

Perceived Influence of Information and Communication Technology on Clinical Service Delivery among Caregivers and Patients in Makurdi Metropolis

Awopetu, Ronke Grace^{1*} Anhange Samuel T¹. Ocheibi, V.A²

1.Department of Psychology, Benue State University, Makurdi

2.Department of Curriculum and Teaching, Benue State University, Makurdi

E-mail of the corresponding author: graceawopetu@bsum.edu.ng; awopeturonke@gmail.com

Abstract

This study investigated the perceived influence of information and communication technology on clinical service delivery among caregivers and patients in Makurdi metropolis. The study employed a survey method where two hundred and thirty two (232) participants consisting of 144(62.2%) males and 88 (37.9%) females with ages ranging from 16-58 years participated in the study. A questionnaire consisting of two sections was used to collect data from the participants. Findings from the hypotheses indicated that, there was a negative correlation between ICT usage in clinical service delivery and disease diagnosis in Makurdi metropolis $r(230df) = -.001$, $P > .05$ one-tailed. There was a negative correlation between ICT usage in clinical service delivery and disease prognosis in Makurdi metropolis $r(229df) = -.023$, $P > .05$ one-tailed. There was a negative correlation between ICT usage in clinical service delivery in reducing the severity of errors in disease diagnosis and prognosis in Makurdi metropolis $r(229df) = .042$, $P > .05$ one-tailed. There was a negative correlation between ICT usage in clinical service delivery in improving the quality and speed of clinical service delivery in Makurdi metropolis $r(229df) = -.030$, $P > .05$ one-tailed. These findings were discussed within the framework of ICT in Nigeria bearing in mind its influence on the general population. The study recommended that government and private practitioners should train their staff on ICT usage and not to lay them off. The study also recommended that more researches should be conducted in the study area for further identification of the long term solution of problems of ICT usage using larger sample sizes. On policy basis, it was therefore recommended that government should support the development of ICT in Nigerian hospitals with a separate remit and budget from the health ministry.

Keywords: Information and communication technology, clinical service delivery, caregiver, patients, Makurdi metropolis.

1. Introduction

The impact of Information and Communication Technology (ICT) on clinical service delivery among caregivers and patients has been of interest in recent years. Part of the reason for this renewed interest is that information and communication technology has now been recognized as the most rapidly growing segment of the world's economy (Idowu, Conford & Bastin, 2008). The development in this sector permeates every human activity viz; social, economic, cultural, religious, political and healthcare.

Feliciani (2003), observed that the huge networking possibilities afforded by ICT has significantly transformed the health care systems in the world dispersing healthcare information with comparative ease, bringing patients closer to caregivers, making access to the best health care technology and expertise available to the remotest parts of the world. Information and Communication Technology is a tool for gathering, storing, retrieving, processing, analyzing and disseminating information electronically.

According to Remlex (2007), information and communication technology has helped in poverty reduction by driving down healthcare costs. ICT has been employed as a tool for advocacy, awareness-building and education for preventing the transmission of infectious diseases as well as facilitating support groups, and counseling. ICT starts with the traditional cable telephones, radio and television to the advanced ones like computers and laptops, digital and camera phones, e-mail and websites, handheld devices, DVD and Mp3 players, video conferences, ipads, and so on. O'carrol, Yasnoff, Ward, Ripp and Martin (2007) have indicated that ICT has improved the delivery and effectiveness of health care services through help in disease management, improved patient safety and decision support for practitioners.

The production of quality health care delivery in a country is guided by the level of the ICT infrastructure therefore is a condition for enhancing the well-being of a country. Gates (1999) reported that intra- and inter-organizational networks in some advanced countries function like a digital neural system of the organization. Thus, he said, communication for health purposes has shifted from the largely manual documentary method to digital communication. According to him, while examining a patient, a medical doctor might be able to send an electronic X-ray of a patient to a leading expert in another country who could readily interpret and prove more details of the disease or condition, as well as send feedback to the medical doctor all within a few

minutes.

Eysenbach and Wyatt (2002) stated that medical caregivers in their research and application processes can use the internet to identify research issues, search literature databases, seek out information on surveys and clinical trials, and publish research results. On their part, Idowu, Ogunbodede and Idowu (2003) reported that while ICT capabilities were available in Nigerian teaching hospitals, mobile phones were spreading fastest.

