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RESEARCH ARTICLE

TELE-DENTISTRY AN ASSET DURING COVID 19 LOCKDOWN IN LUCKNOW, INDIA: A CROSS SECTIONAL STUDY

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Abstract

Objectives: The objective of the present study was to evaluate patient's perception towards tele-dentistry during lockdown period due to COVID 19.

Methods: This cross-sectional study was a questionnaire-based study where 15 questions based on google form were sent to 40 patients visited to department of Prosthodontics. Out of which 33 patients responded the questionnaire.

Result: Results for this study demonstrated that 40.7% of respondents were under 25 year age group while 33.3% of respondents were from the age group of above 51 year and 25.9 % of respondents were in the age group of 26-50 year. Also it was found that 45.5% patients brush twice daily, only 33.3% patients were following the tooth brushing as well as mouth washing regularly and 34.4% were agreed that tele-dentistry is an appropriate alternative to hospital visit during the pandemic situation whereas 40.6% patients responded that tele-dentistry may be used as an alternative to hospital visits.

Conclusion: With the present study it was concluded that patients have positive inclination towards precative measures to spread the infection of novel corona virus, which inclined them to prefer tele dentistry as an alternative to the hospital visits.

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Introduction:-

The COVID-19 was originated from Wuhan, China in December 2019. It was having the pneumonia like symptoms with cough, fever, myalgia or fatigue and abnormal chest CT, some patients also reported headache, sputum production, haemoptysis, diarrhoea, loss of taste and smell.^{1,2} Some of the clinical symptoms of the disease by this trait of corona virus were different from the severe acute respiratory syndrome (SARS) caused by SARS coronavirus (SARS-CoV) that happened in 2002–2003, indicating that a new person-to-person transmission infectious agent has

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caused this emergent viral pneumonia outbreak.^{3,4} This infectious agent causing viral pneumonia was identified as a novel coronavirus (2019-nCoV) in Wuhan.⁵

This viruses of plus-stranded RNA as their genome belong to the family of Coronaviridae, of the order Nidovirales.^{6,7} At present, four genera of coronaviruses are : α -CoV, β -CoV, γ -CoV, and δ -CoV.^{8,9} Human and Vertebrates both can get infected by most of the coronavirus. Respiratory, gastrointestinal, and central nervous systems are affected by α -CoV and β -CoV, while γ -CoV and δ -CoV causes infection mainly in birds.^{6,10,11} The β -CoV includes SARS-CoV and MERS-CoV. Phylogenetic analysis based on viral genome concluded that the 2019-nCoV belongs to the β -CoV.^{5, 12} The similarity of genome nucleotide sequence of coronavirus (BatCoV RaTG13) with the bat *Rhinolophus affinis* was found around 96.2% in Yunnan Province, China, and 2019-nCoV, this was indicating the *Rhinolophus affinis* bat could also be the natural host of novel coronavirus.⁵ Differences also suggested that there are more intermediate hosts between the bat and human. Two modes of transmission are direct transmission (cough, sneeze, and droplet inhalation transmission) and contact transmission (contact with oral, nasal, and eye mucous membranes).¹³

Transmission of virus to the rest of the world was via human transmission. Till the time several countries reported community spread. Novel viral pneumonia was named as “Corona Virus Disease (COVID19)” On 11th February 2020 by WHO, while on the basis of phylogenetic and taxonomic analysis of this novel coronavirus the international Committee on Taxonomy of Viruses (ICTV) suggested this novel coronavirus name as “SARSCoV-2”. Corona virus disease was declared as pandemic by World Health Organization (WHO) on March 11, 2020. This spread of coronavirus infection was challenging to deal for dentistry and medicine, and dental and medical schools, in all affected countries.

