



THE INFLUENCE OF INFORMATION AND COMMUNICATION TECHNOLOGY ON HEALTH SERVICE DELIVERY AMONG HEALTH WORKERS IN ADO LOCAL GOVERNMENT AREA OF EKITI STATE.

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ABSTRACT

Health ICT facilitates moving from decentralized and institution-based towards more global data storage. However, it was observed by the researcher that the influence of ICT in patient care delivery by health workers and the use of ICT for effective delivery and management of medical information is still shallow in the Ado local government of Ekiti State, thereby making their work and output more complicated to achieve. On this note, the researcher assessed the influence of ICT on health service delivery among health workers in the Ado local government area of Ekiti State. The study used the survey design of the descriptive research type. A sample size of two hundred (200) health personnel in government health facilities was used for the study. The simple random sampling technique was used. The split-half reliability method was used to ascertain the instrument's reliability using Cronbach's Alpha. A coefficient of 0.87 was obtained. The data gathered from the administered questionnaire was analyzed using inferential statistics of Analysis of Variance (ANOVA), Pearson Product Moment Correlation (PPMC) and Multiple Regression to test the hypotheses at 0.05 level of significance. It was deduced from the study revealed that there was a significant influence of ICT usage on better treatment decisions, higher quality and safer care towards patient care delivery; the study concluded that there was a meaningful relationship between ICT and effective, efficient and equitable health system and; management of medical information between the patient and health service provider. It was therefore recommended that health professionals pay more attention to the use of ICT resources for the health care delivery system as this will help achieve an effective, efficient and equitable health service system and enhance the reduction in time used in attending to patients in the hospitals. Health-related computer software and applications that health workers can assess should be incorporated into the Nigerian health sector. It will make health service delivery easy by reaching out to patients nationwide without physical contact.



Keywords: ICT, Health Workers, Health Service Delivery, Electronic Health Records

INTRODUCTION

Delivering healthcare directly results from the inputs into the health system, including healthcare workers, purchasing and funding, and supplies. Service delivery can be better, and access to services should be facilitated through increased inputs. To coordinate and harmonize a group of one or more people or entities to achieve a goal entails healthcare being on top of that group. Healthcare often encompasses the deployment and manipulation of human resources, financial resources, technological resources, and natural resources (Sampada & Kulkarni, 2010). The One of the biggest industries is health care information-consuming sectors. As a result, access to up-to-date and timely information by health professionals remains a sine qua non for proper diagnosis, prevention and treatment of diseases. Readily available information that affects the well-being of patients is always critical and over the last decade, the advent of Information and Communication Technologies (ICTs) has contributed immensely to continuous learning, sharing and dissemination of health information among professionals (Afolayan & Oyekunle, 2014).

Information Communication Technologies (ICT) such as electronic health records, e-prescribing, decision support systems, electronic management of chronic disease and barcoding of drugs and biological products have been shown to reduce healthcare costs and medical errors. Electronic prescribing has been shown to reduce errors and improve compliance with managed care formularies (Galanteer, 2005; cited by Cholo et al., 2015). Information Communication and Technology (ICT) knowledge enables healthcare providers to enhance patient care delivery, as well as the practice and safety of care (Newbold et al., 2005). Knowing the skill levels of the health care providers would establish the competency levels and hence form a basis for developing the desired skills. Until recently, ICT products available for healthcare providers were mostly designed for large organizations and were costly. Recent advances in technology have made ICT applications more available to primary care physicians in smaller practices (Cholo et al., 2015).



