UTILIZATION OF HEALTH INFORMATION TECHNOLOGY IN PROVISION OF MATERNAL AND CHILD HEALTH CARE AMONG NURSES IN THE UNIVERSITY OF CALABAR TEACHING HOSPITAL, CALABAR

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ABSTRACT

This study was assessed utilization of health information technology in provision of maternal and child health care among nurses in the University of Calabar Teaching Hospital, Calabar. The research design employed for the study was descriptive survey design. The sample of one hundred and ninety-six (196) registered nurses/midwives from the population of nurses providing maternal and child healthcare in maternity ward, children's ward, pediatric ward, labour ward, antenatal clinic and postnatal clinic at UCTH, Calabar using simple random sampling technique. The instrument of data collection was a validated structured questionnaire. Data collected were analyzed using descriptive statistic, charts, frequencies tables and percentages. The findings of the study revealed that majority (87.2%) of nurses working in UCTH, Calabar use paper based routine health information system. The factors inhibiting utilization of health information technology among nurses to deliver maternal and child healthcare in UCTH, Calabar include: inadequate knowledge of informatics, lack of comprehensive training of nurses on ICT utilization, unavailability of health information technology tools, lack of constant power supply Based on the findings of the study the it was recommended that health policy makers, hospital managements and nurse leaders should ensure that electronic health information technology are utilized in healthcare service at UCTH, Calabar.

KEYWORDS: utilization, Health information technology, maternal and child health care and nurses

INTRODUCTION

Technology has increased rapidly over the past four decades, and has become an integral part of healthcare (Fergus and Igwe, 2013). It has been noted that paper based routine health information system often requires repetitive data entry, but information technology (IT) is changing the way people and organizations work, access to relevant health information tends to improve with the use of electronic health information systems, in the West Bank, the primary health care system for maternal and child health was entirely paper-based, with care providers spending considerable amounts of time maintaining multiple files and client registers (Agwu, 2018). Information technology (IT) is becoming increasingly important as a source of information to guide practice and manage patient care.

Nurses and midwives therefore need to be proficient in its use as pregnancy is a unique condition in the life of a woman which needs to be taken very seriously (Lwin et al, 2008). Nigeria is witnessing continually advocacy and an increased number of individuals yearning for the computerization of health information and healthcare processes. On the other hand, the government is evolving policies and strategies for the adoption and implementation of health information (Adeleke *et al.,* 2014). This is evident in the development of a draft by the federal ministry of health and the ministry of communication technology which was termed the National Health Information Communication Technology (ICT) strategies framework.

Utilization of health information technology in maternal and child health is important in improving the well-being of mothers, infants, and children. It has enabled

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developed and developing countries to save lives of women and their babies in the most vulnerable groups thereby reducing morbidity and mortality rate (Bhati, D. k. 2015). The continuum of care for the child has three distinct phases; foetus, infant and early childhood. Consequently, the range of services available for mothers and children in all these phases is one of the most diverse within the health care system. To meet these expectations of providing safe and effective care in the healthcare environment, informatics competencies are critical and essential for nursing and midwifery practice (Greer, 2012). For effectiveness and consistent utilization of health information technology in maternal and child health care services, the committee in charge of research and ethics UCTH should develop and implement an e-governance project which will provide micro-level details of maternal and child health care indicators on monthly basis which ensures better health for women and children thus minimizing maternal and neonatal morbidity and mortality. This research is seeks to assessed health information technology and utilization in maternal and child health care among midwives in University of Calabar Teaching Hospital, Calabar, Cross River State. Nigeria.