This viral infection was challenging for health professionals also because of its different speeds of reaction and types of response around the world. Not only the medical but also the dental professionals played important role in preventing the transmission of COVID-19. During the lockdown period all routine dental care was suspended in countries experiencing COVID-19 disease, at that point of time the priority of organised urgent care was delivered by teams with appropriate personal protective equipment.¹⁴

Dentistry itself got majorly affected by corona virus disease, chances of exposure of respiratory tract and oral cavity for pathogenic microorganisms, including viruses and bacteria are high in dental patients and professionals. Due to specificity of dental profession for frequent exposure to saliva, blood, and other body fluids, and the handling of sharp instruments, risk of nCoV infection also increased and this pathogenic microorganisms can be transmitted by inhalation of aerosol generated during dental procedures that can remain suspended in air for long period.¹⁵ Other modes of transmission can be direct or indirect, direct transmission occurs due to contacting with blood, oral fluids, or other patient materials¹⁶ like contact of conjunctival, nasal, or oral mucosa with droplets and aerosols containing microorganisms generated from an infected individual and propelled a short distance by coughing and talking without a mask^{17,18} whereas indirect transmission occurs by coming in contact with contaminated instruments and/or environmental.¹⁹ Any of the above mentioned condition can cause infection in dental clinics and hospitals, especially during the outbreak of 2019-nCoV.

The COVID-19 pandemic has taken our lives by storm, especially the people suffering from various ailments who are facing a tough time due to the non-availability of physical healthcare. In such times, where every person is worried about their life and scared beyond any normal behaviour, oral health has taken a back seat. Patients who suffer from dental issues are in dilemma over available options to address their unbearable toothache, bleeding disorders and other serious oral health issues. Even the ones who have just minor queries can't contact the dental health specialist due to the prevailing lockdown situation. That's when the tele-dentistry comes into picture.⁶

The combination of internet, tele-communication and dentistry has provided new and important field that has endless potential. In areas with inadequate medical and dental care, tele-dentistry can be used to improve access to oral health services and can act as a practical solution in emergency aid, initial consultation, and expert opinion.

So, the aim of this study was to check the practicality of tele-dentistry in assessing as well as treating patient's dental problem during lockdown due to COVID 19. Moreover, this study evaluated patient's perspective on treatment through tele-dentistry.

Materials and methods:-**Study setting:**

The present study was a descriptive cross-sectional study, done amongst the patient during COVID 19 pandemic specially the patient those who were not able to visit during lockdown (25th March to 31st May) for follow up. Patients who required dental treatment during lockdown were enrolled in the study.

Study subjects:

A total of 40 patients contributed their responses for this study.

Inclusion Criteria:

1. Patients who got any type of treatment from our department but now for follow up they are not able to visit.

Exclusion Criteria:

1. Patients who did not receive any treatment from our department.

Scheduling:

Data collection was scheduled from 16th March to 31st May 2020.

Methodology:-

A survey was carried out through online standard questionnaires by google forms (Table -1) with 15 multiple-choice questions as well as open ended questions provided to 40 patients. The questionnaire consisted questions which assess several factors including patient's acceptance towards the given treatment, patient's problem related to the prosthetic treatment, patient's perception towards tele dentistry as an alternative to conventional method.

Table -1:- Tele-dentistry, An Alternative to Hospital Visits During Covid-19? Department of Prosthodontics Crown and Bridge, KGMU, Lucknow U.P.

S.no.	Question
1.	Name/Gender Ans.
2.	Address Ans.
3.	Age group a) under 1 year b) 1-25 year c) 26-50year d) above 51 year
4.	Any associated condition (check all that apply) a) Hypertension b) Diabetes c) Hyperthyroidism d) Hypothyroidism e) Arthritis
5.	Have you received any of the dental treatment mentioned below? (check all that apply) a) Oral prophylaxis (e.g. Cleaning of teeth) b) Restoration (e.g. Filling)/ RCT c) Orthodontic appliance (e.g. Braces) d) Fixed or Removable denture (e.g. Artificial teeth) e) Tooth extraction
6.	Have you received any of the prosthetic treatment mentioned below? (check all that apply) a) Denture (Complete/Partial) b) Implant c) Maxillofacial prosthesis (eye/ear finger etc.)

