

Effect of COVID-19 Lockdown on Dental Care of Patients: A Survey Analysis

Shradha Singh¹, Apoorv Rana², Vanshika Jain³, Deborah Sybil⁴,
Himani Khatter⁵

^{1,2}Student, Faculty of Dentistry, Jamia Millia Islamia New Delhi 110025, India.

³Junior Research Fellow, Department of Dental Research and Implantology,
Institute of Nuclear Medicine and Allied Sciences, DRDO, New Delhi 110054, India.

⁴Professor, Department of Oral and Maxillofacial Surgery,
Faculty of Dentistry, Jamia Millia Islamia, New Delhi 110025, India.

⁵Biostatistician, Department of Neurology, Christian Medical College & Hospital Ludhiana, Punjab 141008,
India.

Corresponding Author: Deborah Sybil

ABSTRACT

Background: Routine dental care has been severely affected during COVID-19 lockdown. The primary objectives of the study were 1) to identify major dental problems faced and relief measures adopted during lockdown and 2) to assess awareness and usage of mobile dental apps during lockdown. The secondary objectives were 1) to assess patient willingness for teledentistry and 2) to assess age and gender related difference in approach to dental care.

Materials and Methods: Google forms platform was utilized to create an objective pattern, validated questionnaire and disseminated using various online communication means among 600 patients who had previously reported to the out-patient department. The questionnaire consisted of multiple choice questions enquiring about dental care during lockdown period and awareness and willingness towards teledentistry tools. Collected responses were descriptively analyzed and correlation established using chi-square test.

Results: 516 responses were collected which included 267 males and 249 females from 5-85 years of age. Dental sensitivity was the most common dental problem faced followed by pain. Self-medication and home remedies were the major relief factors. There was no statistically significant difference between the various age groups ($p=0.016$) and between the genders ($p=0.113$) and their willingness to use mobile dental apps.

Conclusion: Age and gender are not significant barriers to acceptance of teledentistry and can be used to facilitate continued dental care. Use of existing mobile dental applications for basic oral hygiene maintenance and tobacco cessation could have been increased with better awareness.

Keywords: COVID-19; Dental Health Surveys; Questionnaires; Remote Consultation; Surveys

INTRODUCTION

Among all the health care services, oral health and dental care are the most affected in the lockdown declared in response to SARS CoV-2 pandemic.^[1] Dental practice is classified as high risk mode of disease transmission and cross infection as it involves close patient contact during naso-oropharyngeal examination.^[2] World Health Organisation (WHO) in a guidance dated August 3, 2020 recommends to prioritize the essential dental care and to delay the non essential dental procedures until there has been sufficient reduction in COVID-19 transmission rates. Also, recommends that patients should be given oral health advice through remote consultations during the pandemic.^[3] The aerosols generated during dental procedures have the potential to settle up to a distance of 100 cm with subsequent virus visibility ranging from 3 hours to several days, increasing risk of disease

transmission to visiting personnel.^[4,5] Therefore dental services have been restricted to urgent and emergency procedures with suspension of routine dental care.^[2]

Patients who were undergoing dental treatment when the lockdown was announced have been the worst affected due to discontinued treatment and persistent dental problems. Those who have missed routine dental check-ups or have neglected minor oral health issues have had to either resort to home remedies or continue previously prescribed medication. Patients who have developed dental problems during this partial shutdown of services have had to adopt newer methods of dental consultation.^[6]

Teledentistry is an umbrella term used for its various subunits which includes, “teleconsultation, telediagnosis, triage and telemonitoring”, that has emerged as a major dental care facilitator during these extended times of restricted services and its applications are not restricted by the type of treatment required and thus, find its advantages in all sub-specialties of dentistry.^[7-10] However, it can be provided to the masses either via synchronous means which includes “real-time telephones/consultation,” “plain old telephones system” and “live audio video interaction” or through asynchronous methods which include “store-and-forward method.” Both the means provide comparable results and patient satisfaction without the need of specialized equipment other than the ones regularly used.^[9,11-13]

Recent years have also seen introduction of mobile applications (apps) and web based dental portals for provision of services like easy appointment booking, imparting knowledge about maintenance and improvement of oral hygiene and online dental consultation.^[14,15] But the efficacy of this system is severely affected by lack of awareness and lower acceptance rates among patients and dentists alike.^[16]

The following is a first of its kind study conducted among the masses using

online survey with an aim to assess patient response to dental care during lockdown. The primary objectives of the study were 1) to identify major dental problems faced and relief measures adopted during lockdown and 2) to assess awareness and usage of mobile dental apps during lockdown. The secondary objectives were 1) to assess patient willingness for teledentistry and 2) to assess age and gender related difference in approach to dental care.

