

# The Use of Telemedicine in Mitigating the Effects of Reduced Antenatal Care Visits during the COVID-19 Infection Lockdown in Nigeria

Ikechukwu Innocent Mbachu, Samson Dayo Ejikunle<sup>1</sup>, Chioma Ngozichukwu Pauline Mbachu<sup>2</sup>, Jude Ehiabhi Okohue<sup>3</sup>, Osita Samuel Umeononihu, Chukwuemeka Ojiyi<sup>4</sup>, Hilary Obiagwu<sup>5</sup>, Marcel Chukwuemeka Ukah<sup>6</sup>, Ihechinyerem Kelechi Osuagwu<sup>7</sup>

Department of Obstetrics and Gynecology, Nnamdi Azikiwe University, Nnewi Campus, <sup>4</sup>Department of Obstetrics and Gynaecology, Chukwuemeka Odimegwu Ojukwu University, Awka Campus, <sup>5</sup>Department of Obstetrics and Gynaecology, Nnamdi Azikiwe University Teaching Hospital, Nnewi, <sup>1</sup>Department of Obstetrics and Gynecology, Imo State University, Orlu Campus, <sup>2</sup>Department of Paediatrics, Nnamdi Azikiwe University, Awka, <sup>3</sup>Department of Obstetrics and Gynaecology, Madonna University, Elele Campus, Rivers State, <sup>6</sup>Department of Obstetrics and Gynaecology, Reddington Multispecialty Hospital, Lagos, Nigeria, <sup>7</sup>Medical Centre, Federal University of Technology, Owerri, Imo State

## Abstract

**Aims and Objectives:** The study evaluated the use of telemedicine in the management of pregnant women during the COVID-19 in Nigeria. **Subjects and Methods:** This was a cross-sectional study conducted among medical practitioners that care for pregnant women and a self-administered online questionnaire (google form) was used to obtain relevant information from the respondents. Data were analyzed using Stata software version 16. **Results:** A total of 138 medical practitioners participated in the study. The mean age of the participants was  $41.30 \pm 7.5$  years. Seventy (51.47%) work in national public tertiary health institutions while 27(19.85%) work in-state public tertiary and 19(13.97%) in private specialist hospitals. There was a significant reduction in the number of patients seen during the period when compared to the number before the pandemic ( $p=0.013$ ). Fifty-one (36.96%) of the medical practitioners said they practiced telemedicine, with the majority 41(80.39%) using audio calls. **Conclusion:** The use of telemedicine was poor among the medical practitioners despite the drop in antenatal attendance.

**Keywords:** COVID-19 pandemic, Nigeria, pregnant women, telemedicine

## INTRODUCTION

The World Health Organization has declared the coronavirus disease 2019 (COVID 19 infection) as a pandemic affecting more than 200 nations of the world.<sup>[1]</sup> It is estimated that more than 5 million people have been infected, with more than 300,000 deaths related to the disease.<sup>[1]</sup> Nigeria has recorded more than 8000 cases with more than 200 deaths as of May 26, 2020.<sup>[1]</sup> The outbreak of Corona Virus infection (COVID 19) has far-reaching consequences on the health system, economic and social fabrics of the society.<sup>[2]</sup>

Preventive and control measures are being instituted by nations around the world since no evidence-based therapeutic medication has been recommended to date. These measures include the issuance of travel advisories or even flight bans, strict quarantine measures and traveler screenings, implementation of mitigation measures by health-care specialists, application of physical distancing measures for

schools, social and religious gatherings, strict personal hygiene such as frequent hand washing, wearing of personal protective equipment and face masks.<sup>[3]</sup>

Nigeria and India had the highest number of annual maternal deaths in the world in 2017.<sup>[4]</sup> Nigeria had a maternal mortality ratio of about 814 per 100,000 live births as of 2015 and 512/100,000 when the last National Demographic and Health Survey was done in 2018.<sup>[5,6]</sup> This gloomy picture in sub-Saharan Africa may be further worsened by the direct and

**Address for correspondence:** Dr. Ikechukwu Innocent Mbachu, Department of Obstetrics and Gynecology, Nnamdi Azikiwe University, Nnewi Campus, Anambra State, Nigeria. E-mail: imbachu@yahoo.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**For reprints contact:** WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Mbachu II, Ejikunle SD, Mbachu CN, Okohue JE, Umeononihu OS, Ojiyi C, *et al.* The use of telemedicine in mitigating the effects of reduced antenatal care visits during the COVID-19 infection lockdown in Nigeria. *Nigerian J Gen Pract* 2021;19:50-3.