Healthcare providers all over the world are expected to keep pace with ICT developments to help them make informed decisions regarding patient care and management because a user's attitude toward the whole phenomenon of ICT affects their willingness to use computers -and hence an organization's ability to move toward a paperless system - it's essential to establish the existing attitude of health care providers to determine how computerization will be. Information and communication technologies (ICTs) have developed into an essential infrastructure component that might help retain healthcare providers in remote rural areas (Mbenba et al., 2013). Although extensive research has been done on additional factors that affect the retention of health professionals in rural locations, such as wage increases, quality housing, and others, little attention has been put into exploring the impact of ICT use on health worker retention in rural and distant regions (Woodward et al., 2014). It is stated that healthcare professionals are adopting e-Health innovations to solve this problem of rural health workers' isolation by using information and communication technology (Woodward et al., 2014). Benefits of ICT, such as online clarification of doubt, an opportunity to share knowledge, access to education, assistance with diverse decision-making processes and methods, expanded access to specialized tools, and access to information, have a positive influence on health workers retention in rural and remote areas (Woodward et al., 2014). In addition, reports indicate that specific ICT interventions such as Referral, teleconsultation, electronic medical records and the use of mobile phones have significant benefits or healthcare providers in remote and rural locations (Blaya et al., 2010).

Information Communication Technology (ICT) has the ability to enhance the effectiveness, safety, and efficacy of medical care. Delivering quality health care requires providers and patients to integrate complex information from many different sources. Increasing the ability of physicians, nurses, clinical technicians, and others to readily access and use the right information about their patients should improve care. The ability of patients to obtain information to better manage their condition and to communicate with the health system can also improve the efficiency and quality of care (Sampani & Kulkarni, 2010). ICT allows healthcare providers to collect, store, retrieve, and transfer information electronically. To capture the role of informal interactions in the process of knowledge diffusion, physicians rely on the recommendations of colleagues with whom they interact on



a day-to-day basis. Colleague recommendations are helpful because they can link specific treatments to the clinical needs of particular patients under a physician's care, but these recommendations are not sufficient to resolve the problem of information overload (Sampani & Kulkarni, 2010).

Idowu et al. (2003) stated that most of the health institutions in Nigeria are battling with some identified barriers, such as the high cost of ICT equipment, power failures, and inadequate telecommunication facilities. Unless these challenges are promptly attended to, the benefits of ICTs may not be realizable both in the short and long run. In essence, the myriad of problems in the health sector may not be totally eliminated by merely acquiring these technologies but by harnessing the technologies for development.

In Ekiti state, most of the healthcare providers lacked the necessary skills and knowledge to facilitate them to effectively and efficiently offer healthcare services through ICT facilities. After all, physicians making recommendations have limits on their own cognitive abilities and these 'limits will 'generally make it hard for them to keep abreast of all the newest procedures. For this reason, physicians will also have to devote time to independent reading in medical journals. Reading journal articles may expose the physician to the newest innovations, but journal articles do not identify for physicians the specific patients for which the innovation applies.

Statement of the Problem

Health ICT facilitates moving from decentralized and institution-based towards more global data storage. Having national health records can improve healthcare processes as different providers can access the same information fast; for example, the duplication of tests could be prevented. The researcher observed that the European Union's ultimate objective is to establish a long-term use system where all the clinicians in Europe can access health records from all countries. This would improve conditions for treatment as both the patient and the healthcare professional mobility is expected to increase. With electronic documents and communication technologies, having vast databases is practically possible. However, it was observed by the researcher that the influence of ICT in patient care delivery by health workers' use of ICT for effective delivery and management of medical information is still shallow in Ado local government of Ekiti State, thereby making their work and output more complicated to achieve. On this note, the researcher assessed the influence of



information and communication technology on health service delivery among health workers in the Ado local government area of Ekiti State.

RESEARCH QUESTIONS

The following questions were raised for the study:

1. Will utilization of ICT influence patient care delivery (higher quality and safer care) in Ado local government area of Ekiti State?
2. Will utilization of ICT influence effective, efficient and equitable health system in Ado local government area of Ekiti State?
3. Will utilization of ICT influence management of medical information between the service provider and health care consumer in Ado local government area of Ekiti State?

HYPOTHESES

The following null hypotheses are formulated for the study.

1. There is no significant influence of utilization of ICT on patient care delivery in Ado local government area of Ekiti State.
2. There is no significant relationship between utilization of ICT and effective, efficient and equitable health system in Ado local government area of Ekiti State.
3. There is no significant relationship between utilization of ICT and management of medical information between the service provider and health care consumer in Ado local government area of Ekiti State.