	d) Night Guard
7.	<p>Do you have pain related to above mentioned prosthesis?</p> <p>a) Yes b) No</p> <p>7a) If yes? Grade it on a scale (1-5) where 1=mild and 5=severe pain.</p> <p>a) 1 b) 2 c) 3 d) 4 e) 5</p> <p>7b) Any medication taken for pain? Ans.</p>
8.	<p>Allergy from any medication? Ans.</p> <p>9. Is there any pus discharge or swelling related to the given prosthesis?</p> <p>a) Yes b) No</p>
9.	<p>Is there any pus discharge or swelling related to the given prosthesis?</p> <p>a) Yes b) No</p>
10.	<p>Is there associated loosening of prosthesis?</p> <p>a) Yes b) No</p>
11.	<p>11. Is there any associated trauma from the prosthesis?</p> <p>a) Yes b) No</p>
12.	<p>How do you maintain oral hygiene?</p> <p>a) Tooth Brushing and mouth wash twice a day b) Tooth Brushing twice a day c) Tooth Brushing and mouth wash once a day d) Tooth Brushing once a day e) Warm saline rinse only</p>
13.	<p>Has Covid-19 pandemic affected your oral hygiene habits?</p> <p>a) Yes b) No</p> <p>13 a) If Yes, How?</p> <p>a) In a good way b) In a bad way</p> <p>13 b) Explain Ans.</p>
14.	<p>14. Following are the suggestions given by dentists to their patients. Which of the following do you find most useful (check all that apply)?</p> <p>a) Stay calm, stay home, stay safe b) Use digital mode for consulting your doctor</p>

	<p>c) Maintain proper oral hygiene (Tooth brushing, Mouth Wash, Warm saline rinse, Interdental cleaning)</p> <p>d) If mild pain-Use Pain killer in doses as advised by your dentists</p> <p>e) if severe pain/ pain with pus discharge (Analgesic+ Antibiotic+ Multivitamin, as advised by your dentists)</p>
15.	<p>Do you feel answering this questionnaire describes majority of your dental problems and can be used as an alternative for hospital visits during this COVID 19 pandemic situation?</p> <p>a) Yes</p> <p>b) No</p> <p>c) May be</p>

Questionnaires were forwarded to 40 patients who all got treatment from our department. Out of 40 patients, 33 patients responded to the given questionnaire. The responses of the patients were recorded, checked for completeness and were progressed for assessment.

Besides the general information of patient’s name, age and address, the questionnaires were also recording the patient’s systemic condition, psychological status during the pandemic and also its effect on patient’s oral hygiene maintenance. The effectiveness of tele-dentistry in solving patient’s problem was also assessed by this questionnaire.

Statistical analysis:

The obtained information was entered as data into the Microsoft Excel sheet which was then analyzed by SPSS software (version 20). The use of descriptive statistics was done to analyze the completed data.

Results:-

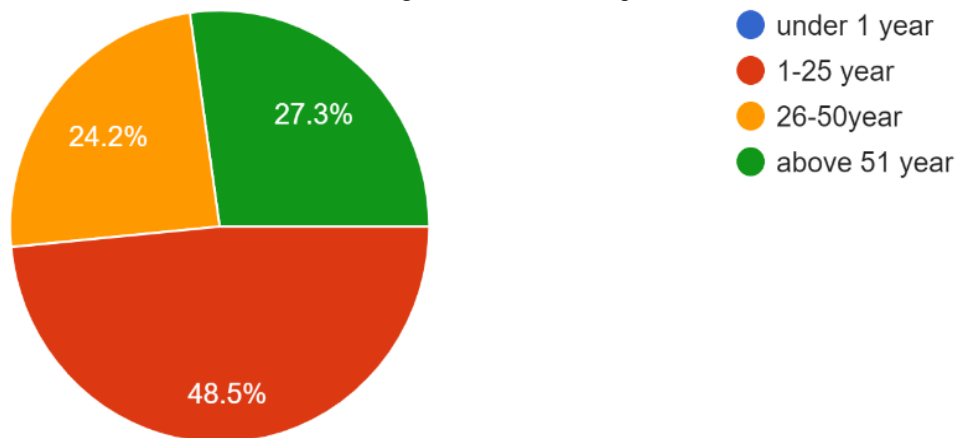
In the present study 33 out of 40 patients were included.

Results for question number (1) demonstrated that 33.33 % of subjects were females’ patient, while 66.66% of subjects encountered male patient.

Results for question number (2) demonstrated that 60.60 % of the subjects were resident of Lucknow while 39.40 % of subjects were from outside Lucknow.

Results for the question number (3) demonstrated that there were 40.7% subjects were below the age of 25 year, while 33.3% of patients were above 51 year in age and between these two age group were 25.9 % of subjects.

Chart 1:- Age distribution of respondents.



Results for question number (4) demonstrated that 42.9% patients were diabetic, whereas patients with hypertension and arthritis both were 28.6% respectively, only 14.3% patients were suffering from hypothyroidism.