MATERIALS AND METHODS

A descriptive cross sectional design was adopted for the study, the setting of the study was the University of Calabar Teaching Hospital, Calabar established in 1979. It is a tertiary health facility located in Calabar Municipal Local Government Area along Unical hotel road by West, Bounded in the North by Edim Otop community, in the East by Satellite Town and South by University of Calabar. The hospital has health care service department, the administrative department, laundry unit and mortuary services. The healthcare services include laboratory department, internal medicine, surgery, nursing services, community medicine, family medicine, pediatrics, labour ward, obstetrics and gynaecology, radiology, ophthalmology, physiotherapy, orthopedics, food and nutrition, accident and emergency, dental department, blood bank and dialysis unit. It is also a research centre and is made up of seven clinical departments, 48 nursing units, 415 beds and 300 cots. The staff strength is 2,946, number of nurses is six hundred and one (601). The sampling technique used in this study is the simple random sampling technique. A sample of one hundred and ninety-six (196) registered nurses/midwives (RN, RM) was selected from the accessible population of 385. This sampling technique was used to select registered nurses/midwives (RN, RM) that were presented at the time of the study. The sample size was determined from the population of the study (385) using Taro Yamane formula for sample size determination. The formula reads thus:

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

Where;
n = Sample size
N = Population
e = Level of significance
Substituting:

$$n = \frac{385}{1 + 385 (0.05)^2}$$

$$n = \frac{385}{1 + 385 (0.0025)}$$

$$n = \frac{385}{1 + 0.9625}$$

$$n = \frac{385}{1.9625}$$

$$n = 196.17$$

$$n = 196$$

The instrument used for data collection was a self-developed, validated well-structured questionnaire was tested for content validity. the reliability was done using the test-retest method. There after the information was analyzed for a co-efficient value which yielded coefficient index of 0.86. Data for this study were collected through face-to-face administration of questionnaires to the respondents who met the criteria for the study. Descriptive analysis of the personal data was analyzed using descriptive statistics, charts, frequencies tables and percentages.

Ethical Consideration

A letter of permission was obtained from the ethics committee, UCTH, Calabar, to carry at the study. Participants in this study was allowed to decide whether to participate or not after explaining the purpose of the study verbally. Respondents were also informed that information provide was treated with confidentiality and free to withdraw from participation of the study at any time.

PRESENTATION OF RESULTS

Table 4.1 Socio-Demographic Characteristics of the Respondents (n = 196)

Variables	Frequency	Percentage (%)
Gender		
Male	22	11.2
Female	174	88.8
Age:		
Below 21 years	6	3.1
21 - 30 years	51	26.0
31- 40 years	63	32.1
41 - 50 years	47	24.0
51 years & above	29	14.8
Marital status		
Single	65	33.2
Married	117	59.7
Divorced	8	4.1
Widow(er)	6	3.1
Academic Qualification		
RM/RN	87	44.4
B.Nsc.	94	48.0
M.Sc.	15	7.6
Years of experience		
< 1-5 years	21	10.7
6-10 years	18	9.2
11-15 years	76	38.8
15-20 years	47	24.0
> 20 years	34	17.3
Religion		
Christians	179	91.3
Islam	4	2.0
African Traditional Religion	7	4.6
Others	4	2.0