**Submitted:** 10-Sep-2021

**Revised:** 25-Oct-2021

**Accepted:** 26-Oct-2021

**Published:** 17-Dec-2021

### Access this article online

#### Quick Response Code:



**Website:**  
www.njgp.org

**DOI:**  
10.4103/njgp.njgp\_13\_21

indirect impacts of the COVID 19 pandemic on Obstetrics and Gynaecology practice in the region.<sup>[5,6]</sup>

Physical distancing which has been advocated to reduce a person-to-person contact and spread of COVID 19 infection will invariably reduce face to face care. This has led to reduced antenatal visits and attending to only emergencies. Reduced accessibility of maternal services may impact negatively on the health of pregnant women and their unborn babies. In a bid to reduce person-to-person contact, the use of telemedicine has been recommended to bridge the gap between health-care providers and patients. Its usefulness has been documented in situations where there are barriers in assessing face-to-face care.<sup>[7-9]</sup>

This study evaluated the extent of the effect of COVID-19 infection on antenatal and other maternity services. It also evaluated the use of telemedicine among medical doctors to reduce the impact of COVID-19 pandemic on the management of pregnant women in Nigeria during the period of the government-imposed lockdown to limit the spread of the virus in the country.

## METHODS

This was a descriptive cross-sectional study conducted among consenting medical doctors that work in hospitals that care for pregnant women in Nigeria. The study was conducted from 10<sup>th</sup> April to 15<sup>th</sup> May 2020. A self-administered online questionnaire was used (Google form) to obtain relevant information from medical doctors that are involved in the management of obstetrics cases in Nigeria. The participants were contacted through different doctors WhatsApp and Telegram groups. Some were also contacted through their E-mails and personal WhatsApp numbers.

The inclusion criteria were medical doctors working in Nigeria before and during the period of the COVID-19-induced pandemic (the prepandemic was before March 14<sup>th</sup>, 2020). Medical doctors that were not in clinical practice were excluded from the study.

The sample size was calculated assuming at 5% type 1 error, 5% precision error, and expected number of medical doctors using telemedicine before the pandemic at 10%. This was calculated to be 138.

Relevant information obtained included sociodemographic parameters, the average number of patients seen per antenatal visit before the outbreak, and during the lockdown caused by the outbreak of COVID-19 infection pandemic. Others included the use of telemedicine for consultation during the period of COVID-19-induced lockdown, the type of telemedicine used for consultation (audio call, video call, ZOOM).

The data were collated using Microsoft Excel. The data collated were imported into Stata software version 16. The age of the patients was summarized with mean  $\pm$  standard deviation while categorical variables such as cadre of the medical doctor, type

of health institution, and use of telemedicine were summarized with frequency and percentage. Cross tabulations were used to explore the relationship between number of patients consulted before and during the COVID-19-induced lockdown. Test of association was done using Chi-square with  $P < 0.05$ .

## RESULTS

A total of 138 medical doctors participated in the study. The mean age of the participants was  $41.30 \pm 7.50$ , with a range of 27–63 years. Sixty-three (45.99%) were consultant obstetricians. Seventy (51.47%) participants work in Federal Government tertiary health institutions, 27 (19.85%) in State Government tertiary hospitals, and 19 (13.97%) in private specialist hospitals, respectively. Table 1 shows the sociodemographic characteristics of the participants.

Twenty nine (19.57%) of the respondents attended to more than 50 pregnant women per week before the outbreak of the pandemic, while only four (2.90%) respondents were seeing more than 50 clients during the period of the pandemic. This is as shown in Table 2.

There was a significant drop in the number of patients consulted during the pandemic period when compared to the number before the pandemic ( $P = 0.013$ ). This is shown in Table 3.

Fifty-one (36.96%) of the medical practitioners practiced telemedicine while 85 (61.59%) did not practice telemedicine. The most common form of telemedicine practiced was audio call 41/51 (80.39%) [Table 4].