Results for question number (6) demonstrated that 82.4% patients received implant treatment whereas 47.1% patients received Crown & Bridge as a prosthetic treatment.

Results for question number (7) demonstrated that only 16.7% patients were having pain associated to the prosthesis given and also only in 12.7% patients out of 16.75% were having severe pain.

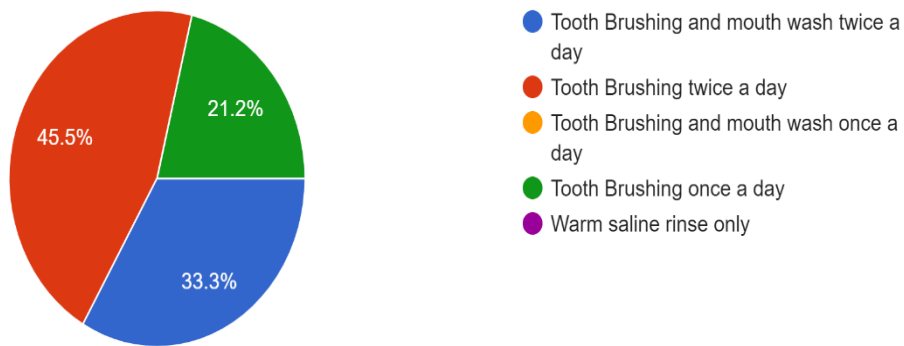
Results for question number (9) demonstrated that in 88.9% patients there was no pus discharge associated with the prosthesis.

Results for question number (10) demonstrated that 80% of patients were not having any type of prosthetic loosening.

Results for question number (11) demonstrated that 88% patients were free from any trauma due to prosthesis.

Results for question number (12) demonstrated that 45.5% patients brush twice daily, only 33.3% patients were following the tooth brushing as well as mouth washing regularly.

Chart 2:- Schedule of oral hygiene.

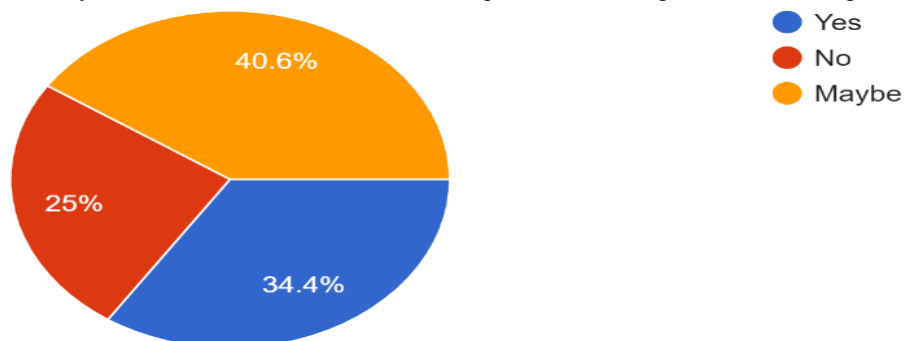


Results for question number (13) demonstrated that 78.8% feels that their oral hygiene get affected by covid 19 pandemic situation, out of which 90.9% believes that this pandemic positively affected their oral hygiene maintain habit.

Results for question number (14) demonstrated that 76.7% patients were agreed with the suggestion of maintaining oral hygiene and around 73.3% patients were also agreed with staying home during this pandemic COVID 19.

Results for question number (15) demonstrated that 34.4% were agreed that tele-dentistry is an appropriate alternative to hospital visit during the pandemic situation whereas 40.6% patients responded that tele-dentistry may be used as an alternative to hospital visits.

Chart 3:-Teledentistry can be used as an alternative for hospital visits during this COVID 19 pandemic situation.



Discussion:-

In India first time the COVID- 19 infection was reported on 30th January 2020. Due to the ongoing scenario of corona virus infection national lockdown was announced by the Prime Minister of India for 21 days on March 24th. This was a major event affecting the entire population of India and this was not the end because due to the increase in number of infected cases Indian government also increased the lockdown period till 3rd May 2020 which was followed by two-week extensions starting 3 and 17 May with substantial relaxations. Due to stability in spread of infection also giving consideration to economic condition of the country government has started unlocking procedure in three unlock phases. Tele-dentistry became an important tool during lockdown like COVID 19.

