

Era of COVID-19: Now it's Time for Developing Countries to Embrace Telemedicine Use in Clinical Oral Healthcare Services and Research (Teledentistry)

*Kehinde Kazeem Kanmodi^{1,2,3}

*Corresponding Author E-mail: kanmodikehinde@yahoo.com

Contributors:

¹Cephas Health Research Initiative Inc, Ibadan, Nigeria. ²Mental and Oral Health Development Organization Inc, Birnin Kebbi, Nigeria. ³Department of Community Health, Aminu Musa Habib College of Health Science and Technology, Yauri, Nigeria.

Abstract

Oral health is a very vital component of good health and wellbeing. However, the burden of oral disease is so enormous that about 3.5 billion people are affected with the disease globally. To make it worse, there exists inequality in oral healthcare in many parts of the world, more especially in the developing countries. With the on-going COVID-19 pandemic, which is currently characterized by lockdowns, many people are unable to access oral healthcare services. Furthermore, the barriers to the use of telemedicine in the developing countries are so enormous. This paper was a narrative written to discuss the need for developing countries to adopt the use of telemedicine use in oral healthcare services and research (teledentistry) in order to enhance public access to oral healthcare services in this current era of COVID-19 pandemic.

Keywords: Telemedicine, Teledentistry, Oral Healthcare, COVID-19, Lockdown, Developing Country

INTRODUCTION

Oral health, according to the American Dental Association can be defined as “a functional, structural, aesthetic, physiologic and psychosocial state of well-being and is essential to an individual’s general health and quality of life”¹. Furthermore, according to the World Dental Federation, oral health “is multi-faceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex”².

Oral health is a very vital component of good health and wellbeing³. In fact, human life is incomplete without good oral health status. Sadly, we live in a world where about 45% (3.5 billion) of its population are suffering from oral diseases^{3,4}. Unfortunately, the global population-dental personnel ratio is very high, with less than 1 dental personnel per 1,000 people⁵; this shows that many people in the world are underserved when it comes to oral healthcare services.

Worrisomely, the whole world is currently suffering from the on-going COVID 19 pandemic⁶. At this time, the problem of limited access to oral healthcare services has worsened, as many places are under lockdown.

This paper was a narrative review written to discuss the need for developing countries to adopt the use of telemedicine in oral healthcare services and research (teledentistry) in order to enhance public access to oral healthcare services in this current era of COVID-19 pandemic.

COVID-19: OVERVIEW

The coronavirus disease 19, also known as COVID-19, is a highly contagious viral respiratory disease⁷. This disease is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)⁸. The SARS-CoV-2 is transmitted through physical contact with droplets of saliva and/or nasal discharge⁷. The COVID-19 disease took its origin from a wet animal market in Wuhan City, China⁹.

From Wuhan, the disease had rapidly spread across many other places in Asia and all other continents in the world¹⁰.

As at May 13, 2020, a total of 4, 170,424 confirmed cases had been reported globally, with 287,399 deaths¹⁰.

