Knowledge and Attitude towards Utilization of Information Technology for Nursing Care Delivery Among Nurses at Olabisi Onabanjo University Teaching Hospital, Sagamu Ogun State, Nigeria

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Abstract:- Information and Communication Technology (ICT) is pivotal for efficient delivery of nursing care service in both developed and developing nations. Generally, it's utilization depends on the knowledge and attitude of nurses. Hence, this study determined the knowledge and attitude towards utilization of information technology for nursing care delivery among nurses at Olabisi Onabanjo University Teaching Hospital (OOUTH), Ogun state, Nigeria.

A cross-sectional design was adopted and a sample of 147 consented nurses were proportionately selected in all the units/wards of OOUTH. About 126 questionnaire were retrieved and analyzed descriptively for frequency tables, percentage, chart, standard deviation and mean and hypothesis tested with regression at $p<0.05$.

Nurses were knowledgeable on IT in OOUTH. More so, the findings showed a positive significant relationship between IT knowledge and utilization of IT for delivery of nursing care among nurses in OOUTH. Nurses should be supply with IT gadgets likewise equip with more knowledge on the utilization of IT for effective delivery of nursing care to patients.

Word counts: 170

Keywords:- Information technology, Knowledge, Attitude, Utilization and Nurses.

I. INTRODUCTION

The world is evolving as the development of technology and communication advances, thereby contributing to the needs of people, group and society at large in various sectors. Information technology has a significant impact on all aspects of the society especially the health sector in the 21st century. Information technologies embody all digital technologies that support the electronic capture, storage, processing, and exchange of information in order to promote health, prevent illness, treat disease, manage chronic illness, and so on (Chan 2019).

In particular, health need is a paramount sector that generally requires improvement in the efficiency and effectiveness of delivering quality of health care services in meeting the needs of the citizenry. Since the health care system is the pillar that supports the growth and development of a nation, likewise the use of information technology has become a pivotal means of bridging the activities in health care organization to meet the health needs of people (Masic, & Ridjanovic 2012). Hence, information technology increasingly important aspect in health care organizations especially hospital healthcare services, therefore, its application in education, research and clinical practice are critical and essential. Although, the need is quite sequential in developing countries especially, Nigeria where many health needs are unmet due to manual way of working especially as regards the health information within the system and other healthcare services thus, delaying the output delivery of care, hospital waiting time and consequently leading to the increase morbidity and mortality.

Information and Communication Technology (ICT) is with the potential to improve the quality of health care delivery services as it could be effective and efficient in both the developed and developing nations. Apparently, information and communication technologies have drastically changed the face of the world we lived in (Jensen, 2018). It continues to rapidly advanced and incorporate in the health care needs of professionals and research fields including nursing. It is significant that nurses acquire competences to utilize information technology in their domain of practice to effectively meet the needs of patients (Friganovic, Jelec & Sukalic, 2017).

Information technology in nursing practice is the utilization and application of organized knowledge and skills in the form of devices, medicines, vaccines, procedures and systems developed to solve a health problem and improve quality of lives of patients (Mytton et al, 2013). The effect of global changes, especially, the arise of new diseases like Corona virus, Ebola virus, Lassa fever and so on, has led to the increase in embracing the information technologies in nursing practice, to combat with the new challenges (Howard, et al. 2017; WHO, 2021).

Nurses in everyday work encounter with the application of new gadgets, instruments, and other modern technologies used for patients' care (Nilsson & Erilsen 2014). The utilization of modern technology in nursing practices increases nurses' efficiency, but is also changing the way of care for patients (White, Dewsbury, Sicotte 2015; Thakur et al 2012). In Africa, the information technology is not being utilized or less utilized among Nurses. Only about 26% of nurses use modern technology in treating the patient and only a small percentage of the nurses demonstrated good knowledge of computers and IT, hence there is the suboptimal utilization of modern technology in nursing practice (Dye 2014; Eccles & Davis 2013).

In the same vein, the fact that nurses by virtue of their profession had better training opportunities in the use of new gadget did not translate into better knowledge and utilization habits (Grol, Wensing, & Eccles 2013). A study in the Eastern Cape province of South Africa, which is one of the poorest provinces in the country with vast rural areas (Thakur 2012). A modern technology system was implemented in the province in order to improve health care services, but despite large investments from the National Department of Health, only one third of the modern technologies in the province are operational (Kramer & walker 2017) Technological problems, such as unreliable electricity supply and low bandwidth, were identified as barriers to the successful implementation of modern technologies in South Africa, but these issues have since been addressed. Nevertheless, the uptake of modern technologies remains poor. Another study in Nigeria, the most populated nation in Africa, found that the knowledge of the health professionals on modern technology was poor, though majority of them were in support of the services (Olugbenga, Fichman & Kohli 2015). The use of new technology is still very low especially in developing countries, where most of them feel incompetent and uneasiness especially in the clinical area, post a major threat to the safety of patients, energy and time for patient and health providers, the survival of patients and safety of health-care workers.

