Scholastic Open Access

SCHOLASTIC MEDICAL SCIENCES

Research Article

First *Virtual* International Large-scale Medical and Surgical Mission

Volume 1 Issue 3 - 2023

Clifford C. Eke[1], Christopher Okunseri[2], Onari Duke[3]

[1]*Assistant, clinical professor of Surgery, Loma Linda, University, school of medicine, Loma Linda California.*

[2]*Associate Professor, Director pre-doctoral program in dental public health at Marquette University, Milwaukee, Wisconsin.*

[3]*calabar Women and Children Hospital, Calabar Nigeria*

Corresponding Author: *Clifford C. Eke, Assistant, clinical professor of Surgery, Loma Linda, University, school of medicine, Loma Linda California.*

Received: November 30, 2023**; Published:** December 15, 2023

Abstract

Background: Since the mid-20th century, telehealth or telemedicine programs emerged as a new way or option to provide remote medical and mental health care in developed countries. Telehealth sometimes called telemedicine allows a healthcare provider to render services without an in-person office visit. Telehealth is done primarily online with Internet access on a computer, tablet, or smart phone.

Telemedicine can be defined as the use of medical information exchange from one site to another via electronic communications to improve patient's clinical and medical care during a remote clinical service. There are several options for telehealth care, including talk to healthcare provider live over the phone or video chat, send and receive messages from healthcare providers using secure messaging, email and secure file exchange, and the use of remote patient monitoring. (1) Telehealth was not fully utilized until the Covid-19 pandemic that limited physical contacts among healthcare providers and their patients.

The Association of Nigerian Physicians in the Americas (ANPA) is a nonprofit organization with the vision of "a healthier Nigeria in a healthier world." It is the largest Diaspora health organization in the world for people of Nigeria heritage. ANPA provides free annual medical and surgical services to the underprivileged in Nigeria (www.anpa.org). This practice was interrupted in 2020 by the Covid-19 pandemic. Thus, we had to find another way of providing care via Tele-Health. It was challenging since we could not find any such prior organizational program of remote large-scale medical and surgical care using this novel technology.

Methods

ANPA in partnership with Child Survival and Development Organization of Nigeria (CSDON) had planned a medical mission to Calabar, Nigeria in April 2020. However, on March 11, 2020, the World Health Organization declared coronavirus SARS-CoV-2 or COVID-19 virus as a pandemic, and that trip was canceled. In 2021 because of travel restrictions and scarcity of vaccines for Covid virus, we did not want to cancel the medical outreach again, but instead decided to try the emerging innovative, technology- and pandemic-inspired telehealth to conduct the medical and surgical mission. To our knowledge no such virtual medical and surgical mission plus education activities had ever been carried out on such a large scale by 45 volunteers from the United States of America, and 100 volunteers from the host country, Nigeria, has been reported in medical literature or the press.

We partnered with a technology company named tele-health, Inc. (Newport Beach, California) that built the Electronic Health Record (EHR) platform necessary for virtual care. The company created and donated a cloud based customized site that could be accessed from anywhere in the globe for the medical/surgical mission. We also acquired 14 customized tablet computers, as well as smart telephones that were sent to Calabar, Nigeria for the local volunteers to use for the medical program and to communicate with us.

Multidisciplinary team of volunteers was assembled by ANPA in the USA and included 45 healthcare providers from different disciplines, such as family medicine, internal medicine with specialties of nephrology, infectious disease, cardiology, gastroenterology, geriatrics, preventing medicine and rehab, Emergency medicine, psychiatry, pediatrics, OBGYN, general surgery, head and neck surgery, pediatric surgery, dentistry, radiology, pharmacy, research, IT, Residents and premed students. Similar team of about hundred volunteers was assembled in Nigeria by our local partner CSDON.

