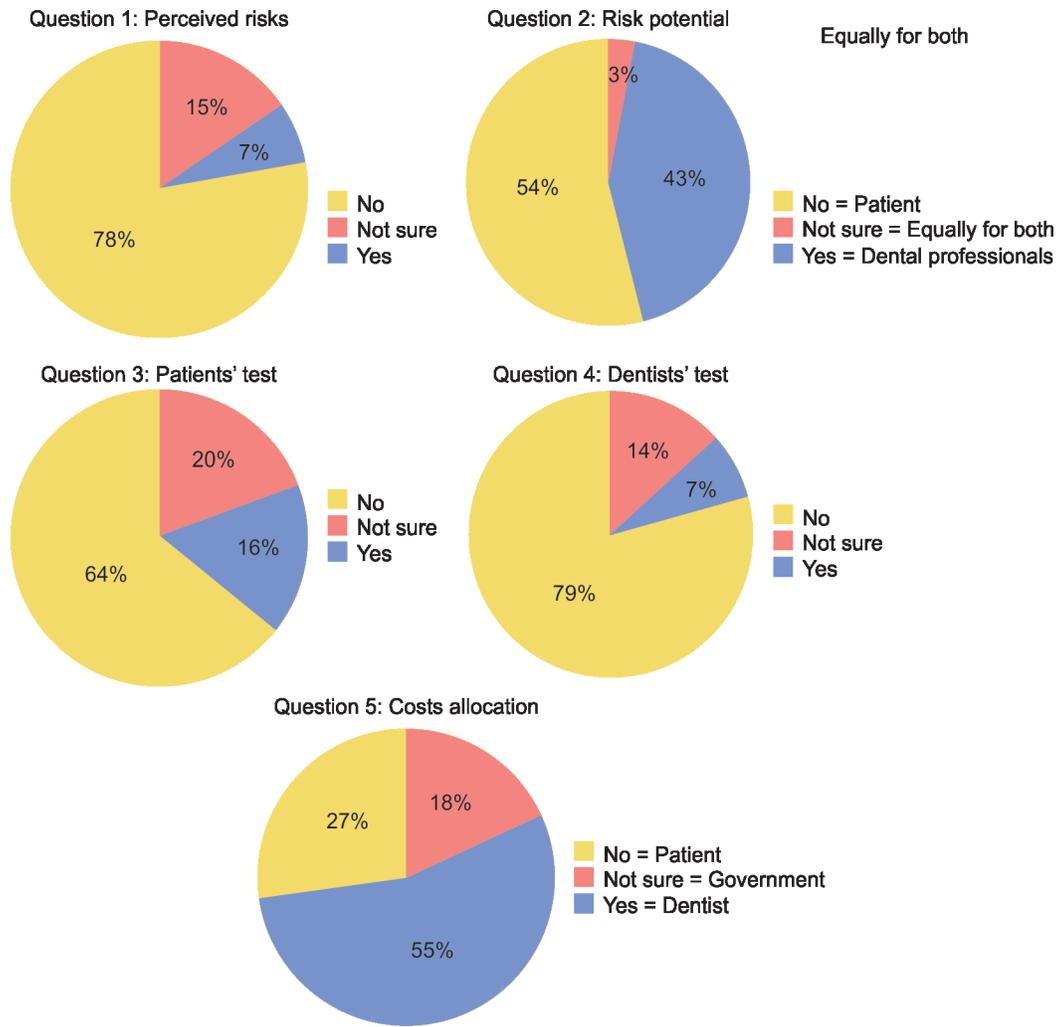


Fig. 1: Visual representation of the percentages provided by pie charts

handful number of articles are available in the literature concerning the implications of COVID-19 on dental care.¹³⁻¹⁵

The results of the survey seem to be consistent to the above-mentioned statements. More specifically, there were five main findings, resulting from the five answers to the questions of interest. First, nearly 78% of respondents perceived a very high risk of COVID-19 contamination during the dental procedure. Such result could be expected, as many governments worldwide obliged dental offices to close, completely or partially, hence treating only emergencies. In addition, it was recommended to avoid production and spreading of droplets and aerosol, thus generating more uncertainty and concern over common dental procedures. Second, the risk of contagion was deemed to be high in dental settings for both patients and DPs, while the latter group was believed to be more exposed and, consequently, more at risk. There were many reports and media news concerning the high percentage of deaths or contagions in doctors and nurses treating COVID-19 patients, which generated some anxiety also among DPs.¹⁶ Moreover, some medical hospital and offices were found to be places where COVID-19 spreads more easily, due to gatherings in small closed waiting rooms. Given developing evidence, many dentists are now concerned that the virus could be transmitted also from asymptomatic patients needing treatment.

In such circumstances, they are continuing to advise that standard personal protective equipment is necessary, but not perceived as enough. This may also explain the results of points 3 and 4. As concerns the latter, a high percentage of dentists (64%) expressed a favorable opinion on performing rapid tests on patients before treatments. When answering to question 3, most DPs (nearly 80%) were willing to be subjected to rapid tests in order to avoid the risk of spreading contagion. It is interesting to know that, regardless of the contradicting opinions about efficacy and precision of rapid tests for COVID-19, these tests were perceived as a major source of prevention. Thus, probably, there is faith in a quick improvement of such screening tools and their social impact is considered valuable. Therefore, in point 5, most DPs (~55%) believed that the additional costs for the rapid testing should be sustained by governments. As an alternative, expenditures should be on dentists (27%) or on patients (18%).

When relating the overall results to the specific subgroups—age and gender—the main finding is that in nearly all answers there are no significant differences within the groups, meaning that DPs of different age and gender groups provided nearly identical answers. Going into further details, both the risks and solutions (rapid tests) are evaluated similarly within the two respondents' groups. Answers have shown that both perceived risks and solutions are

commonly acknowledged by the global dental community: this is a relevant finding, showing how COVID-19 affected, economically and emotionally, DPs all over the world. A few minor differences could be noted only in question no. 4, where older DPs were strongly in favor of the use of rapid tests, probably due to the fact that older population was found to be more at risk of developing lethal pathologies due to COVID-19 infections. In terms of costs, male DPs as well as older DPs, hence above 35 years old, were more willing to bear the cost themselves, while, on the other hand, younger DPs were asking for more help from the government. This is consistent with the fact that, in general, economic crisis will probably affect people with lower incomes more, thus women and younger professionals. In terms of risk for DPs and patients, females were more prone to believe that risks were equally borne, while male DPs were more personally worried. This may be the result of a more emphatic attitude of women, even if the risk was the one perceived as highest for females' respondents as well.

The present questionnaire was designed trying to reduce the incidence of dishonest or bored answers and the errors induced by misinterpretation of questions, by asking a limited number of simple and clear questions; never with standing, limitations of such surveys are mainly related to the difficulties in conveying feelings and emotions into multiple-choice answers. In the present case, however, all questions were answered and the results were never contradictory, showing an overall good compliance from participants.

CONCLUSION

Despite the limitations of the present study, the results point toward a clear direction: DPs do not feel safe and perceive a high risk of COVID-19 contagion. Prevention through routine rapid tests, both on patients and DPs, is perceived as a valid solution to reduce the overall risks. The additional costs for rapid tests should be borne by governments, since dental offices could become relevant partners in a global campaign of rapid tests for the whole population.

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