USE OF INFORMATION AND COMMUNICATION TECHNOLOGY BY MEDICAL DOCTORS IN THE MANAGEMENT OF HIV/AIDS IN THE TWO NIGERIAN UNIVERSITIES TEACHING HOSPITALS.

By

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Abstract:

The implementation of ICT programme is never in a vacuum but built on interventions that can potentially influence existing socio-cultural and technical systems, which can transform healthcare delivery through various forms of e-health initiatives particularly in the areas of disease control such as HIV/AIDS. This study seeks to investigate use of information and communication technology by medical doctors in the management of HIV/AIDS in two Nigerian University Teaching Hospitals (Delta State University teaching hospital, Oghara and Obafemi Awolowo University teaching hospital, Ife). The study majorly adopted the descriptive research design. A sample size of 60 medical doctors responsible for the management of people living with HIV/AIDS in the two university teaching hospitals were drawn from the study location for

inclusion in the study. The findings of this study revealed that medical doctors in Nigeria are willing to use ICT in the management of HIV/AIDS for several factors. The study also identified a host of ICT tools that can be used by Nigerian medical doctors to include: mobile computers, Smartphone's databases, email and other for the management of HIV/AIDS. It was also found that there is the need for steady power supply to facilitate ICT usage by medical doctors. The study therefore recommended for training programmes on skill acquisition on the use of ICT, steady power supply, and provision of internet subscriptions amongst others to facilitate ICT usage for HIV/AIDS management by medical doctors in Nigeria.

Keywords: Medcal Doctors, Medcal Practice, ICT, ICT Use, HIV/AIDS, Health Care, University Teaching Hospitals, Nigeria.

Introduction

Information and communication technology (ICT) projects cannot be impemented in a vacuum, rather, interventions can potentially influence the existing socio-cultural-technical systems (Chandwani, & De, 2015) to bring about the best domino effect. According to O'Donnell, and Sweetman, (2018) "ICT enable us to contact others, conveying information over distances and bridging gaps between people and messages (both literally and figuratively), enabling individuals to join together in groups and creating new opportunities for organization". They further stated that it offer exceptional opportunities to groups (including medical doctors) to advance their interests and priorities (O'Donnell, & Sweetman, 2018) through creation and transferring of information from remote location widely dispersed.

Consequent upon this, ICT have transformed heathcare delivery through various forms of e-health initiatives particularly in the areas of disease control, diagnosis, patient management, teaching, communication, storage, and retrieval of medical information without being sensitive to gender (Okonkwo, 2021). ICT are important tools that can facilitate the overall handling of medical information. It is against this backdrop that the gender of medical doctors using ICT in the management of HIV/AIDS has to be examined. Specifically as there is a mixture of male and female medical doctors that are responsible for the management of HIV/AIDS through the use of ICT. It is no surprise therefore that in Nigeria, both male and female medical doctors now make use of ICT in other to render effective healthcare service delivery.

Literature Review

Several factors have been found to influence medical doctors' use of ICT in their health care service delivery to include performance expectancy, effort expectancy, other facilitating or inhibiting conditions, (Li, Talaei-Khoei, Seale, Ray, & MacIntyre, 2013). Favorable attitude about

using ICT tools for remote monitoring, availability of gadgets like Smartphone's and palm-computers, computer-related training, technical skills, experience in supporting patients using ICT tools, and work experience among others were found to also influence the use of ICT by medical doctors (Seboka, Yilma & Birhanu, 2021; Ojo, Oluwatumininu, Ani & Adedeji, 2021). These facilitating factors may include things like end user involvement in the design of eHealth devices and tools, interoperability (the ability to make systems and organizations work together) and professional autonomy had moderate influences on eHealth adoption while patient privacy concerns, legal concerns, and time cost had low influence (Kesse-Tachi, Asmah, & Agbozo, 2019). More to this, it was concluded by Kesse-Tachi, Asmah, and Agbozo (2019) that "institutional characteristics and healthcare manager characteristics have a high influence on

eHealth adoption". Hence, it is imperative for health institutions and managers to strategically

draw policies that will encourage medical doctors to use eHealth facilities to improve on

healthcare management in Nigeria.