In preparation for the mission, the teams held series of meetings weekly on a dedicated Zoom site provided by ANPA, plus WhatsApp, Facetime, and telephone. During the meetings team leaders for each discipline were chosen in both countries and trained on the use of the EHR. Needs Assessments were made by volunteers on ground and reported to the group, logistics were discussed and modified accordingly, procurement of medications and equipment locally plus those from the US and shipment were discussed and executed. From May 30-April 9, 2021, ANPA and CSDON performed the first telehealth-based free medical outreach that included primary care, surgeries, educative lectures, and trainings for capacity building and knowledge transfer. Patients were attended to by the local volunteer healthcare providers on scheduled in person visit, when necessary (with strict adherence to Covid protocols), or virtual care by either the same providers, US based providers, or in conjunction. This was more like a hybrid virtual care, as were the operations, and training workshops like BLS and HBS. All lectures were given over zoom and our local partner provided internet there.

Results

The ANPA/CSDON first ever virtual free medical/surgical mission to Nigeria was a huge success as there were 1,911 beneficiaries in Calabar and neighboring towns. 100 surgical procedures were performed, 689 people were tested for Covid, 211 people received mental health screening and counseling, 11 people were trained in Helping Babies Survive (HBS) course, and 20 people were BLS trained and certified.

Conclusion

We have shown that large scale remote medical and surgical care plus education and training using telehealth, especially in partnership with local partners, are feasible. To the best of our knowledge, this was the first *hybrid*

virtual medical mission of this magnitude in human history! This could serve a blueprint that can be improved upon to remotely take care of patients wherever they may reside, especially in underserved areas of the world, to bridge some of the health inequity gaps.

Introduction

Before the Covid-19 pandemic, direct-to-consumer telemedicine use was utilized by a very small segment of the health care consumer population. (2-4) The rapid expansion of telemedicine in 2020 was facilitated by legislative and executive policies during the public health emergency that removed the "originating site" provision and increased restriction of in-person visits. Personal Protective Equipment (PPE) shortage and high viral transmission levels in many regions in the United States, moved health care to virtual visits at a quick pace. (5) In efforts to continue access to care, health care organizations rapidly deployed and scaled up virtual visits resulting in majority of patients experiencing telemedicine and virtual health care for the first time. (6-8)

Telehealth or telemedicine remote care has become more normalized since the Covid pandemic. Benefits include ability to get healthcare whatever one resides, limited physical contact that reduces exposure to COVID-19 or other infectious diseases, cut down on travel and its expense, decreased time off from work, and the need for childcare.

In April 2021, ANPA adapted to changes in the world and utilized tele-health EHR platform to remotely provide quality free medical and surgical care plus health education to people in Calabar, Nigeria, in collaboration with the local partner, CSDON, during the Covid-19 Pandemic when travel was prohibited. This was the first time for such large-scale international simultaneous telemedicine!

Materials and Methods

ANPA in partnership with Child Survival and Development Organization of Nigeria in (CSDON) had planned a medical mission to Calabar, Nigeria in April 2020. However, on March 11, 2020, the World Health Organization declared coronavirus SARS-CoV-2 or COVID-19 virus as a pandemic, that trip was canceled. In 2021 because of travel restrictions and scarcity of vaccines for Covid virus, we did not want to cancel the medical outreach again, but instead decided to try the emerging innovative, technology- and pandemic-inspired telehealth to conduct the medical and surgical mission. To our knowledge no such virtual medical and surgical mission plus education activities had ever been carried out on such a large scale by 45 volunteers from the United States of America, and 100 volunteers from the host country, Nigeria, has reported in medical literature or the press.

We partnered with a technology company named tele-health (Newport Beach, California) that built the Electronic Health Record (EHR) platform necessary for virtual care. The company created and donated a cloud based custom site that could be accessed from anywhere in the globe for the medical/surgical mission. We also acquired 14 customized tablet computers, as well as smart telephones that were sent to Calabar, Nigeria for the local volunteers to use for the medical program and to communicate with us.