## DISCUSSION

The 138 participants in the study included doctors working in all the geopolitical zones of Nigeria. This report showed that there was reduced attendance to antenatal visits which is consistent with advice by several professional bodies and experts, aimed at reduction of a person-to-person contact and transmission of the COVID-19 infection.<sup>[10]</sup>

The study observed that more than half of the respondents did not use telemedicine despite being aware of telemedicine. Telemedicine became a critical strategy in patients' management because of reduced clinic visits during the period of the lockdown.<sup>[11]</sup> There have been calls to scale up the use of telemedicine in bridging the gap in doctor-patient communication during this period of COVID-19 pandemic.<sup>[12]</sup> Among the practitioners that used telemedicine as a component of care for pregnant women, only a small percentage (<20%) used audiovisual methods which help the practitioners to see and assess the patients. It's estimated that about 40 million Nigerians have mobile phones and more than 90 million use the internet.<sup>[13]</sup> Telemedicine provides a big platform for reaching out and connecting pregnant women and their caregivers. There is an urgent need for a national program on the use of telemedicine in Nigeria since there is no clear guideline from the relevant regulatory and professional bodies.

**Table 1: Sociodemographic characteristics**

Parameter	Frequency (n=138), n (%)
Age range	
<30	11 (8.03)
31-40	60 (43.80)
41-50	53 (38.67)
51-60	11 (8.03)
>60	2 (1.47)
Total	137
No response	1
Zone	
FCT	5 (3.62)
North central	11 (7.97)
North east	5 (3.62)
North west	5 (3.62)
South east	73 (52.90)
South-south	17 (12.33)
South west	22 (15.94)
Total	138 (100)
Rank	
Consultant	63 (45.99)
General practitioner	18 (13.13)
Junior registrar	20 (14.60)
Senior registrar	36 (26.28)
Total	137 (100)
No response	1
Type of practice	
Federal public tertiary	70 (51.48)
General private practice	3 (2.21)
Primary health care	3 (2.21)
Private specialist	19 (13.98)
Private tertiary	7 (5.15)
State secondary	7 (5.15)
State public tertiary	27 (19.82)
Total	136
No response	2
Number of years of practice	
<10	69 (52.27)
11-20	47 (35.61)
>20	16 (12.12)
Total	132
No response	6

FCT: Federal capital territory

The low uptake of telemedicine in the presence of reduced antenatal and hospital visits may have huge implications in the context of reducing maternal and newborn morbidities and mortalities. The country is already burdened with high maternal and neonatal mortality. Less than 50% of the deliveries are attended by skilled birth attendants while antenatal attendance is estimated to be 67%.<sup>[6]</sup> These indices are poor and could be worsened by COVID-19 mitigating guidelines.

Telemedicine is an evolving aspect of medicine that has been shown to contribute positively to maternal and child health.<sup>[8,9]</sup> Simple approaches such as text messages, voice calls, video calls have been used to improve doctor and patient

**Table 2: Impact on the practice**

Type of practice	Average number of patients seen before COVID-19				
	<10	10-30	31-50	>50	Total
Federal public tertiary	4	38	16	12	70
General private practice	1	2	0	0	3
Primary health care	0	3	0	0	3
Private specialist	2	11	2	4	19
Private tertiary	2	3	2	0	7
State secondary	0	2	1	4	7
State public tertiary	2	10	6	9	27
No response					2
Total	11	69	27	29	138
Type of institution	Number of patients seen during COVID-19 (average number of patients per visit)				
	<10	10-30	31-50	>50	Total
Federal public tertiary	52	10	3	0	65
General private practice	2	1	0	0	3
Primary health care	1	1	0	1	3
Private specialist	9	9	1	0	19
Private tertiary	6	1	0	0	7
State secondary	3	3	1	0	7
State public tertiary	12	9	1	3	25
No response					9
Total	85	34	6	4	138
Do you still conduct routine antenatal clinic					
Response	Frequency (%)				
Yes	83 (60.14)				
No	53 (39.86)				

COVID-19: Coronavirus disease 2019

communication without compromising the quality of care.<sup>[7]</sup> There is a pressing need to introduce telemedicine in routine care of pregnant women and their children to bridge the care and communication gaps occasioned by the coronavirus infection in Nigeria.

One of the strengths of this study is that it covers both doctors in private and public sectors, specialists, and general practitioners. To the best of our knowledge, it is among the few studies that evaluated the use of the telemedicine during the period of locked down period in Nigeria.

Despite these obvious strengths, the study did not evaluate the telemedicine preferences of the medical doctors. Future studies will be needed to evaluate provider and client's telemedicine preferences.

## CONCLUSION/RECOMMENDATIONS

The study showed reduced face-to-face antenatal consultation among medical practitioners in Nigeria. There was low uptake and use of telemedicine by the medical practitioners that care for pregnant women. There is a need to train and encourage the use of telemedicine by the medical practitioners in the era of a pandemic like COVID-19 infection. The communication

**Table 3: Comparison of the antenatal consultation before and during the period of lockdown**

Number of patients seen before COVID (average number of patients per visit)	Number of patients seen during COVID-19 (average number of patients per visit)				Total	P
	<10	10-30	31-50	>50		
<10	9	1	0	0	10	0.013
10-30	51	14	1	1	67	
31-50	15	7	3	0	25	
>50	12	12	2	3	29	
No response					7	
Total	87	34	6	4	138	

COVID-19: Coronavirus disease 2019

**Table 4: Use of telemedicine**

Type of practice	Do you practice telemedicine			Total
	No	Yes		
Federal public tertiary	46	24		70
General private practice	2	1		3
Primary health care	2	1		3
Private specialist	7	12		19
Private tertiary	2	5		7
State secondary	6	1		7
State public tertiary	20	7		27
No response				1
Total	85	51		138

  

Type of practice	Type of telemedicine				Total
	Audio call	Video call	Zoom	Others	
Federal public tertiary	20	2	2	0	24
General private practice	1	0	0	0	1
Primary health care	1	0	0	0	1
Private specialist	10	1	0	1	12
Private tertiary	2	0	3	0	5
State secondary	0	1	0	0	1
State public tertiary	6	1	0	0	7
Total	40	5	5	1	51

channels should remain open to address the needs of the patients during the period of pandemic and beyond. While trying to limit the scourge of the COVID-19 pandemic, efforts

should be made not to worsen the already poor maternal and neonatal indices.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### REFERENCES

- World Health Organization. Novel Coronavirus (COVID-19) Situation Report. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>. [Last accessed on 2020 May 26].
- Ozili PK, Arun T. Spillover of COVID-19: Impact on the global economy. SSRN Electro J 2020. [doi: 10.2139/ssrn.3562570].
- Cowling BJ, Leung GM. Epidemiological research priorities for public health control of the ongoing global novel coronavirus (2019-nCoV) outbreak. Euro Surveill 2020;25:2000110.
- Maternal Mortality: Levels and Trends 2000 to 2017. World Health Organization. Available from: <https://www.who.int/reproductivehealth/publications/maternal-mortality-2000-2017/en/>. [Last assessed on 2020 May 26].
- World Health Organization. Trends in Maternal Mortality: 1990 to 2015. Estimates by WHO, UNICEF, UNFPA, World Bank and the United Nations Population Division. Geneva, Switzerland: World Health Organization; 2015. Available from: <http://www.who.int/reproductivehealth/publications/monitoring/maternal-mortality-2015/en/>. [Last assessed on 2020 May 09].
- Nigeria Demographic and Health Survey; 2018. Available from: <https://dhsprogram.com/pubs/pdf/FR359/FR359.pdf>. [Last assessed on 2020 May 26].
- Song H, May A, Vaidhyathan V, Cramer EM, Owais RW, McRoy S. A two-way text-messaging system answering health questions for low-income pregnant women. Patient Educ Couns 2013;92:182-7.
- Greiner AL. Telemedicine applications in obstetrics and gynecology. Clin Obstet Gynecol 2017;60:853-66.
- Odiibo IN, Wendel PJ, Magnann EF. Telemedicine in obstetrics. Clin Obstet Gynecol 2013;56:422-33.
- Ezenwa BN, Fajolu IB, Akinajo OR, Makwe CC, Oluwale AA, Akase IE, *et al.* Management of covid-19: A practical guideline for maternal and newborn health care providers in Sub-Saharan Africa. J Matern Fetal Neonatal Med 2020;18:1-7. [doi:10.1080/14767058.2020.1763948].
- Smith WR, Atala AJ, Terlecki RP, Kelly EE, Matthews CA. Implementation guide for rapid integration of an outpatient telemedicine program during the COVID-19 pandemic. J Am Coll Surg 2020;231:216-22.e2.
- Song X, Liu X, Wang C. The role of telemedicine during the COVID-19 epidemic in China – Experience from Shandong province. Crit Care 2020;24:178.
- O'Dea S. Smartphone Users in Nigeria 2014-2025. Available from: <https://www.statista.com/statistics/467187/forecast-of-smartphone-users-in-nigeria/>. [Last assessed on 2020 Jun 03].