Adeyemi and Ayegboyan (2004) in a survey involving four general hospitals, ten primary healthcare centres and six private hospitals in Nigeria reported that none of the institutions have e-mail access or a website, only 5% of the workers possessed personal computers, only 7% of the health care workers were computer literate, 20% had any measurable computer skills, and just 65% had access to a mobile phone, but not necessarily their own. This was in spite of the fact that Lagos State has the largest concentration of internet service providers, telecom operators, and cyber cafes, intended to create a reasonable platform for ICT use.

Similarly, Braa, Macome, Mavimbe and Jose (2001) surveyed on actual and potential usage of ICT at the district and provincial levels in Mozambique with a focus on the health sector. The National health information system of Mozambique was said to be among the very first computer applications in the provinces. The study further indicated that while it was still rare to use application software developed in order to address particular needs, the health sector was a fore-runner with such an innovation.

Another study by Academy for Educational Development Satellite (2009) to determine the extent of use health net by health workers revealed that health net was used by 1,950 health care workers in more than 150 countries worldwide, and that the development impact of health net had been most prevalent in Africa, where the model has contributed to increased rural and urban connectivity, capacity building, increase demand for ICT services, and in some cases, commercially viable ICT service enterprise. The study concluded that many physicians in developing countries relied on health net as their sole source of information in the treatment of AIDS and tropical disease, essential drugs, pediatrics, and public health promotion.

Taylor and Lee's (2005) study on occupational therapists' use of ICT in Western Australia revealed that e-mail and the personal computer were the most, frequently used ICT-enabled services. Furthermore, regarding competency level as good or better, competence was rated lower for web searching (48.5%) and searching for electronic articles (29.8%). Approximately, one third of respondents were dissatisfied with the level of technical support available to them, and only 38.4%, the therapists had participated in basic computer training provided by their current employer. Rural therapists had less access to a computer in their work environment in comparison to their metropolitan peers but proportionately used e-mail, teleconferencing, and video conferencing more frequently than their metropolitan counterparts.

The use of ICT in health sector reduces the cost of running hospitals (Remlex, 2007). ICT introduces potential of sharing of patients files easily without any threat to patients' privacy. It is used for hospital management such as admission and appointment management. ICT assists the patients to locate the health facility and personnel, gives 24 hour access to health information and through encryption and password protection can help to keep patients' data confidential. Against this background, the study aims at investigating the influence of information and communication technology on clinical service delivery among caregivers and patients in Makurdi metropolis.

2. Method

2.1. Design

The study employed a cross-sectional survey design to investigate the influence of Information and Communication Technology on clinical service delivery among caregivers and patients in Makurdi metropolis.

2.2. Participants

The participants were two hundred and thirty two (232) respondents drawn from medical personnel, medical students, government workers, military and paramilitary personnel, schools and religious institutions consisting of 144 (62.1%) males and 88 (37.9%) females. Their ages ranged from 16 to 58 years. As for their religion, 211 (90.9%) were Christians, while 21 (9.1%) Muslims. In terms of the respondents' ICT awareness level, 102 (44%) had high, 116 (50%) average and 13 (5.6%) had low.

2.3. Measures/Instruments

The instrument for the study was a 45-item questionnaire designed in accordance with Likert (1932) guidelines for attitude measurement. A pilot study was carried out to establish the reliability and validity level of the questionnaire. The reliability coefficient of the instrument was arrived at .86 Cronbach's alpha. The questionnaire was divided into two sections. Section 'A' was demographic information, while section 'B' was meant to gather opinions on how the respondents feel ICT can play a significant role in disease diagnostics, prognosis, reducing the severity of medical errors as well as improving the quality and speed of medical service delivery. In scoring the instrument, positive items were scored in descending order that is strongly agreed 4; agreed 3; disagreed 2; and strongly disagreed 1; while negative items were scored in ascending order that is strongly agreed 1; agreed 2; disagreed 3; and strongly disagreed 4. Both positive and negative questions were spread together to ensure effective responses from participants.

2.4. Procedure

A copy of questionnaire was given to each of the respondents in their offices, schools and points of duty. Compliance with the code of ethics of the military, paramilitary, civil servants, schools and religious institutions as well as confidentiality of the participants' responses and strict adherence to individual privacy were assured. All the participants who were available within the duration of data collection and willing to participate were administered the questionnaire. All completed questionnaires were collected on the spot while those not completed were collected on a later date. A total of 250 questionnaires were administered but only 232 were returned.

3. Results

The first hypothesis predicted that ICT usage will have a significant influence in disease diagnosis in Makurdi metropolis.

Table 1: Summary of correlation scores showing the influence of ICT usage on disease diagnosis.

