

## EXPLORING THE GAINS OF ZOOMING IN TELEMEDICINE COMMUNICATIONS IN NIGERIA

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### Abstract

*The introduction of mobile phones in Nigeria in the year 2000 was a big shift from the constraints of the traditional media of mass communication in the key areas of reach, accuracy and speed. There have been reformations in the mobile telephony so much so that it has established a strong root as an integral aspect of ICTs empowered by Federal Government of Nigeria in 2007 to transfer between a doctor and a sick person, health information for purposes of consultation, diagnosis, treatment and health check in a programme known as telemedicine. The Zoom application of the mobile phone has made it possible for video interaction between the doctor and his patient thus giving a boost to this telemedicine practice. This work anchored on technological determinism theory and technology acceptance model (TAM) studied the extent the Zoom technology can promote health care in Nigeria, extent the people will accept the technology and the problems that might arise from its use. Interview and Library research techniques were used. The researchers found out that Zoom application in spite of its limitations can be relied upon as a support for conventional face-to-face physical contact of medical examination and treatment; that it may take a little while before Nigerians embrace the Zoom Application fully as a result of adjustment to a new innovation and in line with the theories used. The challenges of Zoom Application in telemedicine were identified and included illiteracy in the handling of mobile phones for health-related functions.*

**Keywords:** Healthcare Provider, Mobile Phone, Telemedicine and Zoom Application.

### Introduction

When the government of Chief Olusegun Obasanjo was introducing the use of mobile phones in Nigeria in the year 2000, little did anyone know that the government was creating an integral system that would affect the health system greatly in the long run. Indeed, since this novel introduction there have been reformations in the mobile telephony so much so that the often generally believed use of the technology that is, information dissemination, appears to have been pushed to the back burner while many new uses are evolving. According to Brown (2008), the health system is one area of interest that the communication technology has established a strong root. Thus instead of limiting the use of the mobile phones to information distribution, special communication and messages are sent or shared to promote the health of individuals. This process or technique of using the information and

communication technologies to transfer health information for purposes of consultation, diagnosis, treatment and health check is called telemedicine.

In line with the postulations of Marshall McLuhan as observed by Georgiadou (1995) that the world is collapsed into a globalized village, the ICTs like the internet, the computers, the satellite communication devices and the mobile phones, are used to facilitate health services and treatment in the form of telemedicine. Within seven years of the introduction of the mobile phones in Nigeria (in 2007), the Federal Government of Nigeria introduced telemedicine to enable the use of the computers, the internet, mobile phones and other ICTs to communicate health information and treatment procedures between the care giver and the sick who may be separated geographically. This is a form of support for the conventional face-to-face method of consultation existing before then (Ezema, 2019).

Interestingly, the mobile phone is today suffused with many applications that have made it an indispensable tool in the telemedicine programme. One of such programmes is the Zoom Application which is progressively used for meetings and for real-time (synchronous) telemedicine practice, thus enabling the patient and the doctor to interact 'face-to-face' to find a solution to ailments. One of the targets of contemplating the use of Zoom is to ameliorate the chaos in the health sector in Nigeria that has existed for a long time. According to The Guardian editorial (03/04/19) successive regimes in Nigeria have tried without success to put in place a robust health care system that will cater effectively for the health needs of the teeming population of Nigerians. For example, Nigeria is the second largest contributor to under 5 and maternal mortality rate in the world accounting for 14% of world figure. This has brought about negative health reports about the country. According to Omorumi, Bamidele and Philip cited in Ezema (2019), Nigeria has the following grim health statistics.