ICT intervention services cannot only promote the improvement of HIV/AIDS prevention information, motivation, and behavior skills but can be used to inform the development of a convenient, low cost, easily disseminated tool to help prevent HIV infection among the general population (Liang, Yang, Abdullah, He, & Yang, 2020). By implication, it is a requisite tool that can bolster healthcare delivery and bring about wellness among the ordinary people who do not have the financial strength for health tourism.

There are a number of factors that can influence the usage of ICT in the management of HIV/AIDS. According to Alonge, Kiai, and Ndati (2017) "the use of these social media sites for HIV and AIDS information communication was influenced by privacy and neutrality". ICT tools such as social media platforms have greatly influenced HIV and AIDS information communication and was very useful because it facilitated access to quality tips on HIV (Alonge, Kiai, & Ndati, 2017). Humans generally used mobile phones to encourage and comfort another HIV/AIDS client that they know, learn new HIV/AIDS services and get health educational materials, and they also use mobile phones very often to seek advice on health issues from any sources (Nwagwu, 2021). According to Ochonogor and Mutula (2020) "the use of ICTs such as social media (SM) has further made the work environment a community pivot, a rallying point, rather than the solitary tedium that has retarded learning, communication, advancement, cooperation, and community support in the past".

Strategic use of information and communication technologies deployed by medical doctors played out in the realm of social media and has facilitated information communications by quickly restructuring forms of sociality and the tradecraft of identity politics (Montoya, 2018) to effectively manage HIV/AIDS. As ethical issues surrounds health information usage, privacy

factor must also be considered when planning and using ICT by medical doctors. According to Mwammenywa, & Kaijage (2018) "the mobile application platform will consequently help people to confidentially access the HIV/AIDS healthcare information in their mobile electronic gadgets frequently without fear of being exposed as if they would frequently visit CTCs". To adequately use and optimize the gains of ICT in the management of HIV/AIDS, they use appropriate tools for knowledge management and user-friendly system which can significantly improve the quality and safety of care provided for patients both at hospital and home settings is a prerequisite (Shahmoradi, Safadari, & Jimma, 2017).

According to Avery, Mills, and Stephan (2017) "numerous innovations have been described, including use of social media to expand reach and improve programmatic targeting; technology in healthcare settings to strengthen coordination, guide clinical decision-making and improve clinical interactions; and telephone-based follow-up to improve treatment retention and adkrence". Okoroafor, et al. (2017) "considering the epidemiologic realities and the burden of diseases in the continent, the method to be employed for effective implementation of telemedical practice in Africa should be of concern to health policy makers, medical practitioners, information technologists, researchers, and biomedical experts, taking into consideration the constantly transforming global society in health matters". Other challenges such as acceptance process, inadequate human resource, data quality and information flow issues, and existence of separate monitoring and evaluation systems (Kiwanuka, Kimaro, & Senyoni, 2015).

Challenges or obstacles faced by medical doctors in their use of ICT in the management if human health is multifaceted, while some would be concerned about information securty, lack of technical skills, unworkable technology and decreasing social interaction (Koivunen, Niemi, & Hupli, 2015); others would be concerned about proper laws and policies that support the e-health development, secure the necessary needed funds, addressing privacy concerns of stakeholders, and standardization of e-health development (Jalghoum, Tahtamouni, Khasawneh, & Al-Madadha, 2021). Lack of awareness, good infrastructure language barrier, ignorance, and lack of guidelines have also been identified as serious challenges negating the use of ICT by medical doctors (Sageena, Sharma, & Kuapur, 2021). More so, monetary aspects, technical prerequisites, data protection, privacy and patient confidentiality, time management, were acknowledged as key barriers (Cherrez-Ojeda, et al, 2020, Haluza, & Jungwirth, 2018).

Based on these aforementioned factors, it becomes pertinent to draw inferences. More so, to find out whether medical doctors' gender has any effect on their use of ICT in the management of HIV/AIDS in selected Nigeria university teaching hospitals.

Statement of the Problem

The use of ICT by medical doctors for healthcare service delivery has become a common phenomenon as they use it for many aspects of their practice. However, it has been observed that most of the studies conducted have mainly shown general use or male dominance in the use of ICT for medical purposes. This study seeks to investigate how male medical doctors' and their female counterpart use ICT in the management of HIV/AIDS in selected Nigeria university teaching hospitals.