Tele health includes the new technology of tele-dentistry. This field has increased access to dentists and dental professionals through video and audio conferencing between patient and doctor. The national telehealth policy resource centre defines telehealth as “a collection of means or methods for enhancing health care, public health, and health education delivery and support using telecommunications technologies.” The concept of tele-dentistry was given in 1989 and funded by the group of Westinghouse Electronics Systems in Baltimore. Origin of teledentistry as a branch of tele-medicine was initiated in 1994 in a military project of the united states army.²⁰

The two ways of consulting through tele-dentistry includes – “Real-Time Consultation” and “Store-and Forward Method”.²¹ Real-Time Consultation is basically the live video calling and conferencing where dentist and patient can see, hear, and communicate with one another²² whereas Store-and-Forward Method involves the exchange of static images and stored information’s between dental practitioner and patient.²³

One more method described as “Remote Monitoring Method”, where patients are monitored at a distance and can either be hospital-based or home-based.²⁴

This study was a cross-sectional type and was used to assess perception of patients towards tele-dentistry. This was a questionnaire-based study in which qualitative questions and questions on likert scale were asked. Total 15 questions were included in this questionnaire. The purpose of present study was also to record patient’s problem related to the prosthetic treatment given before the situation of COVID-19, because of that the regular follow-up visits got affected.

We found that maximum response was from the patients with the age group below 25 followed by the above 55-year age group. In the literature about the adaptation towards new technologies it was concluded that adaptation of older adults are slow for new technologies than younger adults but will do so if those technologies appear to have value, for example in maintaining their quality of life.²⁵ Also, it was found that the most common systemic disease affecting the patients who respond was diabetes followed by hypertension.

Maximum respondent has received implant treatment followed by crown and bridge treatment. By evaluating the result, we found that maximum respondent was free from any prosthesis loosening, trauma or pus discharge which is suggestive of fair prognosis of the given treatment. Also, it was clear that only 12.7% patients were suffering some kind of pain which was without any pus discharge, trauma and prosthetic loosening, symptomatic treatment was advised in such cases.

As it is a time of lockdown during COVID-19 pandemic, which has good impact on hygiene and sanitation, we also found in present study that oral hygiene maintenance of the patients was affected positively during this phase. We found 45.5% of study sample was brushing twice daily. Farhan et al²⁷ in their study found the number of people brushing their teeth two times a day were only 21.7%. Similar results were found in a study by Jain et al.²⁸ in Jodhpur where only 23% were brushing twice daily but comparing with the international population studies the brushing twice habit was (62% Kuwaitis²⁹, 67% Chinese³⁰, and 90% of the US population) less common in India.

This study also helped in understanding patient’s awareness towards the spread of infection because with the patients respond it was clear that maximum patients prefer staying home during the pandemic.

As hospital visits itself is a major risk for spread of infection so, patients’ positive response was toward tele dentistry as an alternative to hospital visit. Which can cover their problems and also, they can consult their dentist without hospital visit. It is well known that stress levels are high during such situations of pandemics which can negatively affect the general as well as oral health, in that scenario tele-dentistry also has positive psychological impact.

In some related studies patients anxiety level for delayed dental visits were checked with the help of online questionnaires supplied by public tertiary dental hospitals. They found the questionnaire-based study was useful for understanding patient's psychological status also it was beneficial in giving them suggestions.²⁶

Also, in other studies tele-dentistry was proven as an innovative method of oral health service delivery that can connect dental practitioners and patients. This is important particularly for underserved oral care due to the COVID-19 pandemic. The effectiveness and benefits of tele dentistry have supported to include it in routine dental health service.

We all are aware and observed significant changes in the health services during COVID-19 pandemic. In most of the dental hospitals only emergency treatments were available and non-emergency treatments were suspended. COVID-19 pandemic also affect dental health services in India.

Conclusion:-

With the present study it was concluded that patients have positive inclination towards precatave measures to spread the infection of novel corona virus, which inclined them to prefer tele dentistry as an alternative to the hospital visits. Also, this study helped patient in contacting their dentist during the lockdown, so they were able to maintain their follow-up visit by sharing their problem with the help of questionnaire. Further study should be done focusing on the long-time impact the pandemic on dental care with large sample size.

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