Life expectancy in Nigeria has fallen from 53.8 years for females and 52.6 years for males in 1991 to 46 years for females and 45 years for males in 2004. Over one million children under five years die annually in Nigeria as a result of malarial infections, malnutrition and poverty. There is a global deficit of 2.4 million health workers such as nurses, doctors, midwives and the trend is worse in the third world including Nigeria (WHO, 2013). The few medical experts in Nigeria are concentrated in the cities, thus, the over 65% Nigerians living in the rural areas cannot access the experts' services and die avoidable deaths. According to Ogini cited in Ezema (2019), the underserved local/rural communities receive inferior medical care or they had to travel great distances to receive care (from these specialists), which could have dire consequences for the health of the patient especially in instances requiring emergency care. With the aid of simple and ubiquitous devices like the mobile phones and Zoom Application, the face of modern medical and healthcare delivery system may change for good and even spread to such areas as domiciliary services using body sensors monitored by doctors in distant locations. It is expected to enable doctors in rural areas of the world to observe state-of-the-art medical procedures that they would otherwise have had to travel thousands of miles to witness.

### **Statement of the Problem**

The right to life is fundamental to all humans. Everyone aspires to live to old age free from incapacitations and infirmities. However, the predominantly poor majority in Nigeria appear unable to access the few better equipped private and specialist hospitals that are mostly

located in the cities. According to the 2019 Global Multi-Dimensional Poverty Index (MPI) jointly published by the United Nations Development Programme (UNDP) and the Oxford Poverty and Human Development Initiative (OPHI), Nigerian population in Multi-Dimensional Poverty increased from 86 million in 2007 to 98 million (or 51.4% of the population) in 2017. The Publication entitled 'Illuminating Inequalities' reveals inequalities across countries and among the poor. The MPI examined three critical areas of life namely; health, education and standard of living. Out of the 1.3 billion people in the world that were identified as multi-dimensionally poor, Nigeria represents 7.6%.

Arising from the low standard in education especially among the rural dwellers, many do not go for medical check-up and only go to hospitals when their health conditions are in critical states. The people's cultural inclination encourages the belief that most illnesses are caused by the gods and the witches and there is a tendency to resort to prayer houses and native medications. The low level of education affects the perception of the people towards the new media of communication like the use of Zoom in mobile phones. Evidence from literature shows that most people do not know about other uses of the mobile phones beyond dissemination of information. It is doubtful if the benefits of Zoom Application are known to many users of mobile phones. Hence this paper sought to analyse issues that are likely to arise from the use of Zoom Application in accessing telemedicine services in Nigeria viz: extent the people will accept technology - mediated care, how this trend can influence the relational experiences of men and women especially in societies where it is considered a taboo for a woman to interact on phone with any person outside the family cycle and friends, and the problems that may arise with Zoom Application in telemedicine practice.

### **Research Questions**

1. To what extent does zoom application promotes the health care delivery?
2. To what extent do Nigerians accept technology-mediated health care in real time telemedicine?
3. What problems are associated with Zoom Application in telemedicine?

### **Telemedicine Intervention in Healthcare**

The use of Zoom is a new treatment strategy made possible by the emergence of information and communication technologies. It offers participants in a meeting (this time between the doctor and the patient) the opportunity to see themselves, hear themselves and share information, observe body languages and nuances. It is an aspect of telemedicine. Describing telemedicine generally (Bareiss, 2003; Mort, 2003, Roback and Herzon, 2003) cited in Ezema (2019), state that all the definitions relating to telemedicine provide for geographic separation of healthcare provider and patient as well as a mediated content for communication to replace in-person interaction. They defined telemedicine as the “use of telecommunications technologies primarily real-time video conferencing and asynchronous store-and-forward-system to provide healthcare remotely”.

For Altman and Goodman (1994), on the commonplace side of the spectrum are familiar uses of the telephone for consultations between patients and clinicians and the use of radio to link emergency medical personnel to medical centres. On the other end of the telemedicine spectrum are largely experimental innovations such as tele-surgery in which a

surgeon receives visual and tactile information to guide robotic instruments to perform surgery at a distant site. In between these two ends of the spectrum lie an array of video, audio, and data transmission technologies and applications. Some, such as relatively expensive interactive video conferencing now used with Zoom, allow clinicians to see, hear, examine, question, and counsel distant patients for “real – time” diagnostic and therapeutic purposes. Others, based on “store and forward” technologies, permit digital images and other information to be saved and transmitted relatively cheaply to consultants who can receive and interpret them when convenient, thus offering more scheduling flexibility for those on both ends of the communications link.