II. STATEMENT OF THE PROBLEM

Despite the wide coverage of information technology in several establishments and its uses in both the developed and developing countries, is yet to be fully used in the health sector. It uses in health sector is still average especially in the developing and low-socioeconomic nations, where several studies have reported that IT use in medical and health are still low (While 2013). Information technology has greatly improved the health service delivery in advanced countries. It is also a known fact that computers and mobile phones use is generally common yet people in the hospitals still find it difficult to use. However, some have likewise identified factors as internet connectivity, electricity. In the study conducted by While 2013 found that only just 1.4% of the medical staff did not use the internet in any fashion, that majority (70.7%) using the internet only for e-mail. Generally, hospital is over-visited due to increasing burden of health care services to patients thus, increasing the severity of morbidity and mortality of people bearing the brunt of the pandemic are the Nurses at the front lines of patient care. The

use of information technology provides direct or indirect care to patients needs by nurses (Haddad & Butler 2020).

According to Data and Health information unit(2022) in Olabisi Onabanjo University Teaching hospital found that about two-thirds of nurses could not use electronics card to access patients data and prescription to deliver care services due to unavailability of technologies in some hospital units, lack of training and knowledge on the utilization of information technology (DHI 2022). However, majority prefer paper folder for better in understanding to deliver nursing care services through majority were using telecommunications but few know how to use computer system in accessing patients data. Though studies have reported the utilization of information to an extent but yet to fuse in the attitude and knowledge to its uses especially among nurses as expected in the teaching hospitals (DHI 2022). Thus, this study is assessing the Nurses' knowledge and attitude towards the utilization of information technology in the delivery of nursing care services.

III. OBJECTIVES OF THE STUDY

The main objective of the study is to assess the knowledge and attitude towards the utilization of information technology in the delivery of nursing care among Nurses at Olabisi Onabanjo University Teaching hospital(OOUTH) Ogun State, Nigeria.

The Specific Objectives are to;
- assess the level of knowledge of Nurses on information technology for nursing care delivery at Olabisi Onabanjo University Teaching hospital, Sagamu, Ogun state.
- determine the attitude of nurses towards information technology for nursing care delivery at OOUTH, Sagamu.
- determine the utilization of Information technology among Nurses in nursing care delivery at Olabisi Onabanjo University Teaching hospital Sagamu.

IV. METHODOLOGY

A. Research design
A cross-sectional descriptive design was utilized to determine the knowledge and attitude of utilization information technology for delivery of nursing care services at Olabisi Onabanjo University Teaching hospital, Sagamu.

B. Research setting for the Study
The study was conducted at Olabisi Onabanjo University Teaching Hospital (OOUTH). The OOUTH is state owned tertiary institution formerly called Ogun State University Teaching Hospital (OSUTH) is situated at Sagamu, Ogun State, Southwest Nigeria.

The study population was the nurses working in Olabisi Onabanjo University Teaching hospital Ogun State. The sample sized was determined using Taro Yamane's formula to

$$n = \frac{N}{1+N\,(E)^2}$$

$$n = \frac{201}{1+201(0.05)^2}$$

$$n = \frac{201}{1+201(0.0025)}$$

$$n = \frac{201}{1+0.5025}$$

$$n = 201/1.5025 = 133.7777$$

Non-response rate of 10% of the study sample was used which $10/100 \times 134$ so 13 = 147

The proportional stratified method was used to 147 consenting nurses all the wards/units.

C. Instrument for data collection

The study used questionnaire designed using the specific objectives knowledge and attitude towards utilization of information technology for nursing care delivery among nurses at Olabisi Onabanjo University Teaching Hospital, Sagamu. Nigeria. The questionnaire is divided into sections using both close and open questions

D. Methods of data collection

An introductory letter was obtained from the head of department of national Open University health research ethical committee (NOUHREC). The researcher was given an approval to administer the questionnaire. The letter of approval and questionnaires was presented to the head of nursing department of the hospital who briefed the head of units (HOUs) of the wards. Respondents were approached during the working shift periods (morning, evening and night) in order to have access to the whole sample within the wards and the respondents filled the questionnaires at their convenient time and later retrieved.