*Others = Ogboni, EKANKER and AMORC

The results of Socio-demographic data of respondents presented in Table 1 revealed that majority of the respondents, 174 (88.8%) are females, while males are 22 (11.2%). Also, most of the respondents, 63 (32.1%) were aged 31 – 40 years; 51 (26.0%) respondents were aged between 21 - 30 years; 47 (24.0%) respondents were within the age of 41-50 years; 29 (14.8%) respondents were aged 51 years and above, while 6 (3.1%) were aged below 21 years. The table also, showed that most of the respondents, 117 (59.7%) were married, 65 (33.2%) were single, 8 (4.1%) were divorcees, while 6 (3.1%) were widows. Large number 94 (48.0%)] had B.N.Sc. degrees, 87 (44.4%) had registered nurses and midwives' certificates (RN/RM), while 15 (7.6%) respondents had Masters' degree. Most respondents 76 (38.8%) had 11-15 years of experience, 47 (24.0%) respondents 15-20 years of experience, 34 (17.3%) respondents had over 20 years of experience, 21 (10.7%) respondents had 1-5 years of experience, while 18 (9.2%) respondents had 6-10 years' experience. Finally, majority, 179 (91.3%) respondents were Christians, 4 (2.0%) respondents were Moslems, 7 (4.6%) respondents were Traditional African Religion worshippers, while 4 (2.0%) respondents were members of other religions like Ogboni, EKANKER and AMORC.
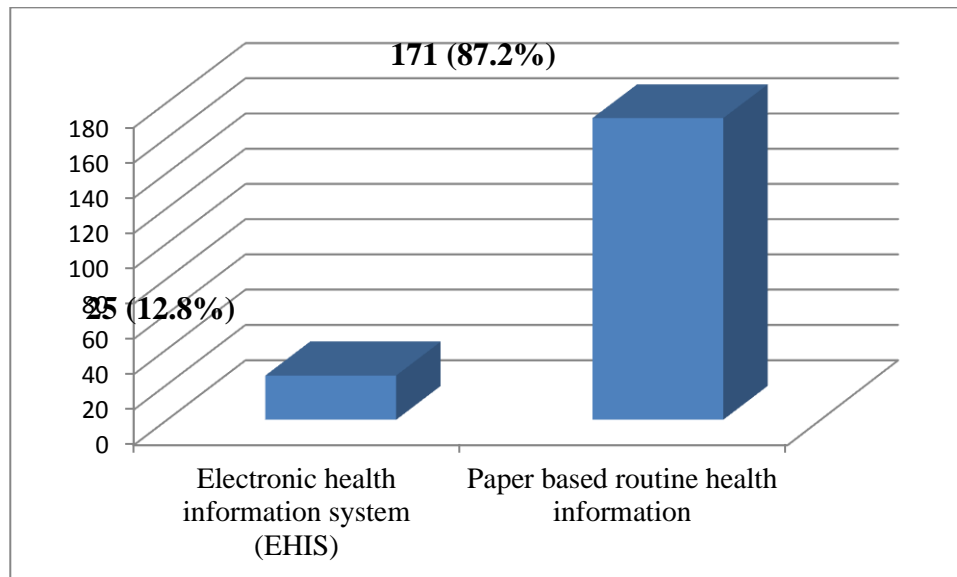
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171 (87.2%)

25 (12.8%)

Figure 1: Bar Chart showing types of health information technology used in the delivery of maternal and child health care services at UCTH, Calabar

Results presented in Figure 1 revealed that majority of the respondents, 171 (87.2%) said they utilize paper based routine health information system, while 25 (12.8%) respondents asserted that they utilize Electronic Health Information System (EHRs). Thus majority (87.2%) of nurses working at UCTH, Calabar used paper based routine health information system to provide maternal and child health care services.

Table 2: Extent of utilization of health information technology in delivery of maternal and child health care services Calabar Teaching Hospital, Calabar   (n = 196)

Utilization of health information technology variables	Never		Sometimes		Often		Very often		∑	X̄
	Freq	%	Freq	%	Freq	%	Freq	%		
Utilization of electronic routine health information technology to access patients' health information	171	87.2	25	12.8	0	0.0	0	0.0	221	1.13
Utilization of paper based health information technology to access patients' health information	0	0.0	0	0.0	25	12.8	171	87.2	759	3.87
Utilization of electronic health information technology for interdisciplinary communication	143	73.0	53	27.0	0	0.0	0	0.0	298	1.27
Utilization of paper based health information technology for interdisciplinary communication	0	0.0	0	0.0	53	27.0	143	73.0	731	3.73
Utilization of electronic health information technology to provide patient with copy of their health information upon request.	167	85.2	29	14.8	0	0.0	0	0.0	225	1.15
Utilization of paper based health information technology to provide patient with copy of their health information upon request.	0	0.0	0	0.0	29	14.8	167	85.2	755	3.85
Utilization of electronic health information technology to record and chart changes in vital signs.	178	90.8	18	9.2	0	0.0	0	0.0	214	1.09
Utilization of paper based health information technology to record and chart changes in vital signs.	0	0.0	0	0.0	178	90.8	18	9.2	606	3.09
Total								Mean (X) =		19.18

*Mean ($\overline{X}$ ±SD) Score of 2.5 and above indicates high level utilization, while below 2.5 indicates low utilization

Table 3: Factors facilitating utilization of health information technology among nurses in UCTH, Calabar
(n = 196)