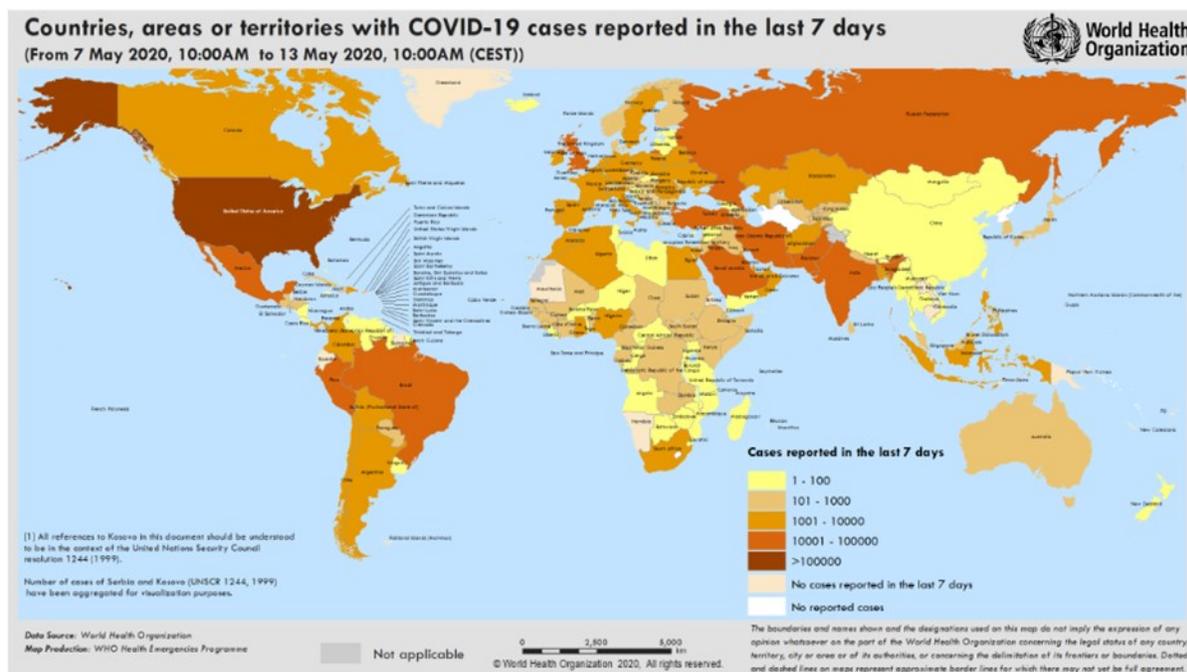


Figure 1. Countries, areas or territories with COVID-19 cases reported from May 7, 2020, 10:00am to May 13, 2020, 10:00am (CEST) [Source: WHO¹⁰]

So far, the world is yet to have a clinically proven and globally certified drug/vaccine for the cure/prevention of COVID-19 disease^{7,11}. This is a serious problem, as so many people are dying from the disease on daily basis¹⁰. However, in order to slow the spread and subsequently reduce the COVID-19 fatality rates, the World Health Organization (WHO) recommended that every nation should fight the disease in solidarity and that every nation should adopt the use of large scale social measures such as movement restrictions, closure of schools and businesses, geographical area quarantine, and international travel restrictions¹².

Also, at the individual level, social distancing, regular hand and respiratory hygiene, and self-isolation practices were recommended¹³.

So far, many nations in the world are under partial or complete lockdown¹⁴. Due to the socio-economic and security effects of COVID-19 lockdowns, human movements had been restricted¹⁴.

CLINICAL ORAL HEALTHCARE PRACTICE AND RESEARCH

Oral health is a very crucial component of overall health, wellbeing, and quality of life³. However, it is unfortunate that 3.5 billion are affected with oral diseases worldwide³. Among the population group living with oral diseases, some will have COVID-19 disease as well. However, they all deserve to be attended to if they contact the hospital for care¹⁵. In the course of attending to such patients, a health worker is at risk of contracting COVID-19 disease¹⁵. However, this risk can be drastically reduced if such health worker adopts the use of universal safety precautions, including the use of personal protective equipment (PPE)¹⁵, and considering that all patients is a potential infector.

Clinical oral healthcare practice is a highly professional and risky clinical practice. This is so because clinical dental practice generally involves close physical contact between dental personnel (such as dentist, dental assistant,

dental nurse, dental therapist, dental hygienist, dentist, etc.) and their patient due to the nature of procedures undertaken in clinical dentistry (Table 1). Virtually all clinical procedures in dentistry involved indirect physical contact with a patient's body fluids such as blood, saliva, and lymphatic fluids. Although, it is expected of a dental personnel to use PPE, including face masks, hand gloves, protective gowns, head gears, etc., when performing these procedures so that indirect physical dentist-patient contact is assured; however, the use of PPE is not 100% safe, as there are possibilities of micro and macro tears of some of these PPE. Also, clinical oral healthcare research had gone a very long way in improving the quality of oral healthcare service delivery globally; through these research

works, high technological and procedural advancements had been made towards dental patient care¹⁶. However, clinical oral healthcare-related research, more especially longitudinal studies, clinical trials, and some non-retrospective cross-sectional studies, often require contact between the dental personnel and the patient. This situation may require the dental personnel and the patient to engage in a conversation, physically or virtually. However, most of these contacts are physical. However, in the current era of COVID-19 which we are in, there is serious restriction of movement; hence, many patients cannot physically access oral healthcare personnel due to the measures placed by the government to curb the spread of the disease^{7-10, 12-14}.

Table 1. Common clinical dental procedures and their status on dentist-patient physical contact

Dental procedure	Status on Physical Dentist-Patient Contact	
	Yes	No
Extra-oral examination	√	×
Intra-oral examination	√	×
Scaling and polishing	√	×
Exodontia	√	×
Dental filling	√	×
Root canal therapy	√	×
Crowning	√	×
Veneering	√	×
Incision and drainage	√	×
Incisional biopsy	√	×
Excisional biopsy	√	×
Curettage	√	×
Periodontal surgery	√	×
Fixation of intra- and extra-oral appliances	√	×
Impression taking	√	×
Tumour excision	√	×

WHAT IS TELEMEDICINE?

Telemedicine, according to WHO, can be defined as “the delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities”¹⁷.