E. Method of data analysis

Retrieved copies of the questionnaire will be processed using statistical package of social sciences (SPSS) software version 22.0 Descriptive and inferential statistics analysis will be done on demographic data and research question using frequency counts, percentages, mean and standard deviation. The hypotheses will be tested using simple regression analysis.

V. RESULT

This present study determined the knowledge and attitude towards the utilization of information technology in the delivery of nursing care among nurses at Olabisi Onabanjo University Teaching Hospital (OOUTH) Ogun state, Nigeria. A sample of 147 nurses of OOUTH were selected and 126 questionnaires were retrieved for data analysis. Thus accounted for 85.71% respondent rate. Statistical Package for Social Sciences (SPSS), version 22 was used for data analysis. Therefore, the data presented and analysed in this section as presented.

Variables		Frequency n	Percentage %
Age Group	25 – 34	26	21.0
	35 – 44	38	30.0
	45 – 54	35	28.0
	55 years and above	27	21.0
Gender	Male	49	39.0
	Female	77	61.0
Marital Status	Single	31	25.0
	Married	72	57.0
	Divorced, Widowed, Separated	23	18.0
Religion	Christianity	67	53.0
	Islamic	56	45.0
	Other	3	2.0
Ethnicity	Yoruba	90	71.0
	Igbo	23	18.0
	Hausa	13	11.0
Rank/Cadre	NO II	21	17.0
	NO I	31	25.0
	SNO	32	25.0
	PNO	21	17.0
	ACNO	11	9.0
	CNO	10	8.0
Ward	Female Surgical	12	10.0
	Male Surgical	16	13.0
	Obstetrics/Gynaecological	13	10.0
	Accident & Emergency	27	21.0
	GOPD	11	9.0
	COPD	15	12.0
	Paediatric	15	12.0
	Virology	17	13.0
Length of Practice	Less than 2 years	16	13.0
	3 – 10 years	33	26.0
	11 – 20 years	44	35.0
	21 – 30 years	20	16.0
	30 years & above	13	10.0

Table 1: Socio-demographic data of respondents

Table 1 shows the socio-demographic data of the respondents. About 21% were aged 25 – 34years and 21% 55years and above. Majority 30% of the respondents were aged 35 – 44years. About 39% were male and 61% female. About half 53% were Christianity, and 57% married, while majority 71% were Yoruba and One-quarter (25%) were NO I and SNO respectively. One-tenth 10% of the respondents worked in female surgical ward, 13% male surgical ward, 10% Obstetric/Gynecological ward, 21% were in accident & emergency ward, 9% in GOPD, 12% worked in COPD and Paediatric while 13% worked in Virology.

Work Experience, about 35% had experience within the year 11 – 20 years.
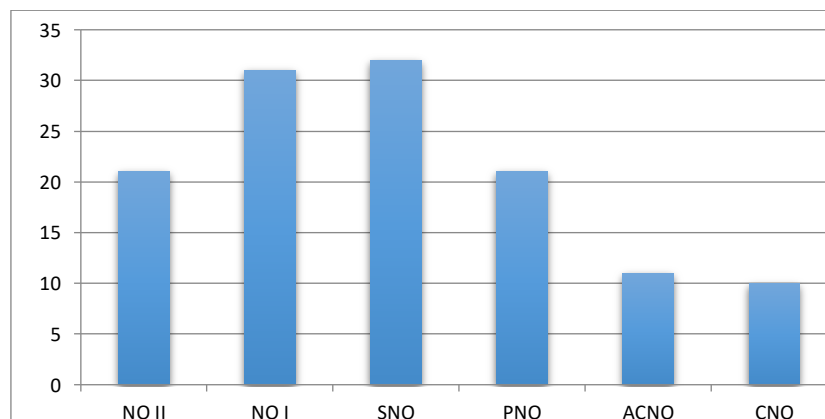

Fig. 1: Units of the respondents (Nurses)

Questions	Yes	No
Information Technology is the sending, processing and receiving information about patients through electronic means or computers?	126 100%	- -
Nursing technologies include telenursing, electronic charting, smartphones, Automated IV pumps and sensor	126 100%	- -
Point of care technology is technology designed to be used by Nurses deliver nursing care to patients where they are.	126 100%	- -
Technology scanners, mechanical ventilator, Vital signs machine	126 100%	- -
Information technology enhances quality nursing care delivery	86 68%	40 32%
Seeking information technology regarding patients such as lab results, medical records and history (both present and past history)	95 75%	31 25%
Information technology to deliver nursing care to patients	75 60%	51 40%
Information technology for report writing, record keeping and documentation of nursing tasks	69 55%	57 45%