Multidisciplinary team of volunteers was assembled by ANPA in the USA and included 45 healthcare providers from different disciplines, such as family medicine, internal medicine with specialties of nephrology, infectious disease, cardiology, gastroenterology, geriatrics, preventing medicine and rehab, Emergency medicine, psychiatry, pediatrics, OBGYN, general surgery, head and neck surgery, pediatric surgery, dentistry, radiology, pharmacy, research, IT, Residents and premed students. Similar team of about hundred volunteers was assembled in Nigeria by our local partner CSDON.

In preparation for the mission, the teams held series of meetings weekly on a dedicated Zoom site provided by ANPA, plus WhatsApp, Facetime, and telephone. During the meetings team leaders for each discipline were chosen in both countries and trained on the use of the EHR. Needs Assessments were made by volunteers on ground and reported to the group, logistics were discussed and modified accordingly, procurement of medications and equipment locally plus those from the US and shipment were discussed and executed. From May 30-April 9, 2021, ANPA and CSDON performed the first telehealth-based free medical outreach that included primary care, surgeries, educative lectures, and trainings for capacity building and knowledge transfer. Patients were attended to by the local volunteer healthcare providers on scheduled in person visit at Calabar Women and Children Hospital (CWCH), when necessary (with strict adherence to Covid protocols), or virtual care by either the same providers, US based providers, or in conjunction. This was more like a hybrid virtual care, as were the operations, and training workshops like BLS and HBS. All lectures were given over zoom and our local partner provided internet there.

Pre-mission survey was administered to all volunteers, and a post-mission survey was also conducted for both volunteers and patients seen. These were IRB approved tools used to collect data to help us understand more about the impact of medical missions, especially this novel approach, guide or streamline future activities, and perhaps drive local healthcare policies. Volunteers completed mission application forms with time commitments and were trained on the EHR platform virtually. Patients consented to care.

Prior to the mission the public was made aware by flyers and Radio jingles handled by CSDON. Because of COVID situation and to avoid large crowds, patients were required to register online and get a number plus appointment for evaluation. Strict COVID protocols were always maintained, including temperature check, masks, eye shield, hand hygiene, and social distancing. We had a COVID team led by Infectious Disease specialist in the US and a local Lab Scientist, who performed the tests during the mission, while being observed on video.

ANPA had bought and sent many medications, medical supplies, PPEs, and 1,200 point of care COVID Antigen tests after prior approval by the National Agency for Food and Drug Administration and Control (NAFDAC). Our COVID testing protocols were according to the standard oropharyngeal and nasopharyngeal swab technique, which we video observed the local volunteers do very well. All patients were asked questions about COVID symptoms then triaged accordingly. All surgical patients were tested while medical patients were tested based on symptoms, high index of suspicion, or at the doctor's discretion. CSDON had agreement with Teaching Hospital Calabar that all positive tests would be sent to them for confirmation with PCR test and possible use of their isolation center vs. home isolation.

The Helping Babies Survive (HBS) educational training and workshop started the mission that first weekend and trained 11 healthcare workers who will in turn train others ("training the Trainers"). These were accomplished over Zoom, but there were mannequins provided at the Calabar Women and Children's Hospital (CWCH) where all medical mission events took place. Periodically attached in this report are some pictures to illustrate different aspects of the mission. Volunteers and patients gave prior consents to the use of the pictures.

The workflow for the Medical and Pediatric team (Primary Care) included direct clinical duties and patient care at the hospital daily from 8AM to 3PM WAT (2AM EST) by local volunteers, followed by virtual medical review from 3PM to 5PM WAT with the US volunteers. This set up was necessary due to the challenge of 6-8 hours' time difference between Nigeria and different parts of the US. During the daily medical review interesting or difficult cases were discussed, care plans developed, follow-ups established, radiologic studies reviewed, and specialist consultations obtained. The Zoom platform allowed screen sharing of the EHR so that all providers could see the patient's medical data at the same time. Sometimes patients would be present and seen by video for further History and Physical etc.