MATERIALS AND METHODS

An online survey was conducted as a cross sectional study, from 10 July 2020 to 22 July 2020, nearly after 110 days of completion of the imposed lockdown in India. Online platform of Google forms was used to create an objective pattern survey titled “Dental Care during Lockdown,” which was distributed among the masses of Delhi-National Capital Region (NCR) via the generated URL.^[17] The questionnaire was sent to 600 patients whose contact details were obtained from the out-patient database of our department. The questionnaire consisted of two sections; the first section contained detailed description of the survey stating the aim of the study and collecting the consent of the participant. The second section consisted of 16 questions (3 on personal information and 13 on dental care).

Among the 13 dental care related questions, the first 7 questions were regarding dental problems faced during lockdown, remedies taken, treatment received and modes of communication with dentist if any. The next 6 questions were related to the respondent’s usage of teledentistry tools and mobile apps during lockdown and their willingness for and opinion on future use of the same. All 13 questions were multiple choice type with an option in which the participant could describe his/her opinion or problems if the mentioned options were not applicable to them.

There was no exclusion criterion; people who didn’t face any dental problem

were also included. Those who were not willing to participate and those who were busy during the period of survey were excluded. Being a first of its kind survey, no sample size was calculated and a convenience sample was opted for.

The questionnaire was generalized for all age groups and participants were included without any gender bias. Informed consent was taken from all participants. In case of respondents from 5-18 years of age, consent was taken from their parent/guardian on their behalf and the forms were filled by the parents/guardian or in presence of parents/guardian. This age group was restricted to answer the 7 questions on dental problems faced and treatment received during the lockdown period and was excluded from answering the 6 opinion based questions to prevent bias. The form was designed in way that can be easily completed on a smartphones, tablet or computer and was kept short to reduce participant fatigue during filling of responses. No incentives were offered to complete the survey.

Statistical Method

Responses collected via the published form were stored using Microsoft

Excel spreadsheet and data analyzed using IBM SPSS Statistics version 23. Descriptive analysis and chi-square test of significance were used, with significance value set at $p < 0.05$.

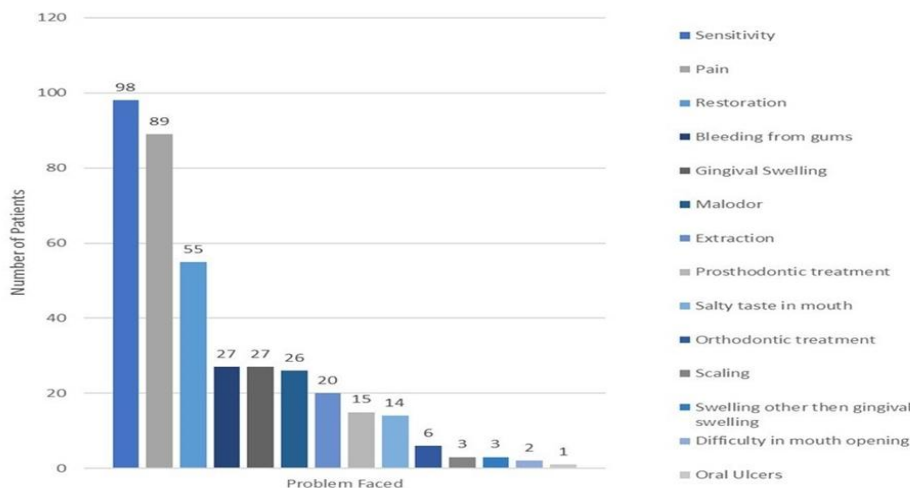
RESULTS

The questionnaire received responses from 86% (516 individuals); 52% males (267 responses) and 48% females (249 responses) with age ranging from 5 to 85 years. 38 respondents belonged to pediatric age group (0-18 years), their responses were filled by or in presence on their guardians/parents. Maximum people belong to age group of 20 to 39 years. (68.6%;354 responses) (Table 1).

Table 1: Age distribution of questionnaire respondents.