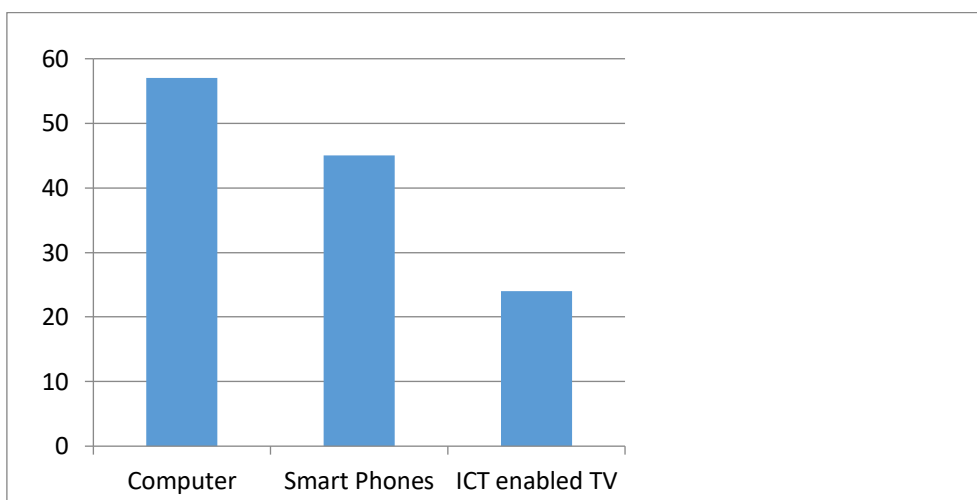Table 2: Knowledge on Utilization of Information Technology for Nursing Care Delivery among Nurses

Fig. 2: Devices used by respondents for utilization of IT in delivery of Nursing care

Statements	SA	A	UD	D	SD
Utilization of I violates patients'privacy and confidentiality	48 38%	66 52%	12 10%	-	-
I know that utilization of Information technology requires high and more qualified skills	27 21%	75 60%	-	12 10%	12 10%
I can't use Information technology for nursing care delivery because time to log on is too long	11 9%	12 10%	-	30 22%	72 59%
I believe that utilization of Information technology restricts autonomy of nurses in making decisions related to patients care	27 21%	81 64%	-	9 7%	9 7%
Information technology for nursing care delivery increases nurses' workload	-	-	27 21%	81 64%	18 14%
Nursing care to the patients on papers to computers as it requires a lot of mental efforts	18 14%	90 71%	-	18 14%	-
Using information technology is often frustrating	13 10%	17 13%	34 27%	32 25%	30 24%
Utilization of Information technology increases errors of health team	17 14%	82 65.1%	27 21%	-	-

Table 3: Attitude towards the Utilization of Information Technology for Nursing Care Delivery among Nurses

Attitude of nurses towards utilization of IT for delivery of nursing care services to patients was examined in Table 4.6. The table revealed that 38% of the respondents had a strong belief that utilization of IT violates patients' privacy and confidentiality, 52% agreed with the statement while 10% were undecided. Based on the descriptive analysis, a mean deviation of 4.29 implies a strong level of agreement that utilization IT violates patient's privacy and confidentiality.

On skill requirement for IT utilization, 21% of the nurses strongly agreed that utilization of IT demands high and more qualified skills, 60% agreed while 20% of the respondents disagreed. It was also revealed that 85% of the respondents believed utilization of IT restricts autonomy of nurses in making decisions related to patients care while 14% disagreed. 78% of the respondents affirmed that utilization of IT does not increases nurses' workload, however, 21% of the

nurses were undecided on whether IT increases nurses' workload or not. Contrarily, 85% of the nurses preferred documentation of nursing care delivered to patients on paper because inputting data on computers requires a lot of mental efforts. 23% of the nurses agreed that using IT is frustrating, 49% disagreed while 27% were undecided. Also, 79% of the nurses said utilization of IT increases errors of health team personnel due to misinterpretation of data provided by machines.

The below table revealed that there is a positive correlation between knowledge of nurses on ICT and Utilization of IT for nursing care delivery (r = 0.512). Moreover, the R square value of 0.574 indicates that knowledge of nurses on IT contributes 57.4% to utilization of IT for nursing care delivery. Other factors accounts for the remaining 42.6%.

Model Summary[b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.512[a]	.574	.520	2.23429

Table 4: Bivariate analysis of Knowledge and utilization of ICT

VI. DISCUSSION OF FINDINGS

The study examined the relationship between knowledge of nurses on Information Technology (IT) and utilization of IT for delivery of nursing care among nurses at Olabisi Onabanjo University Teaching Hospital (OOUTH).