Design of the Study

The descriptive type of survey research was used for the study. This was because data collection was done in a well-structured process. The sole purpose of descriptive research is to provide an accurate and valid representation of the factors or variables that pertain to or are relevant to the research questions. The reason why this design was chosen for the study is because it was deemed appropriate. It enhanced the amount of quality information yielded.

Population of the Study

The study population consisted of every health worker in public health centres, clinics and hospitals in Ado Local Government Area of Ekiti State. Three hundred and seventy-eight (378) certified government health workers were in the study area (Ministry of



Health, 2021). Both males and females were considered the target population regarding the study. The survey was carried out using a specific number of participants in the sample. Two hundred respondents were used for the analysis. The respondents were healthcare personnel in the Ado local government area of Ekiti State. There are fifteen (15) health centres in the Ado local government area located in Ekiti State., with one (1) general hospital and one (1) University teaching hospital. To choose, we used a primary method of random sampling. Seven (7) health centres out of the fifteen (15) in the local government area. The researcher utilized the simple random sampling technique to choose our sample respondents based on the population of health personnel from each health centre selected for the study.

Procedure

The study utilized a research instrument of a self-structured closed-ended questionnaire designed by the researcher. The questionnaire used for taking the respondents' responses was 43 items instrument designed in line with the research questions and hypotheses formulated for testing. With each variable generating four optional items, the questionnaire used a Yes or No format for the respondent's responses. The questionnaire was divided into two sections. Section A was designed to collect socio-demographic information about the respondents, such as age, gender, class etc.

In contrast, section B was designed with thirty-eight (38) items in line with the study's research questions. Three (3) experts in health education in the Department of Human Kinetics and Health Education, Bamidele Olumilua University of Education, Science and Technology Ikere Ekiti, Nigeria, validated the instrument to establish face and content validity. Twenty (20) respondents who did not form part of the study sample were used for a pilot study. Two data sets were created from the information.split. The data collected were analyzed using Pearson's Product Moment Correlation (PPMC) and Spearman Brown's formular. The coefficient (r) obtained was 0.87.

The completed questionnaire by respondents was gathered and analyzed using descriptive and inferential statistics. The analysis was divided into two sections which are sections A and B. The descriptive statistics of frequency counts and the simple percentage were used in section A to answer the respondents' demographic data and research questions of the study. In contrast, in section B, inferential statistics of Analysis of Variance,



Multiple Regression and Pearson's Product Moment Correlation (PPMC) were used to test the hypotheses postulated at 0.05 level of significance.

Results

Descriptive Analysis

Table 1

Analysis of Respondents' Demographic Information

Demographic Variable	Groupings	Frequency	Percentage
Gender	Male	54	27.0
	Female	146	73.0
Age in years	20-25	24	12.0
	26-30	21	10.5
	31-35	13	6.5
	36-40	82	41.0
	41-45	59	29.5
	46 and above	1	0.5
Years of experience	0-5	68	34.0
	6-10	107	53.5
	11-15	22	11.0
	20-25	3	1.5
Religion	Christianity	191	95.5
	Muslim	9	4.5

Table 1 presents the demographic characteristics of the respondents. The result shows that 54 respondents representing 27% of the total sample were male while 146 (73%) were female. More than one-third (n=82, 41%) of the study participants, representing the majority were aged 36-40 years, 24 (12%) were within 20-25 years age bracket, 21 (10.5%) were aged 26-30 years, 13 (6.5%) were aged 31-35 years, 59 (29.5%) were within 41-45 years range while 1 (0.5%) were 46 years and above. The result further shows that more than half (n=107, 53.5%) had between 6-10 years working experience, 68 (34%) had 0-5 years of experience while 22 (11%) and 3 (1.5%) indicated 11-15 years and 20-25 years



working experience respectively. Majority of respondents (n=191; 95.5%) were Christians while 9 (4.5%) were Muslims.

Research Question 1

Will utilization of ICT influence patient care delivery (higher quality and safer care) in Ado Local Government of Ekiti State?