Objectives of the Study

The objectives of the study are to:

- I. Establish the various factors that influence medical doctors' use of ICT in the management of HIV/AIDS,
- II. Determine the most preferred ICT tools used by medical doctors' in the management of HIV/AIDS, and
- III. Establish the challenges medical doctors' face in their use of ICT in the management of HIV/AIDS.

Research Questions

Three research questions were designed to guide this study. They are:

- I. What factors influence medical doctors' use of ICT in the management of HIV/AIDS?
- II. What are the most preferred ICT tools used by medical doctors in the management of HIV/AIDS?
- III. What challenges medical doctors' face in using ICT in the management of HIV/AIDS?

Research Hypothesis

The use of hypothesis in this study was to establish the relationship between the gender of medical doctors and their use of ICT tools in the management of HIV/AIDS. The hypothesis was tested in the study at 0.05 level of significance or alpha.

- I. There is no significant difference between the gender of medical doctors and their use of ICT tools in the management of HIV/AIDS.
- II. There is no significant difference between university teaching hospital and their use of ICT tools in the management of HIV/AIDS.

Methods

Research Design

The study majorly adopted the descriptive research design. This design has the ability to reveal individual characteristics that are peculiar or specific in nature and related to the objects being studied. The main rationale for the descriptive design is to expose the current situation in relation to an aspect of research study. Descriptive research design is a comprehensive plan for data

collection in an empirical research which relies heavily on qualitative data (Bhattacherjee, 2012).

Population of the Study

The population of this study is the entire University teaching hospitals in Nigeria. From this population, two (2) University teaching hospitals Obafemi Awolowo University teaching hospital, Ife and Delta State University teaching hospital, Oghara. These university teaching hospitals were selected for this study due to their national ranking. While Obafemi Awolowo University, Ife is ranked in the third (3rd) among the Federal universities, Delta State University was ranked number 8rd among the State Universities in Nigeria. The entire population of medical doctors in Obafemi Awolowo University Teaching Hospital, Ife is 822 (Adegboye, & Adeyoyin, 2020) while Delta State University Teaching Hospital has a total of 196 medical doctors. From this population, a sample size of 60 medical doctors responsible for the management of people living with HIV/AIDS in the 2 university teaching hospitals were drawn from the study location for inclusion in the study.

Instrument for Data Collection

Predominantly, data was collected through the use of the questionnaire. The questionnaire was used to elicit quantitative data on the use of information and communication technology by medical doctors in the management of HIV/AIDS in two Nigerian University Teaching Hospitals

.Validity of Instrument

To ensure that the instrument measures accurately the range of and comprehensive parts of the questionnaire, it was subjected to pre-test on similar population outside the sample location. The pre-test helped to reduce unnecessary items from the questionnaire and gave clarity to the items used for eliciting data from the respondents.

Reliability of Instrument

To ensure that the instrument consistently measured the same construct overtime, the instrument was subjected to scrutiny by some experts in Nigeria and South Africa before it was administered to the respondents at Obafemi Awoolowo University Teaching Hospital and Delta State University Teaching Hospital in Nigeria. The instrument was found useful before it was sent to the field.

Data Collection Procedures

Data were elicited through the questionnaire instrument, copies of the instrument were administered using three research assistance that helped in the administration of the instrument.

Data Analysis

The study adopted the descriptive and inferential statistical methods for data analysis. While the descriptive design implored simple percentage, frequency counts and standard mean, the complimentary inferential statistics was used for independent sample T-test to establish the relationships between gender and use of ICT tools by medical doctors in the studied university teaching hospitals. More so, inferential statistics was used to establish the difference between male and female medical doctors in their use of ICT tools in the management of HIV/AIDS. The study benchmarked the criterion mean at 2.50, while the alpha or significant level is 0.05.

Table 1: Response Rate of the Respondents

Copies of Questionnaire Administered	Copies of Questionnaire Returned	% of Returned Questionnaire
60	60	100%

From table 1, it shows that a total number of 60 copies of the questionnaire were administered to the respondents and a total number of 60 copies of the questionnaire were filled, returned, and found useful for the study, which represents a 100% response rate. This is due to the fact that the research assistants employed for this study were patient and able to explain the instrument to the understanding of the respondents.

Bio-data of the Respondents

This section of the study focuses on the bio-data of the respondents to address their age, gender, name of the university teaching hospital, Department, academic qualifications, and years of work experience. Tables 2 to 7 are used for the presentation of data relating to the bio-data of the respondents.