Age Distribution	0-19	20-39	40-59	60-79	80-99
Number of Patients	49	354	86	26	1

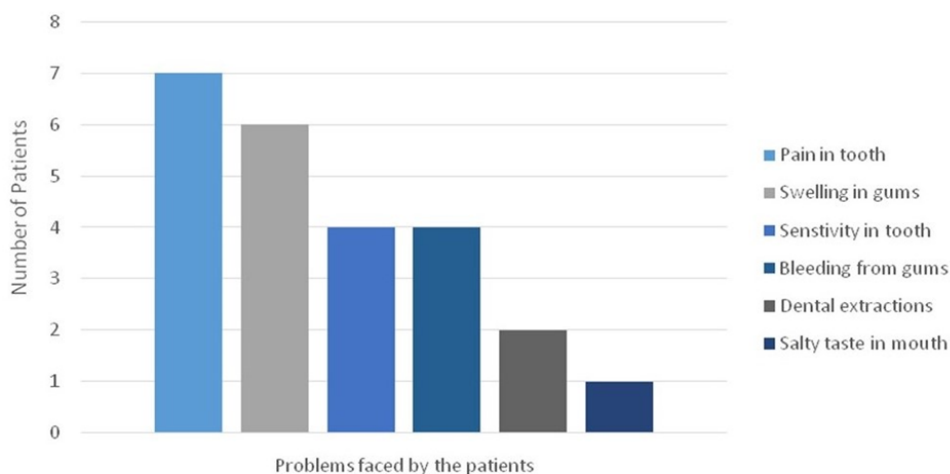
247 (48.1%) of all the respondents faced some form of dental problem during the lockdown period and 87 of them (16.86%) encountered more than one dental related problem. Among the different problems faced, dental sensitivity was the most common problem (19.0%) followed by pain in tooth (17.2%)(Graph 1).



Graph 1: Distribution of different problems faced by patients.

For pediatric patients, nine respondents did not face any dental problem during the lockdown period. Among those who required dental consult, dental pain was

the most commonly encountered complaint (18.4%) followed by gingival swelling (15.8%) (Graph 2).



Graph 2: Dental problems faced by pediatric patients.

Respondents resorted to different means to address their problems; 103 (41.7%) utilized home remedies, 66 (26.7%) took self-medication and 67 (27.07%) adopted other amateur means (Table 2).

Table 2: Measures taken by patients to relieve their problems(s).

Problem	Number of Patients	Percentage
Contacted regular dentist	78	31.57%
Contacted another dentist	25	10.1%
Home-remedy	103	41.7%
Internet remedy	35	14.17%
Friend / Family member advice	32	12.9%
Self-medication	66	26.7%

Out of total, more than half of the respondents (55.6%) felt the need to contact a dentist for their problem during the lockdown period. 11.6% (60) respondents were not able to seek professional care due to varying reasons (Table 3).

Table 3: Measures taken by patients to communicate the dentist.

Problem	Number of Patients	Percentage
Through message	62	12.0%
Through phone call	123	23.8%
By sending photo of the problem site	23	4.5%
Through web based dental app/website	2	0.4%
Through hospital website	2	0.4%
Through a dental consultancy	15	2.9%
I was not able to reach a dentist	60	11.6%
I did not require the need to consult a dentist	289	56.0%

Of the total adult respondents, 281 (54%) were in favor of using dental apps for online consultation in contrast to 52 people (10%) who were not in favor, while the remaining (36%) were not sure about their future preference for the same.

There was no significant difference between various age groups or gender and the preferred mode of communication for dental advice (p value = 0.031 and 0.024 respectively). There was no significant difference between the various age groups and their willingness to use mobile dental apps (p value = 0.016). Patients who were willing to use online dental consultation when restrictions are lifted amounted to 67.2% of the respondents; out of which, 71.8% belonged to the age group of 41-60 years. Majority of the patients above 60 years of age were not willing to use mobile dental apps. 70.4% of the male respondents and 63.9% of the female respondents showed willingness to the use of mobile dental apps, however, there was no statistical difference between the genders (p value = 0.113). Additionally, 82.4% of the adult respondents opined that all dental hospitals and clinics should have teledentistry services.

DISCUSSION

Oral health is a mirror of general health and therefore oral health care needs of the community should be adequately

addressed in spite of the partially shut dental services due to COVID-19 pandemic.^[18] With growing oral health awareness among general public, there is an increased need for improved dental care. It was observed that almost half (48.5%) of the respondents in this study faced one or more dental problems during the imposed lockdown of which merely 36.8% respondents were able to seek professional consultation. Neglecting such routine dental care will not just lead to worsening the condition of the patient but over a period of time, have adverse effects on the oral health status of the community as a whole.^[19] Thus, it is advisable to take necessary steps to ensure unhindered dental care services in the future.