Table 2

Utilization of ICT influence on patient care delivery (higher quality and safer care)

S /N	Items	Yes		No		Me an
		N	%	N	%	
3	Does the use of patient monitor promote quality care of patients?	26	63.0	15	37.0	1.63
3	Does the utilization of television for external output for patients to view their state of condition influence quality of care?	9	21.5	41	78.5	1.40
3	Does the use of electrocardiograph machine help in promoting the cardiovascular appraisal of patients?	7	17.5	33	82.5	1.35
3	Does the use of autoclave improve service quality in sterilizing of medical equipment's for next utilization for further usage?	14	35.0	26	65.0	1.57
3	Does the utilization of defibrillator helps in quick resuscitation of patients in emergency situations towards effective health care delivery system?	17	42.5	23	57.5	1.59

Table 2 presents the influence of ICT utilization on patient care delivery (higher quality and safer care) in Ado Local Government of Ekiti State. The result shows that 126 (63%) respondents agreed that the use of patient monitor promote quality care of patients while 74 (37%) disagreed. On whether the utilization of television for external output for patients to view their state of condition influence quality of care, 79 (39.5%) respondents agreed while 121 (60.5%) disagreed. 70 (35%) respondents agreed that the use



of electrocardiograph machine help in promoting the cardiovascular appraisal of patients while 130 (65%) disagreed. 114 (57%) of the study participants agreed that the use of autoclave improve service quality in sterilizing of medical equipment's for next utilization for further usage while 86 (43%) disagreed. 117 (58.5%) respondents agreed that the utilization of defibrillator helps in quick resuscitation of patients in emergency situations towards effective health care delivery system while 83 (41.5%) disagreed. Using a cut-off mean score of 1.50 for the rating scale, all the items had mean scores above the cut-off point except items 33 and 34. This implies that utilization of ICT will influence patient care delivery (higher quality and safer care) in Ado Local Government of Ekiti State.

Question 2

Will utilization of ICT influence effective, efficient and equitable health system in Ado Local Government Area of Ekiti State?

Table 3

Utilization of ICT influence effective, efficient and equitable health system

S /N	Items	Yes		No		Me an
		N	%	N	%	
37	Does the utilization of computer helps in efficient record keeping of patients record in health care delivery system?	22	1.0	8	9.0	1.61
38	Does the use of diagnostic ultrasounds help in real imaging of internal organs of patients for efficient health care delivery system?	25	2.5	5	7.5	1.62
39	Does the use of internet help in searching for more information on illness of patients for better consideration of treatment for patients?	05	2.5	5	7.5	1.53
40	Does the use of electronic management system help in efficient health care delivery in your health facility?	6	8.0	04	2.0	1.48

Table 3 presents the influence of ICT utilization on effective, efficient and equitable health system in Ado Local Government Area of Ekiti State. The result shows that 122 (61%)



respondents agreed that the utilization of computer helps in efficient record keeping of patients record in health care delivery system while 78 (39%) disagreed. On whether the use of diagnostic ultrasounds help in real imaging of internal organs of patients for efficient health care delivery system, 125 (62.5%) respondents agreed while 75 (37.5%) disagreed. 105 (52.5%) respondents agreed that the use of internet help in searching for more information on illness of patients for better consideration of treatment for patients while 95 (47.5%) disagreed. 96 (48%) of the study participants agreed that the use of electronic management system help in efficient health care delivery in your health facility while 104 (54%) disagreed. Using a cut-off mean score of 1.50 for the rating scale, all the items had mean scores above the cut-off point except item 40. This implies that utilization of ICT will influence effective, efficient and equitable health system in Ado Local Government Area of Ekiti State.

Question 3

Will utilization of ICT influence management of medical information between the service provider and health care consumer in Ado Local Government of Ekiti State?