Table 2: Age Range of the Respondents

Age Range	Freq.	%
25-30 Years	12	20
31-35 Years	22	37
36 - 40 Years	18	30
41-45 Years	4	
46 – 50 Years	2	
51 Years and above	2	
Total	60	100

Data presented in Table 2 reveals the age range of the respondents, it was found that 22(37%) of the respondents were within the age range of 25-30 years, 18(30%) of the respondents were within the age range of 36-40 years, 12(20%) of the respondents are within the age range of 25-30 years. Also, 4(7%) of the respondents are within the age range of 41-45 years, while 2(3%) of the respondents are with the age range of 45-50 years and 51 years and above respectively. The findings showed that majority of the respondents that participated in this study are within the age range of 31-35 Years.

Table 3: Gender of the Respondents

Gender	Freq.	9/0
Female	21	35
Male	39	
Total		100

Data in Table 3 reveals that 39(65%) of the respondents are male, while 21(35) of the respondents are female. This indicates that majority of the respondents that participated in this study are male.

Table 4: Names of Teaching Hospital of the Respondents

Teaching Hospital		Freq.	0/0
Obafemi Awolowo Teaching Hospital,		36	60
Delta State Teaching Hospital,	University Oghara	24	40
Total		60	100

Table 4 shows that 36 respondents representing 60% were medical doctors from Obafemi Awolowo University Teaching Hospital, Ile-Ife, while 24 respondents representing 40% are medical doctors from Delta State University Teaching Hospital, Oghara. Therefore, from the findings of this study, it is observed that majority of the respondents that participated in this study were medical doctors from Obafemi Awolowo University Teaching Hospital, Ile-Ife, than those from Delta State University, Oghara.

Table 5: Departments of the Respondents

Department	Freq.	%
Family Medicine	13	22
Internal Medicine	17	29
Obstetrics and Gynaecology	19	32
Haematology and Blood	4	
Dermatology and Venerology	6	10
Total	59	100

Table 5 reveals information on the Departments of the respondents. It is revealed that 19(32%) of the respondents were from the Department of Obstetrics and Gynaecology, this was closely followed by 17(29%) respondents from the Department of Internal Medicine, 13(22%) respondents from the Department of Family Medicine, 6(10%) respondents from the Department of Dermatology and Venerology, and 4(7%) respondents from the Department of Haematology and Blood. From this study, it was observed that majority of the respondents that participated were medical doctors from the Department of Obstetrics and Gynaecology.

Table 6: Academic and Professional Qualifications of the Respondents

Qualification	Freq.	%
Ph.D.		2
M.Sc.	8	15
MBBS	22	41
MBBCHB	12	23
FMCP	5	9
MWACP	2	4
MD		2
Residency Training		4
Total	53	100

Table 6 reveals information on the academic qualifications of the respondents. It is revealed that 22(41%) of the respondents are MBBS degree holders, this was closely followed by 12(23%) respondents who are MBBCHB degree holders, 8(15%) respondents who are M.Sc. degree holders, 5(9%) respondents who are FMCP degree holders. It was equally revealed in Table 6 that 2(4%) of the respondents are MWACP degree holders and medical doctors on residency training respectively, while 1(2%) of the respondent is a Ph.D. degree holder and also another medical doctor who is the M.D of the Teaching Hospital. The findings from this study reveals that majority of the respondents were medical doctors with MBBS qualifications.

Table 7: Years of Experience of the Respondents

Years	Freq.	%
1-5 Years	14	23
6-10 Years	30	50
11-15 Years		22
16—Years and above	3	5
Total	53	100

Table 7 shows that 30(50%) of the respondents had 6-11 years of work experience, 14(23%) of the respondents had 1-5 years of work experience, 13(22%) of the respondents had 11-15 years of work experience, while 3(5%) of the respondents had 16- years above work experience. The findings reveals that majority of the medical doctors that participated in this study had work experience of 6-11 years.