Facilitating factor variables	Agreed		Disagreed		Σ	$\overline{X}$
	Freq.	%	Freq.			
Adequate knowledge of health information technology will enhance its utilizing.	196	100.0	0	0.0	392	2.0
Availability of computers in the hospitals will facilitate utilization of health information technology among nurses.	176	89.8	20	10.2	372	1.89
Proper training of nurses on how to operate ICT tool will also facilitate usage.	196	100.0	0	0.0	392	2.0
Implementation of hospital policy on utilization of health information technology will facilitates its utilization among nurses	163	53.2	33	16.8	359	1.83
Hospital management support and provision of institutional guideline will encourage nurses to use health information technology in delivering care.	155	79.1	41	20.9	351	1.79
Total				Mean (X) =		9.5

Mean ($\overline{X}$ $_\pm$SD) Score of >1.5 indicates high effect, while below <1.5 indicates low effect

Table 3 revealed that all 196 (100.0%) respondents agreed that knowledge of health information technology will enhance its utilizing and proper training of nurses on how to operate informatics tool, and implementation of hospital policy on utilization of ICT will facilitates its utilization among nurses. Also, majority of the respondents, 176 (89.8%) agreed that availability of computers in the hospitals will facilitate utilization of health information technology among nurses, but 20 (10.2%) respondents disagreed. Furthermore, most of the respondents, 163 (53.2%) agreed that implementation of hospital policy on utilization of health information technology will facilitates its utilization among nurses, but 33 (16.8%) respondents disagreed.

Lastly, most of the respondents, 155 (79.1%) agreed that hospital management support and delivery of institutional guideline will encourage nurses to use health information technology in delivering maternal and child healthcare, but 41 (20.9%) respondents disagreed. Following the results presented in Table 3, the factors facilitating utilization of nursing informatics among nurses to deliver care in UCTH, Calabar include: adequate knowledge of health information technology, proper training of nurses on how to operate ICT tool, implementation of hospital policy on utilization of health information technology, availability of computers in the hospitals and hospital management support and provision of institutional guideline for utilization of health information technology.

Table 4: Factors Inhibiting utilization of health information technology in maternal and child care among nurses in UCTH, Calabar   (n = 288)

Facilitating factor variables	Agreed		Disagreed			$\overline{X}$
	Freq.	%	Freq.		$\sum$	
Inadequate knowledge of health information technology affects utilization of health information technology among nurses.	142	72.4	54	27.6	338	1.72
Lack of comprehensive training of Nurses on health information technology affects utilization of ICT among nurses.	166	84.7	30	15.3	362	1.85
Unavailability of electronic health information technology tools hinders its utilization.	196	100.0	0	0.0	392	2.0
Lack of constant power supply is also a barrier to utilization of health information technology among nurses.	196	100.0	0	0.0	392	2.0
The absence of reliable and accessible internet service connection is a barrier to utilization of health information technology among nurses.	196	100.0	0	0.0	392	2.0
Total				Mean (X) =		9.5

Mean ($\overline{X}$ $\pm$SD) Score of >1.5 indicates high effect, while below <1.5 indicates low effect

Table 4 revealed that all 196 (100.0%) respondents agreed that unavailability of electronic health information technology tools, lack of constant power supply and the absence of reliable and accessible internet service connection are barrier to utilization of health information technology among nurses. Also, majority of the respondents, 142 (72.4%) agreed that inadequate knowledge of health information technology affects utilization of health information technology among nurses, but 54 (27.6%) respondents disagreed. Furthermore, majority of the respondents, 166 (84.7%) agreed that lack of comprehensive training of Nurses on health information technology affects utilization of ICT among nurses, but 30 (15.3%) respondents disagreed.

Following the results presented in Table 3, the factors inhibiting utilization of health information technology among nurses to deliver maternal and child healthcare in UCTH, Calabar include: inadequate knowledge of informatics, lack of comprehensive training of nurses on ICT utilization, unavailability of health information technology tools, lack of constant power supply and hospital management support and absence of reliable and accessible internet service connection.