### **Satellite Backup for Telemedicine in Nigeria**

Telemedicine is supported by NigComSat – 1 telemedicine pilot. This was Nigeria's attempt to put a telecommunication Satellite into place (Onche, 2011). The project faced some problems following the disappearance of the Nig.communication satellite into space. Fortunately, however, President Goodluck Jonathan inaugurated the displaced satellite at Abuja on the 19<sup>th</sup> of March 2012. The Satellite named NigComSat-I-R was installed to replace the May 2007 satellite which “de-orbited into outer-space in November 2008 due to what experts described as “failure in the Solar array” (Daily Sun, 19<sup>th</sup> March, 2012 p.8). The second pilot project was initiated by the National Space Research and Development Agency (NASRDA) Abuja in 2007 in collaboration with the Federal Ministry of Health through provision services by the teaching hospitals.

### **Developing A Sustainable Framework for Effective Telehealth Practice in Nigeria Using Zoom Application**

Using Zoom has shown how telemedicine with HD Video has critically been helpful at various stages of life like during the recent Covid-19 pandemic, when specialists are located in a different area from the patient were interacting using the zoom medium and often times, a care provider can seek expert opinion from his superior colleague. According to George, Lillig (2020), telehealth using Zoom Application can be efficient and effective in times of great public need and also simplifies routine checkups, prescription and general care as hospitals prioritize resources and treatment.

With Zoom physicians will be able to go into their video visit appointments in Hyperspace and launch directly into the video visit in Zoom, while patients will be able to launch into Zoom from their Mychart patient portal on their personal computer or mobile devices. Zoom in Telehealth includes the following features pre-configured: Cloud-based video, audio and content sharing, support for desktop, mobile and conference room systems.

Just like other things tied to globalization, the capabilities are infinite and the opportunities and challenges, incalculable. The world of telemedicine is expanding by the day opening up new areas and opportunities and bringing healthcare delivery closer to home more than ever. Telehealth is expanding its frontiers to such hitherto untested and untried areas as diagnostic and preventive medicine. Today's stress on making medical treatment available to people in remote settings is just one-way telemedicine can be used. The evolution of Zoom Application in the mobile telephony is a big breakthrough. It was founded by Eric Yuan, a Chinese American.

### **Empirical Review**

The Economist (June 7, 2008, p 21) recalls that, “in 2000, a surgeon in New York performed a gall bladder removal on a patient in Paris using a robotic-surgery system called Da Vinci. It was technologically impressive.” In his article, Stokes (2004) vividly describes the development where Barnsley District General Hospital is sending its x-rays and scan abroad to Telemedicine Clinic in Barcelona for examination and analysis because of a national shortage of specialist staff. This guaranteed analysis within three days, or two hours for urgent cases.

The views of medical experts in Nigeria Teaching Hospitals have been sought on the Real-Time (synchronous) telemedicine. Adebayo cited in Ezema (2019), writing under the caption *Telemedicine Can Save 100,000 Lives Daily*,) quoted the then Chief Medical Director of the University College Hospital of Ibadan, Prof. Tope Alonge who affirms that real-time telemedicine can save lives. Prof. Alonge stated that UCH Ibadan was one of the five pioneer hospitals that took part in the telemedicine pilot project. He averred: “We used the space centre in Abuja as the centre of communication because we needed satellite to get images that would allow us to relay images from remote areas in the country. UCH Ibadan had a mobile telemedicine unit which had the major and sophisticated equipment that we used to get to the remote areas and a base unit in UCH which had cameras that can transmit images from all over”.

He further explains that he and his group selected Akinyele Local Government in Ibadan where they saw patients that needed specialist attention but could not come to UCH. He examined some children and sent the images to a specialist in UCH online for advice. In a matter of minutes, the specialist told him that some of the children's eardrums were perforated and he gave us their diagnosis and the treatment we needed”. “If a doctor sees a complicated case at a general hospital, he can relay the images, X-rays, lesions and tumours through ICTs to UCH and we can provide the line of management”, he stated.