Table 8: Factors Influencing Medical Doctors' Use of ICT in the Management of

Criterion Mean

HIV/AIDS					
Factors	SA	A	D	SD	X
I use ICT in the management of HIV/AIDS if there is ICT training program for medical doctors	22	32	4	2	3.23
I use ICT in the management of HIV/AIDS if government policies demand for it	21	36		3	3.25
i can only use ICT in the management of HIV/AIDS whenever i am ready		21	23	5	2.63
I can use ICT in the management of HIV/AIDS whenever time permits	13	19	20	8	2.62
I only use ICT in the management of HIV/AIDS when it is convenient and does not interfere with face-to-face services	10	25	19	6	2.65
I use ICT in the management of HIV/AIDS only when I get remunerated for the services		15	18		
I use ICT in the management of HIV/AIDS only when I see my peers using it	12	16	15	17	2.38
Ican only use ICT in the management of HIV/AIDS only when I have the tools in my home and office	21	18	12	9	2.85
Aggregate Mean					2.77

Table 8 reveals that the aggregate mean of 2.77 is higher than the criterion mean of 2.50, which implies that several factors influenced the use of ICT by medical doctors in the management of HIV/AIDS. The indication is that favorable government policy ($\bar{\mathbf{x}}$ _3.25), training programme ($\bar{\mathbf{x}}$ _3.23), availability of ICT tools at home and office ($\bar{\mathbf{x}}$ _2.85), convenience and non-interference with face-to face services ($\bar{\mathbf{x}}$ _2.65), readiness to use ICT by medical doctors ($\bar{\mathbf{x}}$ _2.63), time ($\bar{\mathbf{x}}$ _2.62), and remuneration for the use of ICT ($\bar{\mathbf{x}}$ _2.55) are the factors influencing the use of ICT tools in the management of HIV/AIDS by medical doctors in Nigeria.

Table 9: Circumstances under Which Medical Doctors Use of ICT in the Management of HIV/AIDS

Responses	Yes	No		
	Freq.	9/0	Freq.	%
Steady Internet connectivity	58	97	2	3
Steady power supply	55	92	5	8
Availability of personal computers in all medical doctors' offices and homes	52	87	8	13
Availability of electronic medical records (EMR)	55	92		8
Elimination of medical administrative bottlenecks on access to medical information	56	93	4	7
Availability of national databases for HIV/AIDS patients	54	90	6	10
Creation of medical doctors' workers association for management of HIV/AIDS both locally and	48	80	12	20
internationally				

Data in Table 9 reveals information on what will make medical doctors to use ICT in the management of HIV/AIDS. It was revealed that majority of the medical doctors agreed that steady internet connectivity (58, 97%), steady power supply and availability of electronic medical records (55, 92%) respectively are the factors that will make them to use ICT in the management of HIV/AIDS. Others include availability of national databases for HIV/AIDS patients (54, 90%), availability of personal computers in all medical doctors' offices and homes (52, 87%), and the creation of medical doctors' workers association for management of HIV/AIDS both locally and internationally (48, 80%).

Table 10: Most Preferred ICT Tools Used by Medical Doctors in the Management of

HIV/AIDS Responses	Yes		No	
	Freq.	%	Freq.	0/0
Mobile telephony	51	85	9	15
Personal digital assistants (PDAs)smart phones	50	85	9	15
Mobile computers	5.5	92	1-45	8
Television	35	58	25	42
Radio	37	62	23	38
MP3	30	50	30	50
Telecare devices	39	65	21	35
Projector/slides	49	82	11	18
DVDs	41	68	19	32
Audio cassettes	35	58	25	42
Audio CDs	38	63	22	37
Computer	56	95	3	5
Email	55	92	5	8
Medical electronic databases	57	95	3	5
Internet	58	97	2	3

Table 10 reveals the most preferred ICT tools used by medical doctors in the management of HIV/AIDS. It was found that majority of the medical doctors agreed that Internet (58, 97%), medical electronic databases, and computer (57, 95%) respectively, email, and mobile computers (55, 92%) respectively, mobile telephony (51, 85%), personal digital assistants (PDAs)/smart phones (50, 84%), projector/slides (49, 82%), DVDs (41, 68%), telecare devices (39, 65%), audio cassettes, and television (35, 58%) respectively are the most preferred ICT tools by medical doctors in the management of HIV/AIDS.

Table 11: Challenges HIV/AIDS	s Medical Doctors' Face in Usin	ng ICT in the Manag		ment of		
	Challenges	SA	A	D	SD	X
~ ~ ~ ~ ~ ~						

Cost of ICT tools	25	31	4		3.35
Cost of maintenance of ICT in the management of HIV/AIDS	27	29	3		3.37
Lack of ICT tools provided by the hospital management	30	22	7	1	3.35
Lack of ICT skills for effective application in the management of HIV/AIDS	29	23	6	2	3.32
Absence of training on the use of new ICT tools in the management of HIV/AIDS	24	27	8		3.23
High cost of internet subscription	31	21	7	1	3.37
Vulnerability of electronic sources than paper-based	22	23	12	2	3.10
ICT tools are easily replace by newer versions in quick succession demanding replacement of already acquired tools	17	24	15	4	2.90
Gross inadequate ICT infrastructure	27	29	3		3.37
Use of codes in storing electronic medical records	21	21	13	5	2.97
Unwilling attitude of medical doctors to accept ICT tools	16	17	15	12	2.62
Lack of cooperation by medical doctors in different institutions	15	18	16		2.62
Aggregate Mean					3.13

Criterion Mean 2.50

Data in Table 11 reveals the challenges medical doctors faced in the use of ICT in the management of HIV/AIDS. It was revealed that the aggregate mean of 3.33 is higher than the criterion mean of 2.50, which implies that medical doctors faced many challenges in the use of ICT in the management of HIV/AIDS patients. Specifically, the challenges include high cost of maintenance, high cost of internet subscription, and gross inadequate ICT infrastructure (\bar{x}_2 3.37) respectively. Other challenges are the cost of ICT tools, and lack of ICT tools provided by the hospital management (\bar{x}_2 3.35) respectively, lack of ICT skills (\bar{x}_2 3.32), absence of training on the use of new ICT tools (\bar{x}_2 3.23), vulnerability of electronic sources than paper-based (\bar{x}_2 3.10), use of codes in storing electronic medical records (\bar{x}_2 2.97). The challenges also include the replacement of ICT tools by a newer version (\bar{x}_2 2.90), as well as the unwilling attitude of medical doctors to accept ICT tools and the lack of cooperation by medical doctors in different institutions (\bar{x}_2 2.62) respectively.

CHOILE	Statistics
Group	Statistics

		N	Mean	SD	Std Error
Gender					Mean
Most	Female	19	26.1	3.9	.89146
Preferred ICT	Male	39	26.7	3.7	.58945

Independent Sample T-test										
	Levene's Test for Equality of Variances				T-test for equality of means					
		F	Sig.		df	Sig. (2 tailed)	Mean differen ce	Std. error differen	Differe	l of the
Most Preferre dICT	Equal variance assumed	.202	.655	633	56	.526	.66397	1.04862	2.764	1.4366
	Equal variance not assumed			621	34.09	.539	.66397	1.06872	2.835	1.5077

The result of Levene's test for equality of variances as shown in Table 12 is 0.20 which is grater than the 0.05 alpha level, hence, "Equal variances assumed" was used for the result. It is revealed that there is no significant difference in the scores for the statistical mean/standard deviation for female and male medical doctors in the use of ICT tools in the management of HIV/AIDS (Female $\{M=26.1, SD=3.9\}$ and Male $\{M=26.7, SD=3.7\}$; df=56, t=633, p-value =0.526). The null hypothesis is therefore accepted. This implies that there is no significant difference between gender and their use of ICT tools in the management of HIV/AIDS by medical doctors.

Table 13: T-test Analysis on Teaching Hospital and Use of ICT Tools in the Management of HIV/AIDS

	OR REEL VITERIO									
			G	roup S	tatistics					
	Gender	N		Mean		SD	Std I	n		
Most	OAUTH		36	2	6.9	3.6		59826		
Preferred	DELSUT	H	22	2	25.7	3.9		83820		
			Indepe	ndent S	Sample 7	-test				
		Lever Test for Equal Varian	or ity of			T-test	for equality	of means		
									95% Co Interval Differen	
			Sig.		df	Sig. (2 'tailed)		Std. error differen ce	Lower	Upper
Preferre	Equal variance assumed					.276	1.10859	1.00708	.90885	3.1260
	Equal variance not			1.07	41.40	.288	1.1085	1.02980	.97053	3.1877

The result of Levene's test for equality of variances as shown in Table 13 is 0.20 which is greater than the 0.05 alpha level, hence, "Equal variances assumed" was used for the result. It was also revealed that there is no significant difference in the scores for the statistical mean/standard deviation for medical doctors in Obafemi Awolowo University Teaching Hospital (OAUTH) and Delta State University Teaching Hospital DESLUTH) in the use of ICT tools in the management of HIV/AIDS (OAUTH {M=26.9, SD=3.6} and DELSUTH {M=25.7, SD=3.9}; df=56, t=1.101, p-value =0.27). The null hypothesis is therefore accepted. This implies that there is no significant difference between teaching hospitals and their use of ICT tools in the management of HIV/AIDS by medical doctors.

Discussion of Findings

Attitude towards remote monitoring, computer use, frequently searching health-related information, gender, and awareness towards remote monitoring; were significantly associated with willingness to use information technologies (Seboka, Yilma & Birhanu, 2021). The use of ICT by medical doctors in Nigeria from the findings of this study proved to be positive as they stated that they are willing to use ICT in the management of HIV/AIDS for the factors stated; such as, if there is training programme for the medical doctors and if government policies demands for ICT usage by medical doctors in their management of HIV/AIDS. As they are aware of the farreaching benefits the use of ICT can bring to their service delivery through ICT implementation.

Factors that can influence medical doctors use of ICT in health care service delivery includes but not limited to, training on ICT usage and designing of user friendly tools (Abayomi, & Ajao, 2020). Other factors that were found to be influencing factors on medical doctors use of ICT includes but not limited to: steady internet supply, elimination of medical administrative bottlenecks on access to medical information, steady power supply and availability of electronic medical records (EMR)availability of national database for HIV/AIDS patients and availability of personal computers in all medical doctors offices and homes. Medical doctors in Nigeria like their other counterparts, make effective use of ICT tools like electronic medical and health records (EMRs/EHRs), patient personal health records (PHRs), telemonitoring systems (using phone, mobile, and sensor-based technology), and web-based resources (e.g., educational sites and social networks) (Gray, Barnsley, Gagnon, ... & Wodchis, 2018). Specifically in Nigeria as found in this study, medical doctors use a host of ICT tools like mobile computers, Smart phones, Internet, databases, email and computers.

A multiplicity of factors have been found to militate against the adoption and use of ICT in healthcare service delivery, hence, the imperativeness for stakeholders to take appropriate actions by providing the needed and adequate ICT facilities in their institutions in order to aid better HIV/AIDS patients management (Ojo, Oluwatumininu, Ani, & Adedeji, 2021). Prominent among these factors are: the age, inefficiency in the use of computers, management disinterest, and poor ICT Infrastructure, gender, and ownership of a personal computer (Ojo, Oluwatumininu, Ani, & Adedeji, 2021). In this study, it was observed that high cost of internet subscription, lack of ICT tools provided by the hospital management, lack of ICT skills for effective application in the management of HIV/AIDS were found to be challenging factors hindering the use of ICT by medical doctors in the management of HIV/AIDS in Nigeria. Reiterating this, Awogbami, Opele, and Lawal, (2020) identified foremost barriers to ICT utilization in health information management to include "poor internet availability, inadequate funding, and poor electricity supply to the hospital, the cost of internet installation and maintenance". We put forward that the barriers to more innovative adoption of ICT are linked to: data access barriers, limited functionality of

available technology, and organizational and provider inertia (Gray, Barnsley, Gagnon ... & Wodchis, 2018).

Conclusion

From this study, it was observed that there is a general consensus on Nigerian medical doctors' willingness to use ICT in the management of HIV/AIDS irrespective of their gender. The study was able to reveal that there is a balance between male and female medical doctors in the use of ICT in the management of HIV/AIDS in Nigerian, as there is no significant relationship between the gender of Nigerian medical doctors and their use of ICT tools in the management of HIV/AIDS. Nigerian medical doctors make use of several ICT tools like mobile computers, Smartphone's, Internet, databases, email and personal computers for managing HIV/AIDS. It was also found that a number of factors such as high cost of Internet subscription, lack of ICT tools and skills militate against medical doctors' use of ICT among Nigerian medical doctors.

Recommendation

Based on the findings of this study, it is therefore recommended that:

- 1. medical doctors especially those managing HIV/AIDS, should be given adequate ICT training on the use of ICT.
- 2. steady Internet subscription, steady power supply, elimination of hospital administrative bottle necks on access to medical information, availability of medical databases and electronic medical records (EMRs) need to be addressed to enable Nigerian medical doctors effectively use ICT in the management of HIV/AIDS.

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