DISCUSSION OF FINDINGS
The findings of this study revealed that majority (87.2%) of nurses working in UCTH, Calabar used paper based routine health information system to provide maternal and child health care services. Health information technology includes various technologies that span from simple charting, to more advanced decision support and integration with medical technology (Kassani et al, 2015), but the tertiary healthcare institution (UCTH) has not implemented health policy mandating nurses to use electronic health information technology. Consequently, most of the wards lack ICT tools like computers, steady power supply and internet connection to enable nurses utilize health information technology in the delivery of care.

The finding correspond with a previous study by Rania, Soheir, Nagat & Samerra (2014), whose assessment of knowledge of nursing informatics in Cairo, Egypt revealed that most healthcare facilities in developing countries still rely on paper-based health information records rather than adopting electronic health information technology. Similarly, the findings agree with a study by Ademuyiwa, Faleke and Otetubi (2020) in University Teaching Hospital in Lagos, Nigeria, which revealed that the type of health information system mostly in used is routine paper based health information records with only few units in the facility using electronic health information systems.

Also, finding revealed that the extent of utilization of electronic health information technology among nurses in delivery of maternal and child healthcare at UCTH, Calabar is very low, while utilization of paper based health information technology is high. Majority of the nurses have never utilized electronic health information technology to access patients' health information, record and chart changes in vital signs or provide

interdisciplinary communication. The result is consistent with the study by Ibebuike et al., (2019), in Imo state Teaching hospital in Orlu in Nigeria whose finding showed that the extent of utilization of health information technology to provide nursing care is low due to unavailability of ICT tools, and low knowledge health information technology to provide healthcare services.

Finding further revealed that factors facilitating the utilization of health information technology among nurses at UCTH, include: adequate knowledge of health information technology, proper training of nurses on how to operate ICT tool, implementation of hospital policy on utilization of health information technology, availability of computers in the hospitals and hospital management support and provision of institutional guideline for utilization of health information technology. When nurses have adequate knowledge of health information technology and are given proper training on how to utilization such technology, they will be prepared and ready to utilize it in delivering care to clients. If health information technology tools like computers are made available to them and hospital management support and provide institutional guideline for utilization of nursing informatics, then the level of nurses' utilization of informatics to deliver care will be high. Otherwise the reverse will be the case.

This findings is inline with a study by Gyamfi,et al (2017) on barriers and facilitators to electronic medical record usage in emergency centre at Komfo Anoykye Teaching Hospital, Kumasi-Ghana. The study revealed that facilitators for utilizing nursing health information technology included training of staff and availability of ICT tools like computers and electricity. Similarly, the findings correspond with a study by Dugstad, Nilsen, Sundling & Eide (2020), whose evaluation of facilitators and barriers during implementation of wireless nurse call systems in residential care facilities in Norway revealed that adequate staff training, support and availability of technical assistance for staff.

In addition, findings further revealed that factors inhibiting utilization of health information technology among nurses at UCTH, include: inadequate knowledge of informatics, lack of comprehensive training of nurses on ICT utilization, unavailability of health information technology tools, lack of constant power supply and hospital management support and absence of reliable and accessible internet service connection. When nurses lack the required knowledge and are not regularly trained on how to utilize informatics in delivering care, they will be deficient in utilizing it. Also, if the healthcare facility lacks functional informatics tools such as computers, constant power supply and a reliable and accessible internet service, utilization of informatics to deliver care will be low.

The findings correspond with a study by Adedeji, Irinoye, Ikono and Komolafe (2018) who maintained that factors influencing the use of electronic health records among nurses in teaching hospitals in Nigeria, were inadequate training, lack of informatics tools, and lack of steady power supply are factors affecting utilization of electronic health information technology among nurses. Another study by Olajubu, Irinoye and Olowokere (2014) also showed that limited access to computer and lack of health policy mandating the utilization of electronic health record system affects utilization of informatics.

CONCLUSION

Utilization of health information technology to deliver care is an effective way of quality delivery of nursing care, the level of utilization of electronic health information technology among nurses at UCTH is low. Health policy makers, hospital managements and nurse leaders should ensure that health information technology is utilized in the delivering healthcare service at UCTH, Calabar.

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