Our Mental Health team designed a screening form with questions that helped the primary care team and triage nurses to open discussions on mental issues and subsequent referral to Psychiatry if certain criteria were met. Efforts were made to educate people, increase awareness, and reduce the stigma against mental illness, a condition more common now with the Pandemic.

Preoperative screening and evaluation of surgical patients were performed by the House Officer then discussed over Zoom or WhatsApp with the US and Nigeria surgery/OBGyn team, followed by scheduling of the cases after review with the anesthesia team. The logistics and performance of safe operations was the most difficult part of the mission, since it involved more teams, including perioperative nurses and staff, and "hands on" participation of international surgeons was not feasible.

The Surgical team's workflow was like (and ran simultaneously with) the medical/pediatric one but lasted till 5:30PM WAT (or beyond) followed by daily all team (including primary care) debriefing at 6PM WAT.

The medical and surgical teams were supported by the Pharmacy team.

Before the mission started ANPA bought medications and supplies (gloves, masks, PPEs, sutures, etc.) locally with the help of the pharmacists in Nigeria. Procurement of authentic local medications from trusted and certified Pharmacies was preferred to assure that patients needing long term supplies would be able to get same medications after the mission ended. Besides organizing and dispensing medications, the Pharmacy team engaged in drug counseling, surveys conduction, and tele-pharmacy.

Emergency Medicine Care (EMC) program started with BLS workshop followed by Lectures on Wellness in Healthcare, Pre-hospital Care, Pediatric EM Highlights, State of the art EM Care, The Mathematics of Happiness, and Robotic Surgery.

Results

The ANPA/CSDON first ever virtual free medical/surgical mission to Nigeria was a huge success as there were 1,911 beneficiaries in Calabar and neighboring towns. 100 surgical procedures were performed, 689 people were tested for Covid, 211 people received mental health screening and counseling (25 were referred to the Psychiatrist, 8 were evaluated and treated), 11 people were trained in Helping Babies Survive (HBS) course, and 20 people were BLS trained and certified, at CWCH. See attached pictures.

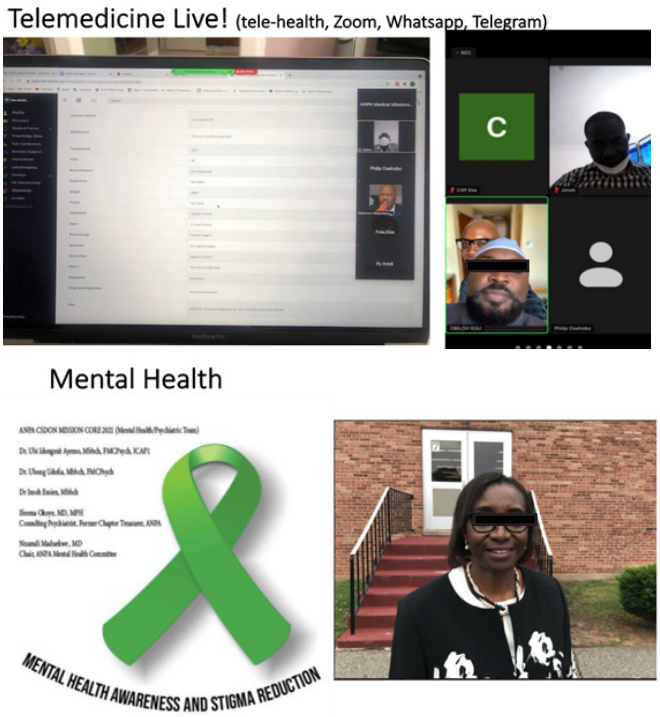

Figure 1

The most common ailments seen included hypertension, diabetes, arthritis, hernias, otitis media, malnutrition, congenital syndromes, depression, and hernias. Types of procedures performed included incisional hernia repair with mesh, adult and pediatric inguinal hernias, colostomy, C-section, myomectomies, hysterectomy, thyroidectomy, lumps and bumps, etc. interesting cases included multiple congenital anomalies like imperforate anus and esophageal atresia (VACTERL syndrome), omphalocele, and very large fibroids.

When we saw that 498 consecutive Covid tests were negative, the team paused and double-checked testing techniques including video of the test being performed without the tester's awareness, and everything looked fine. We then decided to stop testing at the CWCH and to split the remaining 700 tests between another community in Cross River State and we successfully carried out over 100 more tests in Odukpani LGA in Cross River State with a single asymptomatic positive test that was referred and received at the Teaching Hospital for a confirmatory PCR test which came back negative. This confirmed the surprisingly low incidence of Covid in this part of Nigeria during the pandemic.

Figure 2

Figure 3

Discussion

The most common form of telehealth in the USA is video chats, but other ways to use telehealth with patients in remote areas and rural providers exist. Audio-only telehealth cares were approved as a modality during the COVID-19 public health emergency. Remote or rural living, especially in low- and middle-income countries, usually means no access to scarce critical healthcare infrastructure and technology. This translates to more health complications for such patient population. Telehealth can be used to bridge the gap by increasing more access to quality healthcare through video chats, and even other communication that doesn't rely on a broadband internet connection, such as phone calls, secure messaging, and asynchronous care. (9)

Providers from some large healthcare systems in the US now collaborate with rural providers in remote care via telehealth that helps reduce strain on the rural healthcare infrastructure. It was in the spirit of this innovative novel idea that ANPA (acting as "healthcare system"), collaborated with CSDON (acting as "rural health providers"), bridged the care gap in a very large scale during the Covid-19 pandemic, before any other organization or healthcare system.

Summary of the first of its kind ANPA/CSDON free Telehealth Medical and Surgical Mission accomplishments include 1,911 beneficiaries in Calabar

and neighboring towns like Odukpani and Ogoja (225 were Children 0-18 years old), 100 surgical procedures performed, 689 people tested for COVID (no positive result), 211 people received Mental Health Screening and counseling, 11 people HBS trained, and 20 people BLS trained. Per the CWCH Program Manager, "the mission strengthened the capacity of medical volunteers especially those who took part in the HBS and BLS training."

To the best of our knowledge this is the first VIRTUAL medical mission of its kind in human history! It was a multidisciplinary collaboration that allowed patient care, workshops, networking, and knowledge sharing, facilitated by dedicated volunteers in different continents utilizing current and emerging innovative technology. It has created the "blueprint" that can be improved upon to remotely take care of patients wherever they may reside, even in underserved areas of the world. Imagine the possibilities since virtual care is here to stay in the new COVID-19 environment. There are even current healthcare publications highlighting the potential role and benefits of Artificial Intelligence (AI), in different aspects of care delivery, live or remote. (10)

We were able to reach a wider audience with our educational activities and lectures than before, since people could join from anywhere because of the virtual nature. Secure digitized/electronic data collection was accomplished and can be used for research and findings that can positively drive future healthcare access, policies, and outcomes. ANPA donated remaining medications and supplies worth more than $4,255 to CWCH and other neighboring hospitals for Post Mission Program to assure continuity of care for patients with chronic medical conditions that cannot afford care, and to finish some remaining surgical cases.

Numerous challenges were encountered during the entire mission from planning to execution. It was the first time for everyone to try virtual care like this, so we made decisions and adjusted on the go. Technology was not always reliable especially if there was poor internet connection or lack of electricity supply. This was the first time we used EHR for the entire mission, and the workflow plus charting was not easy, as the platform was quickly created and customized for the mission then donated by tele-health Inc. within four weeks. Not an easy feat but it saved the organization lots of money. The time difference of 5-8 hours between the two countries limited some concurrent activities and required the US volunteers to stay up very late and/or get up very early, thus leading to fatigue. In fact, it was more difficult than when we go in person. Procurement of pharmaceutical products, medicines, and supplies was also tough since most had to be bought in the host country. Finally, hands on interaction by US volunteers, especially during surgeries, was not possible.