USE OF TELEMEDICINE IN HEALTHCARE SERVICES AND RESEARCH: GLOBAL PERSPECTIVE

The use of telemedicine had been an issue in the world of healthcare services, as some healthcare professionals are “afraid” of using telemedicine. This anxiety was due to their perceived fears that telemedicine will: make them lose their jobs; and reduce their physical presence in the hospitals^{18,19}. Also, there has been disparity in the use of telemedicine between the developed world and the developing world^{20,21,22}. The use of telemedicine is very advanced and it is a main stay in many Western countries like USA, UK, Australia, Norway, Finland, etc. However, the reverse is the case in the sub-Saharan African countries and other low income countries in the world, due to many barriers, ranging from legal issues to socio-economic issues²³.

TELEDENTISTRY – TELEMEDICINE IN ORAL HEALTHCARE

The use of telemedicine in oral healthcare is called “teledentistry”. In oral healthcare, teledentistry can be used in diagnosis, treatment, and follow-up of patients, more especially in the area of preventive services, pharmacological treatment of oral diseases, clinical counselling, and follow-up. Teledentistry can also be used in all other clinical specialties in dentistry as well. Teledentistry strengthens the ability of the dental personnel to: (1) improve public access to oral healthcare services, (2) improve the delivery of oral healthcare, (3) and lower the costs of oral healthcare. It also has the potential to eliminate the disparities in oral health care between urban and rural communities.

Through the use of teledentistry, some clinical oral healthcare research can also be conducted. More details on the relevance of teledentistry can be read in the article written by Jampani and colleagues²⁴. Also, through teledentistry, the rate of spread of COVID-19 can be limited since teledentistry limits physical contact between the dental personnel and the patient.

USE OF TELEDENTISTRY IN THE DEVELOPING WORLD: A NECESSITY

With the very high burden of oral diseases coupled with the rising rates of COVID-19 in the middle- and low-income countries¹⁰, it is time to strategize on how to develop doable strategies that will cater for the oral health needs of their populace. The governments of many of these middle- and low-income countries had executively imposed lockdowns in order to curb the spread of COVID-19 diseases among the populace¹⁴. However, the imposition of these lockdowns cannot stop people from: not consuming cariogenic diets; and not continuing in deleterious oral habits. Rather, the lockdown will most probably increase the rate of practice of such habits, as many people are currently idle. Furthermore, with this issue of lockdown, more people will not be able to access good oral healthcare services, unlike before. Hence, the explosion of the burden of oral diseases should be expected this time and also in the nearest future.

However, through the use of teledentistry, more especially in the developing countries, the oral healthcare needs of the populace can be met to a significant extent. Although, not all forms of clinical curative care services can be rendered via teledentistry; however, some consultative services, preventive care services (such as oral hygiene and dietary counselling), pharmacological management, and behavioural interventions can still be delivered.

In light of the above, it is highly recommended that the developing countries in the world should quickly embrace the use of teledentistry in providing oral healthcare services for their populace. Moreover, the use of this strategy should be supported by the legal frameworks of these concerned countries, as legal frameworks,

amidst other barriers, had been implicated to be a major barrier to its use²³.

CONCLUSION

Teledentistry is the bail-out for providing oral healthcare services in the current era of COVID-19 pandemic, especially during lockdowns. Through the use of teledentistry, the rate of spread of COVID-19 will be reduced; also, through teledentistry, improved public access to oral healthcare services, improved the delivery of oral healthcare, and lowered the costs of oral healthcare services can be assured. Finally, this strategy should be embraced by the governments in the developing countries and supported through the provision of adequate legal frameworks to cover the strategy.

CONFLICT OF INTEREST

Author has none to declare.

FUNDING

This study was self-funded.