Table 4

Utilization of ICT influence management of medical information between the service provider and health care consumer

S /N	Items	Yes		No		Me
		N	%	N	%	
41	Does the utilization of tablet (Ipad) for storing and sharing patient health information promote privacy of patient's health information between health personnel's?	36	8.0	4	2.0	1.68
42	Does the use of computer for record keeping helps in easy reach of patient's information in the health facility?	29	4.5	1	5.5	1.64
43	Does the utilization of electronic management system promote easy sharing of patient information within and outside the health facility?	20	1.0	8	9.0	1.51



Table 4 presents the influence of ICT utilization on the management of medical information between the service provider and health care consumer in Ado Local Government of Ekiti State. The result clearly shows that 136 (68%) respondents agreed that the utilization of tablet (Ipad) for storing and sharing patient health information promote privacy of patients health information between health personnel's while 64 (32%) disagreed. On whether the use of computer for record keeping helps in easy reach of patients information in the health facility, 129 (64.5%) respondents agreed while 71(35.5%) disagreed. 102 (51%) respondents agreed that the utilization of electronic management system promote easy sharing of patient information within and outside the health facility while 98 (49%) disagreed. Using a cut-off mean score of 1.50 for the rating scale, all the items had mean scores above the cut-off point. This implies that utilization of ICT will influence management of medical information between the service provider and health care consumer.

Testing of Hypotheses

Hypothesis 1

There is no significant influence of utilization of ICT on patient care delivery in Ado Local Government Area of Ekiti State.

Table 5

Regression analysis showing the influence of ICT on patient care delivery (higher quality and safer care)

Model	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta(β)		
(Constant)	5.8	.402		14.21	.000
Utilization of ICT resources	.05	.012	.301	4.435	.000
Multiple R=0.301, Multiple R ² =0.090, Adjusted R ² =0.086, F _{1,198} =19.673					

*p<0.05



Table 5 showed that there is significant influence of utilization of ICT on patient care delivery (higher quality and safer care) in Ado Local Government Area of Ekiti State ($F_{1,198}=19.673$, $p<0.05$). The null hypothesis is rejected. The result shows that there is significant positive multiple correlation between the predictors variable (Utilization of ICT) and patient care delivery (higher quality and safer care) ($R=0.090$, $p<0.05$). This implies that the predictor variable is a factor that can exert influence on patient care delivery (higher quality and safer care). The coefficient of determination ($R^2=0.086$) indicated that the variable of utilization of ICT accounted for about 8.6% of the observed variance in patient care delivery while the remaining 91.4% unexplained variance can be attributed largely to other factors outside the regression model other than the utilization of ICT.

Hypothesis 2

There is no significant relationship between utilization of ICT and effective, efficient and equitable health system in Ado Local Government of Ekiti State.

Table 6

Pearson Correlation analysis of utilization of ICT and effective, efficient and equitable health system

Variable	N	Mean	SD	r	p
Utilization of ICT resources	200	31.09	9.20487	0.355*	0.000
Effective efficient and equitable health system	200	6.240	1.51787		

* $p<0.05$

Table 6 showed that the computed r-value (0.355) was significant at $p<0.05$ level of significance. The null hypothesis was rejected; implying that there was relationship between utilization of ICT and effective, efficient and equitable health system in Ado Local Government of Ekiti State. The relationship between utilization of ICT and effective, efficient and equitable health system in Ado Local Government of Ekiti State was low but statistically significant in a positive direction.

Hypothesis 3



There is no significant relationship between utilization of ICT and management of medical information between the service provider and health care consumers in Ado Local Government of Ekiti State.

Table 7

Pearson Correlation analysis of utilization of ICT and management of medical information between the service provider and health care consumers

Variable	N	Mean	SD	R	p
Utilization of ICT resources	200	31.10	9.20	0.376*	0.000
Management of medical information	200	4.84	1.20		

***p<0.05**

Table 7 showed that the computed r-value (0.376) was significant at $p<0.05$ level of significance. The null hypothesis is rejected; implying that there was relationship between utilization of ICT and management of medical information between the service provider and health care consumers in Ado Local Government of Ekiti State. The relationship between utilization of ICT and management of medical information between the service provider and health care consumers in Ado Local Government of Ekiti State was low but statistically significant in a positive direction.

Discussions

Hypothesis 1, which stated that there is no significant influence of utilization of ICT on patient care delivery (higher quality and safer care) in The Ado Local Government Area in Ekiti State., was rejected. The result shows that there were multiple positive correlations between the predictor variable (Utilization of ICT) and patient care delivery (higher quality and safer care) ($R=0.090$, $p<0.05$). The result of the findings was in line with the affirmation of Rodrigues (2014) that ICT resources have improved the level of patients' safety and outcome. ICT integrated system is critical to patients' diagnosis, and reducing medical errors has gone a long way in holistically improving the level and quality of healthcare outcomes and patients' safety.

In addition, Silvo (2013) confirmed that ICT supports medical professionals in achieving higher productivity and better accuracy in their critical tasks. It also allows



continuous monitoring of the health status of patients rather than episodic checks during ambulatory visits. Silvo (2013) reported the assertion of Chiron (2013) in his statement that ICT provides the collection and analysis of a large quantity of data related to the specific patient and to previous clinical studies (knowledge-based medicine). Thus, using ICT, health workers can monitor and administer drugs to their patients by checking their charts.

Hypothesis 2, which stated that there is no significant relationship between the utilization of ICT and effective, efficient and equitable health system in Ado Local Government of Ekiti State, was rejected, implying that there was a relationship between utilization of ICT and effective, efficient and equitable health system in Ado Local Government of Ekiti State. The result of the findings was supported by the assertion of Adeleke et al. (2014) that ICT has become the cornerstone upon which efficient and effective healthcare delivery thrives. Computer technology has a critical role in the transformation of healthcare services. ICT is helpful in data gathering and administering healthcare services and can improve the quality and reliability of healthcare data and services. In the same vein, Front Enders (2021), in their newsletter, stated that ICT in healthcare research helps find possible prevention measures to eradicate and reduce the spread of diseases. We can find new technology in diagnosis, which reduces the time and cost. This provides therapy in advance, saving the lives of numerous people. Through ICT, traditional healthcare systems can be eliminated and new models for efficient, high-quality care can be developed (Front, 2021).

Hypothesis 3, which stated that there is no significant relationship between utilization of ICT and management of medical information between the service provider and health care consumers in Ado Local Government of Ekiti State, was rejected, implying that there was a relationship between utilization of ICT and management of medical information between the service provider and health care consumers in Ado Local Government of Ekiti State. The result of the findings was in line with the assertion of While and Dewsbury (2011) that ICT use has the ability to advance patient-centred healthcare at a lower cost, enhance the quality of care and information sharing, inform both patients and health professionals, develop a new kind Regarding communication between patients and their medical professionals, cut down on travel time, and more. Concurrently, access to the Internet has also increased from 6.5% in 2000 to 43% in 2015. These new technologies, and access to



them, allow for health care to be provided in novel ways. For example, the use of Health tools and applications among CHWs has been increasing, particularly within resource-constrained health systems (Agarwal et al., 2015). This can have the potential to improve health behaviours and outcomes, such as increasing the use of primary and preventative health services, health-related data collection, medication adherence, and the timely delivery of disease test results.

CONCLUSIONS

According to the study's conclusions, it was concluded that ICT influenced better treatment decisions, higher quality and safer care towards patient care delivery; that ICT will influence effective, efficient and equitable health systems and that ICT will enhance the management of medical information between the patient and health service provider.

RECOMMENDATIONS

Based on the conclusions drawn for the study, the following recommendations were made:

1. Healthcare providers should be familiar with the utilization of ICT for effective health service delivery, as incompetency in the utilization of ICT could be a barrier to patient care delivery;
2. Medical experts should focus more on the use of ICT resources for the healthcare delivery system as this will help in achieving an effective, efficient and equitable health service system as well as enhance the reduction in time used in attending to patients in the hospitals and;
3. Health-based and related computer software and applications that health workers can assess should be incorporated into the Nigerian health sector. It will make health service delivery easy by contacting patients nationwide without physical contact..

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