Variables	N	r	df	P	Remark
ICT awareness level	232	-.001	230	.982	N.S
Disease diagnosis					

Table one above shows that the hypothesis was rejected $r(230\text{ df}) = -.001, p > .05$, one-tailed. This hypothesis implied that there is a negative correlation between ICT usage in clinical service delivery and disease diagnosis in Makurdi metropolis. By this, we can conclude that ICT is rarely used in any disease diagnosis in Makurdi metropolis.

Hypothesis two stated that ICT usage will have a significant influence in disease prognosis in Makurdi metropolis.

Table 2: Summary of correlation scores showing how ICT usage will have a significant influence in disease prognosis.

Variable	N	r	df	p	Remark
ICT awareness level	231	-.023	229	.735	N.S
Disease prognosis					

The result from table two above indicated that the hypothesis was rejected $r(229\text{ df}) = -.023, P > .05$ one-tailed. This implied that there is a negative correlation between ICT usage in clinical service delivery and disease prognosis in Makurdi metropolis. By this we can conclude that ICT is hardly employed in any disease prognosis in Makurdi metropolis.

Hypothesis three stated that ICT usage will have a significant influence in reducing the severity of medical errors in disease diagnosis and prognosis in Makurdi metropolis.

Table 3: Summary of correlation scores showing the influence of ICT usage in reducing the severity of medical errors in disease diagnosis and prognosis in Makurdi metropolis

Variable	N	r	df	p	Remark
ICT awareness level	231	.042	229	.534	N.S
Medical error					

Table three above shows that the result of the hypothesis was rejected $r(229\text{ df}) = .042, P > .05$ one-tailed. This implied that there is a negative correlation between ICT usage in clinical service delivery in reducing the severity of errors in disease diagnosis and prognosis in Makurdi metropolis. By this, we can conclude that ICT did not play much role in reducing the severity of medical errors in disease diagnosis and prognosis in Makurdi metropolis.

Hypothesis four stated that there will be a significant influence of ICT usage in improving the quality and speed of clinical service delivery.

Table 4: Summary of correlation scores showing the influence of ICT usage in improving the quality and speed of clinical service delivery.

Variable	N	r	df	P	Remark
ICT awareness level	231	-.031	229	.648	N.S
Improved quality and speed in medical service delivery					

The result from table four above indicated that the hypothesis was rejected $r(229\text{ df}) = -.030, P > .05$ one-tailed. This implied that there is a negative correlation between ICT usage in clinical service delivery in improving the

quality and speed of clinical service delivery in Makurdi metropolis. By this, we can therefore conclude that ICT is not used in improving the quality and speed of clinical service delivery in Makurdi metropolis.

4. Discussion

The first hypothesis which stated that ICT usage will have a significant influence in disease diagnosis in Makurdi metropolis was statistically insignificant. This finding negates the hypothesis because most hospitals in Makurdi metropolis hardly employ ICT in any of its clinical practices. This is not the case in America where for example, while examining a patient, a medical doctor might be able to send an electronic X-ray of a patient to a leading expert in another country who readily interpret and provide more details of the disease or condition, as well as send feedback to the medical doctor all within a few minutes. The findings in Makurdi metropolis also goes contrary to the Indian Health care project in Rajasthan and neighboring Asia whom in order to improve the quality of their treatment, the village doctors in mountainous areas of Yunnan, China, use mobile telephones to provincial capital hospitals several miles away (Gates,1999).

The second hypothesis tested was that ICT usage will have a significant influence in diseases prognosis in Makurdi metropolis. Again, this hypothesis proved to be insignificant. This finding implied that ICT has little or no use in disease prognosis in Makurdi metropolis. This finding is opposite to what is obtainable in developed countries like America, Europe, Asia and even South Africa, where ICT is engaged in detecting the early onset and causes of life threatening diseases like cancer, tuberculosis, HIV/AIDS, malaria amongst others. This finding also negates those of O'carrol, Yasnoff, Ward, Ripp and Martin (2007) who reported that ICT has improved the delivery and effectiveness of health care services through help in disease management, improved patient safety and decision supports for practitioners.

The third hypothesis stated that ICT usage will have a significant influence in reducing the severity of errors in disease diagnosis and prognosis in Makurdi metropolis: Again, this hypothesis was statistically insignificant. This finding goes contrary to that of Eysenbach and Wyatt (2002) who reported that medical caregivers in their research and application processes can use the internet to identify research issues, search literature databases, seek out information on surveys and clinical trials and publish research results. This finding showed that a lot of errors and mistakes in diagnosis, prognosis, prescription, referrals, surgery amongst others, could be avoided if ICT tools were developed into medical services within Makurdi metropolis. Errors in disease diagnosis and prognosis have resulted to loss of lives. It has also resulted to non-compliance or adherence to treatment regimes since patients go through great ordeals when they are placed on a wrong treatment plan or poorly thought out surgery, chemotherapy radiotherapy or immunization.