REFERENCES

1. American Dental Association. ADA Policy—Definition of Oral Health [Internet]. [Cited 14 May 2020]. Available from: <https://www.ada.org/en/about-the-ada/ada-positions-policies-and-statements/ada-policy-definition-of-oral-health>
2. World Dental Federation. FDI's Definition of Oral Health [Internet]. [Cited 14 May 2020]. Available from: <https://www.fdiworlddental.org/oral-health/fdi-definition-of-oral-health>
3. World Health Organization. Oral Health [Internet]. [Cited 14 May 2020]. Available from: https://www.who.int/health-topics/oral-health/#tab=tab_1
4. Worldometer. Current World Population [Internet]. [Cited 2020 Jan 23]. Available from: <https://www.worldometers.info/world-population/>
5. World Health Organization. Global Health Observatory (GHO) Data [Internet]. [Cited 2020 Jan. 23]. Available from: https://www.who.int/gho/health_workforce/dentistry_density/en/
6. United Nations Development Programme. COVID-19 Pandemic: Humanity Needs Leadership and Solidarity to Defeat the Coronavirus [Internet]. [Cited 2020 Jan 23]. Available from: <https://www.undp.org/content/undp/en/home/coronavirus.html>
7. World Health Organization. Coronavirus [Internet]. [Cited 14 May 2020]. Available from: https://www.who.int/health-topics/coronavirus#tab=tab_1
8. Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR. Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and Coronavirus Disease-2019 (COVID-19): The Epidemic and the Challenges. *Int J Antimicrob Agents* 2020;55(3):105924. doi: 10.1016/j.ijantimicag.2020.105924.
9. Mackenzie JS, Smith DW. COVID-19: A Novel Zoonotic Disease Caused by a Coronavirus from China: What We Know and What We Don't. *Microbiol Aust.* 2020 Mar 17:MA20013. doi: 10.1071/MA20013. [Epub ahead of print].
10. World Health Organization. Coronavirus Disease (COVID-19): Situation Report – 114 [Internet]. [Cited 14 May 2020]. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200513-covid-19-sitrep-114.pdf?sfvrsn=17ebbbe_4
11. World Health Organization. Global Leaders Unite to Ensure Everyone Everywhere Can Access New Vaccines, Tests and Treatments for COVID-19 [Internet]. [Cited 14 May 2020]. Available from: <https://www.who.int/news-room/detail/24-04-2020-global-leaders-unite-to-ensure-everyone-everywhere-can-access-new-vaccines-tests-and-treatments-for-covid-19>
12. World Health Organization. Public health Criteria to Adjust Public Health and Social Measures in the Context of COVID-19: Annex to Considerations in Adjusting Public Health and Social Measures in the Context of COVID-19: 12 May 2020 [Internet]. [Cited 14 May 2020]. Available from: <https://apps.who.int/iris/rest/bitstreams/1277773/retrieve>

13. World Health Organization. Coronavirus Disease (COVID-19) Advice for the Public [Internet]. [Cited 14 May 2020]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>
14. Aura Vision. Global Covid-19 Lockdown Tracker: Visualize the Current State of COVID-19 Lockdowns Around the Globe as it Unfolds [Internet]. [Cited 14 May 2020]. Available from: <https://auravision.ai/covid19-lockdown-tracker/>
15. World Health Organization. Coronavirus Disease (COVID-19) Outbreak: Rights, Roles and Responsibilities of Health Workers, Including Key Considerations for Occupational Safety and Health [Internet]. [Cited 14 May 2020]. Available from: https://www.who.int/docs/default-source/coronaviruse/who-rights-roles-respon-hw-covid-9.pdf?sfvrsn=bcabd401_0
16. Institute of Medicine (US) Committee on Addressing Career Paths for Clinical Research; Kelley WN, Randolph MA, Editors. Careers in Clinical Research: Obstacles and Opportunities. Washington (DC): National Academies Press (US); 1994. Appendix A, Report of the Task Force on Clinical Research in Dentistry. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK236337/>
17. World Health Organization. A Health Telematics Policy in Support of WHO's Health-For-All Strategy for Global Health Development: Report of the WHO Group Consultation on Health Telematics, 11–16 December, Geneva, 1997. Geneva, World Health Organization, 1998.
18. Bagchi S. Telemedicine in Rural India. PLoS Med 2006;3(3):e82.
19. Alverson DC, Swinfen LR, Swinfen LP, Transforming Systems of Care for Children in the Global Community. Pediatr Ann 2009;38(10):579-585. doi:10.3928/00904481-20090918-11
20. Craig J, Patterson V. Introduction to the Practice of Telemedicine. J Telemed Telecare 2005;11(1):3-9.
21. Wootton R. The Development of Telemedicine. In: Rigby, Roberts, Thick, eds. Taking Health Telematics into the 21st Century. Oxon, Radcliffe Medical Press, 2000:17–26.
22. Heinzelmann PJ, Lugn NE, Kvedar JC. Telemedicine in the Future. J Telemed Telecare 2005;11(8):384-390.
23. Wootton R. Telemedicine Support for the Developing World. J Telemed Telecare 2008;14(3):109-114.
24. Jampani ND, Nutalapati R, Dontula BS, Boyapati R. Applications of Teledentistry: A Literature Review and Update. J Int Soc Prev Community Dent. 2011 Jul;1(2):37-44. doi: 10.4103/2231-0762.97695.
25. World Health Organization. Telemedicine: Opportunities and Developments in Member States: Report on the Second Global Survey on eHealth 2009. Available from: https://www.who.int/goe/publications/goe_telemedicine_2010.pdf