Conclusion:

We have shown that large scale remote medical and surgical care plus education and training using telehealth, especially in partnership with local partners, are feasible. To the best of our knowledge, this was the first *hybrid virtual* medical mission of this magnitude in human history! This could serve a blueprint that can be improved upon to remotely take care of patients wherever they may reside, especially in underserved areas of the world, to bridge some of the health inequity gaps.

Remote large scale patient care and education is possible via tele-health with adequate and available technology plus willing collaborators working together across the globe. This can also be very impactful in increasing access to safe medical care and procedures plus remote patient monitoring.

In fact, following our telehealth experience, ANPA launched a pilot program in Edo State, Nigeria to provide continuity of care at the end of medical missions. Telemedicine was introduced to provide primary care services also following the medical mission for the management of chronic non-communicable diseases including diabetes, hypertension, arthritis, and obesity. Patient monitoring equipment's like glucometers, blood pressure monitors, scales were provided. In addition, essential drug lists formulary for patients enrolled in Telemedicine services were provided initially by ANPA for the pilot and continued by the state and some donors. Clinical data were uploaded and stored to the patient's electronic medical record automatically.

Contributors List

Pam Moye-Dickenson, Gertie Anyanwoke, Blessing Oriakhi, Stanley Okoro, Nnamdi Maduekwe, Chinyere Anyaogu, Udo Asonye, Jimoh Hassan, Emmanuel Adams, Philip Osehobo, Ugonna Chikeobi, Annette Legogie, Jimoh Hassan, Ifeoma Anwunah-Okoye, Teresa Pounds, Kayode Aiyegbajeje, Chinwe Effiong, Chinwe Ogedegbe, Abraham Chukwu, Iyore James, Dr. Wasiu Adisa, Ofunne Obasi, Ayi Etim, Ubong Akpang, Dr. Larry Obi, Alice Brown, Iso Iso, Gabriel Adim, Ben Nwomeh, Udo Asonye, Ajovi Scott-Emuakpor, Charmaine Emelife, Alphonsus Obayuwana, Amadu Diallo, Obiloh Egu, and all volunteers in both countries too numerous to list here.

Conflicts of interest

None.

References

1. https://telehealth.hhs.gov/patients/understanding-telehealth

2. Jain T, Lu RJ, Mehrotra A. "Prescriptions on demand: the growth of direct-to-consumer telemedicine companies". *JAMA*. 2019;322(10): pp925-926.

3. Reed ME, Huang J, Graetz I, etal. "Patient characteristics associated with choosing a telemedicine visit vs office visit with the same primary care clinicians". *JAMA Netw Open*. 2020;3(6): pp205873.

4. Powell RE, Henstenburg JM, et al. "Patient perceptions of telehealth primary care video visits" *Ann Fam Med*. 2017;15(3): pp225-229.

5. Hollander JE, Carr BG. " Virtually perfect? telemedicine for Covid-19" *N Engl J Med*. 2020;382(18): pp1679-1681

6. Rizzi AM, Polachek WS, et al; "The new 'normal': rapid adoption of telemedicine in orthopaedics during the COVID-19 pandemic". *Injury*. 2020;51(12): pp2816-2821.

7. Gentry MT, Puspitasari AJ, McKean AJ, et al. "Clinician satisfaction with rapid adoption and implementation of telehealth services during the COVID-19 pandemic". *Telemed J E Health. Published online February* 19, 2021.

8. Wosik J, Fudim M, Cameron B, et al. "Telehealth transformation: COVID-19 and the rise of virtual care". *J Am Med Inform Assoc*. 2020;27(6): pp957-962.

9.https://telehealth.hhs.gov/providers/best-practice-guides/telehealth-for-rural-areas

10. Ramshaw B, "AI Can Never Do It Alone." *General Surgery News*. September 2023. 1