Hypothesis four stated that there will be a significant influence of ICT usage in improving the quality and speed of clinical service delivery in Makurdi metropolis. This hypothesis was again rejected. This finding of course does not indicate any paradigm shift from the other hypotheses and by implication, does not present ICT as a veritable tool in the hands of clinicians useful in improving the quality and speed of clinical services delivery in Makurdi metropolis and Nigeria at large. ICT enables the fast and remote doctor-doctor and doctor-patient consultation as well as real time instructions and treatment through telemedicine. In addition, it enables electronic publishing of novel techniques in medicine, access to catalogues in medical databases, and development of expert system that can help with diagnosis and treatment, as well as increased and free access to health and medical information for patients (Idowu, Cronford & Bastin, 2008).

5. Implications towards the Society

These findings are instrumental to the society in several respects. In the first instance, there are several obstacles to the use and successful implementations of ICT in clinical service delivery in Makurdi metropolis and Nigeria at large. These problems stem from three factors namely; the masses, government and ICT infrastructures. ICT has benefited the health sector both in developed and developing nations, the benefits affects the hospital stake holders which include hospital management, health personnel and patients.

The use of ICT in the health sector (Remlex, 2007), for example, the NHS in UK has its own name known as NHS net which has benefited all parts of NHS. Apart from data networking and internet, the NHS spends millions of pounds each year on telephone services across England to aid patient transport services and emergency ambulance because the two areas help the NHS to deliver good health care facilities. This is a far cry from what is obtainable in Nigeria since apart from University College Hospital Ibadan and Abuja National Hospital, no Teaching Hospitals or Medical Centers have Websites (Idowu, Cronford & Bastin, 2008).

In this regard, the Nigerian government should support the usage of ICT in health care delivery system by establishing an agency that will see to the development of ICT in a separate remit and budget from the health ministry. This should aim to ease delivery of health care by allowing staff and patients' records to be kept in a database and accessed online.

Furthermore, Nigerian government should encourage research institutes to become actively involved in software development and identification of best practice from other countries, particularly extensive open source

applications that could be developed in clinical service practice.

Finally, in order to use ICT in Nigerian hospitals, government and private practitioners should train hospital staff on how to use ICT and not lay them off and employ those with ICT skills.

References

- Academy for Educational Development SATELLIT. (2009). ICT for health: Empowering Health Workers to save lives. <http://www.healthnet.org> Accessed on August 18, 2013.
- Adeyemi, A. & Ayegboyin, M. (2004). A study on the use of information systems to prevent HIV/AIDS in Lagos State, Nigeria. Paper presentation at Informedica: Information and communication Technologies in Healthcare Development, 3rd Virtual Congress in Internet.
- Braa, J., Macome, E., Mavimbe C. & Jose, B.(2001). A study of the actual and potential usage of information and communication technology at district and provincial levels in Mozambique with a focus on the health sector. *The Electronic Journal on information system in developing countries*, 5, 1-29.
- Eysenbach, G. & Wyatt, J. (2002). Using the Internet for Surveys and Health Research. *Journal of Medical Internet Research*, 4(2), 8-13.
- Felicianic, F. (2003). Medical care from speed: Telemedicine, *ESA Bulletin*.
- Gates, W.H. (1999). *Business at the speed of thought*. New York: Warner Books.
- Idowu, P., Conford, D. & Bastin, L. (2008). Health informatics development in the Nigeria. *Journal of health Informatics in developing countries*, 5 (1), 70-75.
- Idowu, P., Ogunbodede, E. & Idowu, B. (2003). Information and Communication Technology in Nigeria. *Journal of Information of technology Impact*, 3, 69-76.
- O, Carrol, P.W., Yasnoff, W.A., Ward, M. E., Ripp, L .H. & Martin, E.L. (2007). *Public health informatic and information systems*, Springer.
- Remlex, D. (2007). Information and communication in chronic disease care. *Medical care Research and Review*, 64(2), 123-147.
- Taylor, R. & Lee, H.C. (2005). Occupational therapists, perception of usage of information and communication technology in western Australia and the association of availability of ICT on recruitment and retention of therapists working in rural areas. *Australian Occupation Therapy*, 52, 51-56.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
<http://www.iiste.org>

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: <http://www.iiste.org/journals/> All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: <http://www.iiste.org/book/>

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar

