

Assessment And Utilization Of Information And Communication Technology For Client Care Among Nurses In Primary Health Care Centers, Ile-Ife, Osun State

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Abstract

Background: Information and communication technology (ICT) is a globally utilized technology for acquiring information especially in the practice and management of patient care. This study evaluated the roles of ICT in client care services and enumerated the factors that affect efficient use of ICT among nurses in some selected primary health centres in Ile-Ife.

Methodology: Total Enumeration method was adopted in which eighty four copies of questionnaire were distributed among the nurses in tertiary, state, comprehensive and primary health centers in Ile-Ife, Osun State. Thereafter, 81 properly filled questionnaires were retrieved and transformed using Cronbach alpha. Reliability test was pre-conducted among community health nurses and ambiguous questions were paraphrased to suit the research objectives.

Results: Results showed that the primary healthcare centres use ICT facilities such as desktop computer (92.6%), smart phone (88.9%), ICT-enabled television (87.7%), and laptop computer (83.0%), respectively. The study also showed that 88.9% of the computers were used for keeping record of disease surveillance and 85.2% smart phone are utilized for patients care follow-up. Also 93.8, 88.8, 81.5, and 77.8% of the respondents had access to ICT-enabled television, desktop computer, smart phone and laptop computer, respectively. Ninety six percent of the respondents affirmed absence of projectors, 88.9% had difficulty in internet access while 82.7% had challenges in accessing printers and photocopiers. The study found a significant relationship ($p < 0.05$) between the factors influencing ICT and its utilization; socio-demographic variables and ICT utilisation, accessibility and utilization of ICT.

Conclusion: The study concludes that ICT is both available and accessible in the studied area however, poor internet connection, lack of projector, printers and photocopiers remain some of the major constraints. The study recommends adequate supply of ICT facilities and regular training of nurses on the use of ICT facilities.

Keywords: ICT, Nurses, client care, influencing factors

Date of Submission: 13-07-2020

Date of Acceptance: 28-07-2020

I. Introduction

Health care is considered an important pillar of the society, critical for effective response to public health emergencies, addressing diseases and ill health¹. The increasing need for cost and effective approach in dispensing healthcare services necessitate a radical change in the current healthcare systems. Part of which requires taking full advantage of modern technology such as ICT. ICT covers a wide range of scientific and technological innovations which have transformed virtually all aspects of human life including healthcare system². ICT is useful in healthcare services, artificial intelligence, retrieval of up-to-date information on different aspects of diseases, video-conferencing, to guide practice and manage patients for better outcome. ICT also provides free access to journals, textbooks, and current breakthroughs in medicine thereby improving learning and research. In addition, the use of ICT in health services ensures that doctors, nurses and other healthcare practitioners get the most useful information to guide them in making appropriate decisions about a patient's illness and treatment³.

Nurses, the largest healthcare workforce which also have a long working hour, are expected to have the adequate knowledge, skill and technical know-how of utilizing ICT to enhance their health care services.¹. Many nursing care themes are influenced by the use of ICTs, including time management, time spent on patient care, documentation time, information quality and access, quality of documentation, knowledge updating and utilization, nurse autonomy, intra and inter-professional collaboration, nurses' competencies and skills, nurse-patient relationships as well as assessment, care planning, and evaluation³. Unfortunately, despite the

increasing advances in modern information technology, the utilization of ICT in healthcare services is still very low⁴.

ICT also provides important tools that contribute to eHealth. The eHealth is a concept of utilizing ICT tools and services, such as social media and collaboration technologies, to offer innovative solutions that enhance health care service delivery. They provide more effective means of accessing, communicating and storing information in the health sector. Databases and other applications can help improve health system efficiencies and avoid errors. However, understanding how technology innovations can be effectively introduced in health systems and how these innovations will influence health outcomes is still a challenge⁵.

Primary Health Care being the first level of healthcare service provision has the main strategies of increasing health coverage and improving the health status of the people in the catchment area. Therefore, it is important to pay attention to health information in order to obtain real-time, integrated, and valid data concerning the communities in the catchment areas. ICT is largely absent from the way health workers generate, capture and share health information because of overreliance on handwritten paper records. Unlike the physical files that may get lost or are difficult to locate, information stored on computers is secure and easy to retrieve. The use of the internet helps healthcare workers to find useful information for successful diagnosis, treatment, and prevention of some diseases. They can use electronic health record system to access a patients' information and the care that have been given and make necessary adjustments as the need arises. The use of eHealth technologies empowers patients to be more responsible for their health and quality of life⁵.

Primary health care (PHC) is the backbone of the healthcare system and it has been singled out as the most suitable health care setting to meet the increasing need for health promotion interventions and to curb the rising number of chronic diseases. Majority of people depend on health care services for curative, preventive, restorative, and follow up care, yet PHC is poorly equipped to provide these services. Utilizing ICT in PHC could contribute to increased health literacy, empowerment, and improved recovery of patients⁶.

II. Methodology

2.1 Research Design

This study employed the descriptive, cross-sectional quantitative research design to determine the assessment and utilization of information, communication and technology in client care among nurses in primary health centers, Ile- Ife, Nigeria.

2.2 Sampling and Criteria

Eighty four community health nurses working at the community centres of tertiary, state, comprehensive and primary health centres in Ile-Ife were recruited for this study. Each respondent nurse must have spent over six months at the primary health centre, present at work, and the facility must have ICT. The exclusion criteria were nurses working on the wards, nurses on maternity leave, sick leave or leave of absence and facilities supervised by community health officers and community health extension workers and those health centers without ICT facilities.

2.3 Sample Size and Sampling Technique

Total Enumeration method was adopted due to sample size (84) at the community centres. Eighty Four copies of questionnaire were distributed among the nurses of the community centers of the tertiary hospital, the state hospital, the comprehensive health centers and all the primary health centers where nurses are found in Ile-Ife, Osun State. The respondents were selected as follows: Ife North (7), Ife North East (2), Ife North West (4), Ife Central (47), Ife East (16), Ife South (6) and Ife South West (2).

2.4 Instrumentation

The questionnaire was designed to consist of four parts: socio-demographic data, availability of ICT, utilization of ICT, and factors affecting the use of ICT by nurses.

2.5 Validity and Reliability of Instrument

Validity of the instrument was established via face and content validity techniques. Reliability test was conducted among ten community health nurses at Ita-Akogun, community health centre, Osogbo, with pre-designed questionnaires using Cronbach's Alpha reliability coefficient. The responses during the pre-testing was evaluated and ambiguous questions were rephrased for clarity to the research objectives.

2.6 Ethical Clearance

The ethical permit was obtained from Babcock University Health Research and Ethical Committee (BUHREC), as well as the letter of introduction from the Dean of School of Nursing, Babcock University. Permission was also obtained from the heads of nursing services at the selected health facilities. The individual

informed consent was also obtained following the approval protocol. The questionnaires were administered to the respondents and retrieved after the answers were properly filled.

2.7 Statistical Analysis

The data obtained were transformed using the statistical package for the social sciences software (SPSS, Version 23). Research questions were answered with descriptive statistics of frequency and percentages while hypothesis tested with chi square and multiple regression at 0.05 level of significance.

III. Results

3.1 Socio-demographic Characteristics of the Respondents

A total of eighty one copies of the questionnaire were retrieved from the respondents which represents 97% of the total number of the questionnaire administered. The details of the socio-demographic characteristics of the respondents are shown in Table 3.1. The result shows that 85.2% of the respondents were females while 14.8% were males. It was also observed that 27.2% of the respondents were in the 35-39 age group. Also 39.5% of the respondents were in the nursing officer II cadre while 33.3% already had 11-15 years of professional experience.

3.2 Utilization of ICT among Nurses in the Selected Primary Health Centers in Ile-Ife Osun State

The level of utilization of ICT facilities by the respondents is as shown in Table 3.2. The result shows that 92.6% of the respondents use desktop computer for keeping record of disease surveillance, 88.9% smart phone for patients care follow-up and appointment reminder, 87.7% ICT enabled television while 83% use laptop computer for patients care in the study areas.

Table 3.1: Socio-demographic characteristics of the respondents

Socio-Demographics Data	Frequency	Percent
Sex of Respondent		
Male	12	14.8
Female	69	85.2
Age of Respondent		
<20	1	1.2
20-24	9	11.1
25-29	17	21.0
30-34	17	21.0
35-39	22	27.2
40-44	8	9.9
Cadre/Position		
NO1	18	22.2
NO2	32	39.5
SNO	16	19.8
PNO	6	7.4
ACNO	6	7.4
CNO	3	3.7
Length of Service		
5 years or less	17	21.0
6-10 years	26	32.1
11 -15 years	27	33.3
Above 15 years	11	13.6

Table 3.2: Distribution of Respondents according to their Utilization of ICT in Health Centers

Variable	WU	%	NU	%
Desktop computer	75	(92.6)	6	(7.4)
ICT enabled television e. g smart t v	71	(87.7)	10	(12.3)
Laptop computer	68	(83)	13	(17)
Smart phone	72	(88.9)	9	(6.2)
Internet connectivity	17	(21)	64	(79)
Projector	19	(23.5)	62	(76.5)
ICT service (e. g printer & photocopier)	30	(37)	51	(63)

WU: Well utilized, NU: Not utilized, (%): Percentage

3.3 Level of Utilization of ICT for Patients’ Care

Table 3.3 shows the level of utilization of ICT by respondents for patients’ care. Results revealed that 97.5% of the respondents utilize computer for keeping record of disease surveillance, 92.6% utilize smart phone for patients care follow-up, 96.3% utilize smart phone for emergence response system, 88.9% utilize computer for conducting disease surveillance while 85.2% use smart phone for patient’s appointment reminder.

3.4 Factors Affecting the Use of ICT in Primary Health Centers in Ile-Ife Osun State

Table 3.4 shows factors influencing the use of ICT facilities by nurses. Results showed that 92.5% of the respondents were influenced by the availability of electricity and internet connection, 81.5% by computer repair and maintenance, 77.8% by support from health centers administrators and 76.5% by security of data stored on the computer.

Table 3.3: Level of utilization of ICT for patients’ care

Variable	C	SP	ICT	IC
	F (%)	F (%)	F (%)	F (%)
Providing health information to patients	28 (34.6)	27 (33.3)	22 (27.2)	4 (4.9)
Ascertaining the treatment compliance of patients	14 (17.3)	52 (64.2)	14 (17.3)	1 (1.2)
As appointment reminder to patients	11 (13.6)	69 (85.2)	1 (1.2)	0 (0)
Keeping patients records	71 (87.7)	9 (11.1)	0 (0)	0 (0)
Follow-up care for patients	6 (7.4)	75 (92.6)	0 (0)	0 (0)
Use in emergency response system	3 (3.7)	78 (96.3)	0 (0)	0 (0)
Providing health information to their colleagues	23 (28.4)	56 (69.1)	0 (0)	2 (2.5)
Building training for other health workers and students	34 (42.0)	29 (35.8)	7 (8.6)	11 (13.6)
Community mobilization	3 (3.7)	19 (23.5)	58 (71.6)	1 (1.2)
Awareness raising over health issues	4 (4.9)	7 (8.6)	70 (86.4)	0 (0)
Conducting health survey	58 (71.6)	15 (18.5)	7 (8.6)	0 (0)
Conducting disease surveillance	72 (88.9)	8 (9.9)	1 (1.2)	0 (0)
Keeping record of disease surveillance	79 (97.5)	2 (2.5)	0 (0)	0 (0)
Tracking commodities	1 (1.2)	60 (74.1)	19 (23.5)	1 (1.2)
Performing health education in the community	5 (6.2)	13 (16.0)	62 (76.5)	1 (1.2)

C- Computer; SP: Smart phone; ICT TV: enabled television; IC: Internet connectivity; F: Frequency;(%) Percentage; MV: Mean value; SD: Standard deviation

Table 3.4: Distribution of factors influencing ICT use

VARIABLE	A F (%)	OF f (%)	ST f (%)	R f (%)	N F (%)
Availability of computer training centers (Organisation factor)	43 (53.1)	14 (17.3)	17 (21.0)	7 (8.6)	0 (0)
Computer proficiency of nurses (Human factor)	33 (40.7)	16 (19.8)	16 (23.5)	13 (16.0)	0 (0)
Access to ICT services (Organisation factor)	2 (2.5)	60 (74.1)	19 (23.5)	0 (0)	0 (0)
Work experience in nursing (Human factor)	5 (6.2)	3 (3.7)	52 (64.2)	21 (25.9)	0 (0)
Support from health centers administrators (Organisation factor)	63 (77.8)	10 (12.3)	6 (7.4)	2 (2.5)	0 (0)
Commitment to the use of ICT services (Human factor)	4 (4.9)	48 (59.3)	19 (23.5)	10 (12.3)	0 (0)
Attributes of ICT facilities (Organisation factor)	10 (12.3)	0 (0)	61 (75.3)	10 (12.3)	0 (0)
Inadequate resources	39	21	20	1	0

(Organisation factor)	(48.1)	(25.9)	(24.7)	(1.2)	(0)
Security of data stored on the computer (Human factor)	62 (76.5)	12 (14.8)	7 (8.6)	0 (0)	0 (0)
Computer repair and maintenance (Organisation factor)	66 (81.5)	15 (18.5)	0 (0)	0 (0)	0 (0)
Availability of electricity and internet connection (Organisation factor)	75 (92.6)	6 (7.4)	0 (0)	0 (0)	0 (0)

A- Always, OF- Often, ST-Sometimes, R- Rarely, N- Never

3.5 Accessibility of ICT in Primary Health Centers in Ile-Ife

Table 3.5 showed access to ICT facilities for patients care. The results revealed that 93.8% of the respondents had access to ICT enabled television, 88.8% access to desktop computer, 81.5% access to smart phone while 77.8% had access to laptop computer.

Table 3.5: Access to ICT for Patients Care

VARIABLE	AA		NA	
	F	%	F	%
Desktop computer	72	(88.8)	9	(11.2)
ICT enabled television e. g smart t v	76	(93.8)	5	(6.2)
Laptop computer	63	(77.8)	18	(22.2)
Smart phone	66	(81.5)	15	(18.5)
Internet connectivity	9	(11.1)	72	(88.9)
Projector	3	(3.7)	78	(96.3)
ICT service e. g printer & photocopier	6	(7.4)	75	(92.6)

AA- Always accessible, NA- Not accessible F- Frequency

IV. Discussion

The use of information and communication technology in healthcare delivery has become a global trend⁷. It creates access, enhances quality, improves primary health care interventions and buffers the speed for effective delivery. This present study investigated the level of utilization of ICT in client care among nurses in primary health centers in Ile-Ife, Osun State. The study revealed that desktop computer, ICT enabled television, and laptop computer and smart phone are often utilized for patients care in the study area. However, projector, internet connectivity and other ICT services such as printers and photocopier were not being used for patient care. The results showed that greater percentage of the nurses make use of desktop computer for keeping record of disease surveillance and smart phones for patients care follow-up, emergence response system, and patient's appointment reminder. This finding is in disagreement with ⁷ who reported 47% of the respondents to have utilized computer for health care delivery, 21.4% for internet connectivity, and 39.9% for telephone in federal medical centre Yenagoa, Bayelsa.

However, our findings correlate with ⁸ who reported 77% of the participants to utilize telephone for health care (although about 11.9% lower than our findings), 89% to utilize computer, 100% aids in assembling health professionals during emergencies in South-South tertiary hospitals, Nigeria. However, 72% of the participants' affirmed the utilization of projector which negate the findings of this study. in a similar report ⁹, 64.8% of the respondents were provided with desktop computer, 10.8% laptop computer, while 82.8% reported absence of internet connectivity in Kenya; which also correlated with our findings. Although, various researchers reported different levels of ICT utilization, their reports are suggestive of the fact that, ICT facilities are indeed being utilized in various capacities to aid healthcare delivery.

Some of the major factors influencing the smooth use of ICT in primary healthcare facilities in Ile-Ife according to their order of impacts were poor electricity supply, internet connection, computer breakdown, poor maintenance culture, support from health centre administrators and security of data stored on the computer. This study also examined the availability of computer training centers, computer proficiency of nurses, access to ICT services, support from health center administrators, computer repair and maintenance among others in the study area. Earlier report ⁷ recorded internet connectivity (21.4%) in Yenegoa, Nigeria; while ⁹ reported lack of

computer repair and maintenance (97.8%), security of stored data (51.5%), and lack of internet connectivity (82.5%), in Kenya. Efforts were also made to determine the accessibility of ICT in client care among nurses. The results clearly showed that ICT enabled television, desktop computer, smart phone and laptop were all available at different centres visited however, and lack of projector, ICT services and poor internet connection remained a major challenge. In contrast, ⁹ reported lack of access to computer (58.2%), access to internet connection (82.8%) in Kenya. In another report, ¹⁰ reported access to mobile phones (30.2%), computer (26.4%), and internet connection (7.1%) among health workers. The results of the hypothesis revealed a significant relationship between socio-demographic variables and utilization of ICT services ($r = 0.224$, $p < 0.05$), which correlates with ¹¹ who reported a significant relationship between ownership of computer and ability to use word processor; and significant relationship between level of education and ability to search the internet. There was also a significant relationship between the factors influencing ICT and its utilization ($r = 0.317$, $p < 0.05$). Positive dispositions among the nurses towards the use of ICT have also been documented ¹².

V. Conclusion

In conclusion, ICT is both available and accessible in the studied area however, poor electricity supply, internet connection, computer breakdown, poor maintenance culture, poor supports from health centre administrators, lack of data security, projector, printers and photocopiers remain some of the major constraints.

VI. Recommendation

The study recommends adequate supply of ICT facilities and regular training programmes for nurses on the use of ICT facilities. The primary health centers in the study area should be connected to the internet to ensure quick access to relevant health information by nurses with provision of alternative power supply. Printers and photocopiers should be provided in each section of the health centers to facilitate access and utilization of health information.

Limitation of the study

The researcher encountered some challenges among these were reluctant of some of the respondents to fill the questionnaire. Also retrieval of questionnaires from the participants. However, these limitations did not affect the data collection and findings of the study.

Conflict of Interest

The authors wish to state that there is no conflict of interest.

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*Adesuyi A. B., et al. "Assessment And Utilization Of Information And Communication Technology For Client Care Among Nurses In Primary Health Care Centers, Ile-Ife, Osun State." *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 9(4), 2020, pp. 29-34.