In this present study, the findings shows that the respondent knew the meaning IT for delivery nursing care. Moreover, virtually all the nurses have used IT for provision of nursing care includes medications, scanners, mechanical ventilator and vital signs machine. Thus, contrary to findings of Bagheri, Hamidizadeh, & Sabbagh, 2015, who reported that lack of knowledge have minimized the optimal information technology integration. As well Bickford (2015) asserts that not every nurse need to be informatics specialist, though every nurse must be informed about the use of computer and information technology literate because nurses require accurate and up-to-date information, as information technology continues to expands. The findings of Tubaishat,, 2016 have also indicated that nurses were, generally, supportive of computerization in the workplace.

The IT utilization among nurses, 45% of the respondents utilized computers to provide health information to patients, 36% used smart phones (smart TV). This implies that computers and smart phone were the major IT devices, although about 21% of the respondents in emergency response system, 10% in performing health education in the facility, 14% for ascertaining treatment compliance of patients. Thus, in in contrast to a Nigerian hospitals showed that 88.9% of the computers were utilized because of adequate resources and attributes of ICT facilities (Adesuyi et al 2020). Also, it was revealed that 83% of the nurses used smart phones for appointment reminder to patients. It was also revealed that computer is preferably used by 75% of the

nurses for keeping both patients' and nurses' records. According to Campbell, et al. (2015) found that nurses still manage information through a combination of methods, including paper and pencil, computer-based records, remote monitoring devices and the use of the Internet. Research indicates that, although nurses might be willing to learn new technologies, such as complex monitoring equipment or complicated life-saving procedures, the mastery of information technology, to date, has been of low priority (Christe, 2017).

Moreover, on attitude of nurses on utilization of Information Technology (IT), approximately 90% of the nurses believed IT intrudes patients' privacy. Also, 80% of the nurses affirmed that utilization of IT requires high and more qualified skill. In contrast, the results of other studies have suggested that nurses" age is a significant predictor of attitudes, with younger and often less-experienced nurses having more positive attitudes towards computers than their older colleagues (Conley & You, 2017). It was also revealed that 85% of the respondents believed utilization of IT restricts autonomy of nurses in making decisions related to patients care while 14% disagreed. Corresponded to Porter-O"Grady (2014) lamented that many nurses were the last generation of the industrial age, and they should have moved into an intensifying technological age because the traditional practices and functions of nursing were no longer relevant and sustainable (Suppiah Dall, 2014). In the similar vein, majority (78%) of the respondents affirmed that utilization of IT does not increases nurses' workload, however, 21% of the nurses were silent on whether IT increases nurses' workload or not. 85% of the nurses preferred documentation of nursing care delivered to patients on paper because inputting data on computers requires a lot of mental efforts. Findings also revealed that 23% of the nurses agreed that using IT is frustrating, 49% disagreed while 27% were undecided. A

study conducted by Gonen & Lev-Ari, who found that those who had worked longer in nursing had a more positive attitude toward computers (Gonen & Lev-Ari, 2016). A study described the knowledge of and attitudes toward computers of graduate nursing students before and after an elective course of Computers in Nursing (Shin, Cummings, & Ford, 2018).A study reported that nurses who worked in hospitals without computers had higher mean scores, indicating a more favorable attitude toward computers and I T(Chong et al., 2016).

VII. SUMMARY

The study determined the IT knowledge of the nurses, and IT utilization, attitude of nurses towards utilization of IT. A survey research design was adopted and selection of 147 nurses considered as the sample. However, 126 respondents returned and analysed.

Data collected were descriptively analysed using frequency tables, percentage, chart, standard deviation and mean. The test of hypothesis was done with the use of regression statistics tool. It was revealed from the results of the data analysis that there is a high level of IT knowledge among nurses in OOUTH. Moreover, the findings show a positive significant relationship between IT knowledge and utilization of IT for delivery of nursing care among nurses in OOUTH. Furthermore, electric power supply, access to IT devices, IT knowledge, work experience, availability of computer training centres are found as factors associated with the utilization of IT among nurses.

VIII. CONCLUSIONS

The study found a significant relationship between nurses' knowledge on Information Technology (IT) and utilization of IT for nursing care delivery among nurses in OOUTH.

IX. RECOMMENDATIONS

Based on the findings of this study, the following are recommended:
- Nurses should be practically trained on how to use IT devices before utilizing it to provided health care for patients.
- Nurses should be properly taught on how to interpret output information on the IT devices to avoid misinterpretation of information which may lead to medical errors and mistakes.
- Nurses should be provided with access to information technology in order to enhance communication between nurses and patients.
- Government should encourage the utilization of IT by providing uninterrupted electricity supply for the hospitals.

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