A study on the efficacy of telemedicine was carried out at Lagos University Teaching Hospital. In it, Professor Akin Osibogun, then Chief Medical Director, said his institution employed modern communication technologies to improve medical education for interaction between medical experts in Nigeria and encourage exchange of expertise and seminars between Nigeria and India. The benefits of interactive video message like Zoom Application were captured by the professor thus: “On an interactive screen, the patient sees and speaks with his Indian medical consultant. His Nigerian counterparts are also involved in the interactive session. Diagnosis of the ailment of the patient is undertaken and solutions are jointly agreed upon by both doctors. The patient is treated here in Nigeria and he does not have to travel to India.”

### **Theoretical Framework**

Two theoretical frameworks are applied to this study namely; Technological Determinism Theory and Technology Acceptance Model.

#### **The Technological Determinism Theory:**

According to Neil (1992) the term is believed to have been coined by an American Sociologist Thorstein Veblen (1857 – 1929). However, it was Marshall McLuhan who popularized the theory following his studies on media and the culture of England. The theory



states that evolutions in communication have a direct impact on the existing society. Technology determinism has been summarized as the belief in technology as a key governing force in society. The idea is that technological development determines social change. It changes the way people think and how they interact with others and can be described as a three-word logical proposition: "technology determines history".

One of the assumptions of Technological Determinism Theory is that humans do not have much free will - that whatever society as a whole is using to communicate, the humans too will use to communicate (ontological assumptions]. Two general ideas shape the interpretation given in the theory. One is that the development of technology itself follows a predictable, traceable path largely beyond cultural or political influence. Secondly, that technology in turn has 'effects' on societies that are inherent, rather than socially conditioned or produced because that society organizes itself to support and further develops a technology once it has been introduced.

There have been a few cases of criticisms of the Technological Determinism Theory. One of such is that technology creates a set of powerful forces and society organizes itself to meet the needs of this technology. Hence people have little or no control over the outcomes of this technology. However, in a contrasting view, Ogburn (1995) argues that the society adjusts to the consequences of major inventions, but often does so after a period of cultural lag.

### **Technology Acceptance Model (TAM)**

The technology Acceptance Model (TAM) is an information system that models how users come to accept and use a technology. The model states that the actual use of a technology or an innovation is the end-point where we want everyone to be able to use a technology. There is inevitable need for us to form Behavioural Intention which is the factor that leads people to use the technology. The Behavioural Intention is influenced by the attitude which is the general impression created by the technology. TAM suggests that when users are presented with an innovation or technology, there are 3 things that determine how and when they will accept the technology. These include:

1. Perceived usefulness (PU): According to Davis and Venkatesh (2000), PU is the degree to which a person believes that using a particular system will enhance his or her job performance.
2. Perceived Ease of Use (PEU): States that if the technology is easy to use, then barriers are conquered; but if difficult and complicated, the attitude towards such technology will be negative. There are other variables that may affect attitude namely; social influences like level of enlightenment/education age and gender.

The theory is criticized as narrow as some variables such as norms and societal values can influence the behaviour of users and are evaluated subjectively. The model is also criticized for being vulnerable to interpersonal influences like when it is the policy of an organization that its staff use particular technologies no matter the inclination of the staff (Ajibade, 2018).

## **Methodology**

This work used interview method and Library research method. The focus of research is on the acceptance, influence and problems of the Zoom application as an integral aspect of telemedicine as outlined in the research objectives. Five (5) senior lecturers in the Department of Mass Communication and three (3) from Political Science of Godfrey Okoye University and eight (8) senior lecturers (4 from Mass Communication Department and 4 from GS) of the University of Nigeria, Nsukka were purposively selected and interviewed through WhatsApp messages on their views on Zoom Application in health care (if they considered the programme helpful or otherwise in health care and what they foresee as the reactions of patients whose fate might depend now depend on ICT devices. They were also asked to identify the problems that may generally arise from the interaction. Twenty-two (22) final year students of Godfrey Okoye University were also purposively selected and asked the above questions. However, for the students, a short background explanation of Zoom as telemedicine tool was made to simplify their understanding of the subject matter. The criteria for this selection is that this category of people are seen as enlightened enough to understand what Zoom entails. Seven (7) secondary school teachers were purposively selected, educated on zoom, its application demonstrated to them and then asked the same questions. The criteria for the pre-interview coaching was to prepare them because of the technical nature of the subject. Five (5) health workers namely; a private medical practitioner, a pharmacist, a senior nurse, a hospital Administrator and a public health educator were interviewed to give background to the health dimension of the discourse in consideration of their background in health. Also interviewed with the Director of energy Research Centre, UNN, for his evaluation of the technical aspects of the zoom technology. In all, a total of 51 people were interviewed. Publications in newspapers, articles/features and outcomes from studies on telemedicine were analysed and deductions made in answering the research questions.

## **Data Analysis**

### **Question 1: To what extent will zoom application promote the health care delivery?**

Forty-five (45) of the interviewees state the Zoom application will be useful in the health care delivery. This according to them will make health information available to them even with a hand-held device like the mobile phones. The data generated from the interviewees also stated that the use of Zoom application is most appropriate now that there is a very low doctor to patient low ratio in Nigeria. Eight (8) interviewees believed that it will not promote the health sector because the practical aspect where the doctor interacts, touches and even measures some systems like temperature, pulse and respiration may not be feasible online.

### **Question 2: To what extent will Nigerians accept technology-mediated health care in real time telemedicine?**

A greater number of the interviewees (40 or 78%) believe that the patients will accept the technology if it is well explained to them. Some maintained that considering the scarcity of expert doctors in this country, the patients do not have choice but to make use of the available technology to sustain their health. Five of the interviewees believe that the citizens of

Nigeria are not yet educated enough to the level required of the Zoom Application use while 5 others believe that where it is used, there must be a health practitioner by the side of the patient's end of the communication link to measure some vital areas as might be directed by the specialist at the other end of the communication link. To them, the technology will work but with a proviso that the patient needs to be guided.

**Question 3: What problems are associated with Zoom Application in telemedicine?**

The data generated from the interviewees showed that there are many problems that will face the Zoom application in Nigeria. These include patient's poor financial status to buy data that will sustain a long phone interaction, illiteracy which will prevent patients from operating the phone appropriately, lack of or irregular network coverage, lack or irregular power supply to charge phone batteries. There are also the problems of lack of fulfilment as the patient does not get the physical attention of the doctor. Phone discussion can also be transient and easily forgotten and the confidentiality of the patient may leak, especially in households where phones are shared among the family members. There can also be noise from the background during health interactions. Quackery can also be a problem in the implementation of telemedicine. There is no definite way of understanding at once that the other person at the other link of the communication link is a qualified health worker, and so, fraudsters can cash in to cause trouble.

**Discussion of Findings**

There is a strong belief that the Zoom application will facilitate interactions between the doctor and his patient as the patient can operate from his house and consult a specialist residing hundreds of miles away from him. This is a healthy development in Nigeria's health sector which has grim statistics on health. However, there are proponents that for the technology to be effective, there has to be a special arrangement where a patient is accompanied by a trained health personnel before going for zoom discussion with the doctor/ specialist to assist in taking vital statistics as the need may arise. This perhaps becomes imperative given the poor educational background of many Nigerians especially those living in the rural areas of the country.

One of the interviewees, a medical Director of Zenith Hospital Nsukka, described the application of Zoom as a salutary development. He observed that the technology is helpful especially if junior or Corper doctors who are posted in local or distant location should run into troubles. The use of zoom will make it possible for a quick opinion from supervising doctors and save the survival opportunity of the sick. He however, noted that the educational status of most patients living in the rural areas is a limiting factor as many find the approach strange, not to talk of the cost of buying an android phone. According to a Deputy Director of Pharmaceutical Services in Enugu State, the use of zoom is a welcome development in health care as it will help bridge the gap created by inadequate number of health workers but feared that the technology appears made for the elites only in view of the technicalities which need a reasonable level of education. A senior nurse interviewed expressed doubt about the level of satisfaction that patient will get from the zoom mediated treatment maintaining that patients especially those with psychological illnesses need physical touch to get well. A hospital administrator of one of the faith-based organization in Nsukka admitted that zoom is



of assistance to health services especially in monitoring staff compliance to duty and in conferences. He argues that zoom cannot substitute the benefits of human presence at the bedside of the sick person. The public health nurse believes that patient will accept the technology especially as it will reduce the time they spend waiting for the doctor in the hospital. He however observed that the plan is prone to mistakes especially in drug administration as some instructions given via zoom may be easily forgotten. The Director of Energy Research Centreat UNN and a specialist in photovoltaic solar Energy was interviewed on the subject matter to which he submitted that the development of the solar system as an alternative to energy will reduce the problems associated with ICTs like power failure. If solar energy is installed at strategic rural areas, the impact of the zoom will be enhanced and complemented. But a lot of effort should be geared towards the mobilization of the health.

On whether the patient' will accept ICT-mediated cares, there are proponents that the patients will do so. First, it will help mitigate their health crisis in a country where there is dearth of infrastructure and few experts. Moreover, the patients do not seem to have much choice as there are no planned health programme for the citizens by the government in Nigeria, thus everyone appears to be on his own. However, a lot still needs to be done as the place of physical touch appears a big lacuna. According to Keith Carlson (2015), in the past, touch, as well as being able to demonstrate care and compassion, has been central to healing. The laying of hands has been practiced for centuries. From the encouraging hand on a shoulder, to a cool hand on a feverish forehead, touch is the hallmark of caring, healing and compassion. Even as technology becomes more central to healthcare, skin-to-skin contact is an art that must remain a central tenet of health care. Patients are often starved for touch and long for human contact. In a situation where ICTs are used to assist healthcare, it takes concerted effort to persuade and encourage the patients' (health consumers) of the gains in the technology. It is in line with the Technological Determinism theory and TAM used in this study for patients to drag for a while before getting the conviction and level of confidence required to submit to the technology.

On the problems that could arise, the data generated from the interviewees agree with the postulations of Dr. Linkous (The Executive Director of American Telemedicine Association),who discussed the prognosis and technological applications in health predicting that it will generate a tsunami of data that will definitely overwhelm human competence to handle obviously referring to the high number of patients and small number of health practitioners (Bakalar, 2008). The report from this study on problems of Zoom application like other ICT-mediated health interventions is supported by the views of Natasha (2010) that ICTs central to telemedicine tend to be taken for granted in developed countries, but are often lacking in sub-Saharan Africa. He submitted that a country like Uganda might only have a modern ICT infrastructure by 2025.

### **Conclusion**

This paper highlighted the health problems in Nigeria and how the introduction of telemedicine could assist in the health care delivery. The development of Zoom application as an integral tool of telemedicine was highlighted. There was analysis of telemedicine technology globally and its gradual evolution in Nigeria. Interview method and Library research method were used to collect data that were analysed.

It was found that Zoom application in spite of its limitations can be relied upon as a support for conventional face-to-face physical contact. It was also observed that because Nigerians have been used to the order of waiting to consult the patient face-to-face, it may take a little while before they embrace the Zoom Application fully. This however is in tandem with both theories used in the work, that people drag in the face of any new innovation or technology and embrace such innovation after a period of cultural lag.

### **Recommendations**

The researchers recommended that:

1. There should be periodic conference on the use of Zoom for health services.
2. Primary health centres should make use of Zoom for patient's follow up as a step to creating awareness on the possibility of using the technology on a wider scale.
3. Telemedicine has to be incorporated into the curricular of secondary students in Nigeria to form part of their health behaviour early in their lives.

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