In the absence of access to regular dental care, patients are forced to resort to home based remedies and self-medication. This was evident in 30.2% respondents of this study who turned to these measures to overcome their dental problems. With easy availability of over-the-counter (OTC) drugs leading to increased self-medication, we run the risk of developing antibiotic resistance among the patients and making oral conditions refractory to analgesics.^[20-23] Only 15% of all the respondents in this study had access to their regular dentist and more than 40% relied on remedies suggested by amateur sources (internet, family/friends, home remedies) to relieve their dental troubles. This is where teledentistry can be of a great advantage. Tele-consultation in times of restricted access to dental services ensures that all patients have access to professional consultation and are prescribed appropriate medication for the adequate time duration. It also ensures that every reported dental and oral health problem receives the right treatment, eliminating the risks of over medication and associated detrimental effects.

Two main factors that affect the use of teledentistry in the current situation are patient awareness and dentist willingness. It is not surprising that almost 84% of our

respondents did not use any tools of teledentistry considering that 51% were unaware of the existence of mobile dental apps for online dental consultation. This study also brings out the need to create awareness about available tools of teledentistry among general public to facilitate continued dental care. Kopycka-Kedzierawski et al, in a study demonstrated that teledentistry tools were practical and cost effective ways to improve oral health care in remote areas and also showed that both synchronous and asynchronous models of teledentistry could improve the oral health outcomes.^[24] Many studies have shown how increased awareness leads to increased acceptability and usage of any development in the health care system, ultimately improving the general health condition of any community. In this regard, 82% of our respondents said that all hospitals and dental clinics should have teledentistry services and 67% said that they would like to use these services even after the lockdown period ceased. Use of tele-consultation also enables the doctors to provide signed medicine prescription to the patients. This will not only guide the patient in taking proper medication but will also aid in countering the menace of self-prescribed OTC drugs.

On the other hand, the older generation is more resistant to change, despite numerous benefits and this was proved true in this study too.^[25,26] Respondents above 60 years of age showed maximum resistance to accept the new system of teleconsultation. Surprisingly, the middle age group (41-60 years) showed highest willingness to use teledentistry though the difference between the various age groups was not statistically significant. This study also showed that males and females were equally motivated to adapt to teleconsultation for dental problems; with both patient age and gender not being significant detriments for acceptance of teledentistry.

Another major finding of this survey was lack of awareness among patients

regarding existing dental applications. Among the 516 respondents only around 9% had used mobile dental applications. While only 7.5% of the respondents said that their dentists had recommended use of mobile dental applications. A survey analysis by Underwood B et al, which assessed user perception of mobile app, reported that an oral health app worked in four board themes to help tooth-brushing habit - motivation, education, compliance and perceived benefits.^[27] Existing dental applications play a major role in routine dental care of patients. These applications are useful especially during times like the COVID-19 lockdown, for measures like oral hygiene maintenance and tobacco cessation.

It is also important to highlight that, no advancement comes without an initial cost and barriers which require successful management to establish their long-term benefits and existence. Most of the Indian population, including the ones residing in rural districts, have access to internet facilities, smartphones and/ or computer systems which is visible by almost a two-fold increase in the number of internet connections between 2014 to 2018.^[28] This enables easy access to teledental services without increasing the user cost. However, there is a need of initial investment on part of the dental consultation provider. This investment is targeted towards development of a smooth-running system which provides facilities as promised by the provider. It also requires employment of trained staff with technical expertise to counter any potential system malfunctioning.^[8,11] It also requires establishment of apt(Advanced persistent threats) security measures to avoid misuse of patient's details and breach in their privacy.^[29]

This study was first of its kind study done in terms of assessing patient awareness as well as willingness about teledentistry and its future use. Our study did not focus on assessing dentist willingness, however, similar studies done in the recent past elucidated their willingness for future use of teledentistry as one conducted by

Almazrooa SA et al.^[30] Surveys conducted at the level of post-graduate dental students by Pradhan D et al too highlighted about the awareness and willingness of telecommunication among dentists, however, further measures are required to increase the same.^[31]

Fewer limitations of this study are limited sample size, as the surveyed population was limited to Delhi-NCR region and thereby not assessing the difficulties encountered by people in other parts of the country. Also, the study only assessed and analyzed awareness and willingness of the patient to use teledentistry. It did not evaluate the current usage of teledentistry in the region.

CONCLUSION

Scope and applicability of technology in dental practice is not limited to treatment advances but encompasses provision of consultation services over inaccessible distances. This study highlights the impact of restricted dental services during the lockdown period on dental care of the patients. It also highlights the fact that patients are aware and willing to adapt to newer methods of dental consultation: teledentistry and mobile dental applications. Use of existing mobile dental applications could have been used in addressing routine dental care for patients during the period of extended lockdown.

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