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Medical-Related Electronic Information Resources Provision For Effective Research Among Academic Staff Of Medical Schools In Federal Universities In North-Central, Nigeria

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ABSTRACT

The study investigated the medical-related electronic information resources provision for effective research among academic staff of medical schools in Federal Universities in North Central Nigeria. Descriptive research design was adopted for this study. The population of the study consists of all the five hundred and thirty-three (533) respondents. The population is made up of 530 academic staff in the three Federal Universities medical schools and 3 Library head of the three Medical Libraries under study. Purposive sampling technique was used to choose only three federal universities that offer medicine and also accredited in North Central, Nigeria, then total enumeration sampling technique was used because the entire population of academic staff in the three medical schools was considered small and manageable. The instruments for data collection were questionnaire and interview. The overall reliability coefficient (internal consistency) of the instrument was 0.82 which was considered high. Frequency counts and Percentages was used to analyses research question 1, while mean and standard deviation were used to analyse research question 2-4 with the aid of statistical package of social sciences (SPSS) version 22. The study found out that, the provision of medical-related electronic resources is low in the three medical schools with University of Ilorin medical school having the highest provision of electronic information resources. Major challenges associated with effective provision of medical-related electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria are financial constraint, irregular power supply, poor capacity building for e-library, poor electric power supply, inadequate functioning computers, lack of maintenance culture, and inadequate professional staff. The study recommended that, the medical school management should provide more fund for the library to subscribe for more medical-related electronic databases so that library can provide more electronic information resources to the academic staff to support their research activities

Keywords: Electronic Information Resources, Medical schools, Academic staff, Research, Universities

INTRODUCTION

The significant transformation caused by information technology in the 21st century has greatly influenced medical researchers' usage of electronic information resources. Electronic information resource has affected all aspects of information and has brought about enormous opportunities to the field of library and information science and the health sector. With the speed at which it provides medical researchers with the necessary information they need to carry out their research activities. The provision and use of electronic information resources to medical schools is a positive step toward making information widely available to medical researchers to access and use in order to enhance effective development in the health system of the country, most especially medical schools.

Research is the fundamental process of acquiring knowledge; it is a systematic enquiry to the world of the unknown in every field of human endeavour by professionals and experts in the field. According to Mole (2019) research is defined as a systematic enquiry aimed at providing adequate evidence upon which inferences, conclusions and solution to a research problem are arrived at. Mole furthered stated that research entails to search and search again until solution to the problem is found. Without research societal problems can never be solved, thus research is a problem solving activity. According to Walton (2019) medical research is very necessary in both developing and developed countries of the world because it increases knowledge regarding treatment, diagnosis and prevention of diseases, research is required in order to fight against diseases, reduce the economic cost of illness, extend life and improve health.

Medical research is very necessary in both developing and developed countries of the world because it increases knowledge regarding treatment, diagnosis and prevention of diseases, research is required in order to fight against diseases, reduce the economic cost of illness, extend life and improve health. Overall, research is aimed at improving the quality of life of the general population and specially the vulnerable groups. It is fundamental in lowering the morbidity and mortality of patients. It is important to say that Clinicians, non-clinicians and para-medical allied health personnel are in an unenviable position to conduct research and is a process geared to improve the quality of life of the general population, leading to a healthier gene pool. Ahmed (2016), explained medical research as "primary", wherein data is gathered; or "secondary", a process involving review or meta-analysis of the primary data. The primary research is a type of basic research, including experiments on animals or other models; biochemical, genetic, physiological, pharmacological, biotechnological, methodological and other investigations; population-based studies or surveys and finally, development or improvement in analytical procedures these primary studies generate the raw data required to make hypotheses or test-retest theories.

Academic staff in Nigerian universities, which include those in medical schools in North Central, Nigeria are behind in global research and publications despite the advantage brought by electronic information resources in research (Webometric ranking, 2022). Part of the causes of low research might be inadequate provision of electronic information resources which would affect the use of electronic information resources. The consequences of this problem is inadequate contribution to the frontier of knowledge through research among academic staff in medical schools or even cases of academic staff paying their colleagues to add their name to a publication which is unethical. To resolve these consequences and ensure that academic staff in Medical schools in North Central Nigeria enhance the level of their research it is necessary to examine the extent of provision of electronic information resources and the consequent use of these electronic information resources among academic staff for research in Medical schools as little or no attention was given to these group in most of the existing studies on provision and use of electronic information resources for research among academic staff.

Electronic information resources are information in digital form. Electronic resources can be viewed as resources which require computer access or any electronic product that delivers a collection of data, be it text referring to full-text databases, electronic journals, image collections, other multi-media products and numerical, graphical or time based as a commercially available title that has been published with an aim to be marketed (Dhanavandan and Tamizhchelvan, 2012). According to Johnson Evensen, Gelfand, Lammers, Sipe and Zilper, (2012) electronic information resources encompass e-journals, e-books, online

databases, e-theses/e-dissertations and online public access catalogues (OPACs). Ani and Edem (2012), defined electronic information resources as online information that are being stored in an electronic format such as PDF, DOC, PPT, MP4 among others. Ngeme (2017) stated that Electronic Information Resources are computer mediated information resources in electronic form that are available for use among librarians in universities. It is also a broad term e-resources include a variety of publishing models, including online databases, OPACs, electronic link, e-journals, wireless publishing, CD-ROMs, e-books, Print-On-Demand (POD), internet resources, e-mail publishing and web publishing among others.

Electronic information resources consist of information resources provided in electronic formats such as CDROM databases, e-books, e-journals, Online database, Online Public Access Catalogues, and other computer-based electronic networks. According to Madondo (2017), electronic information resources are documents that need computer access, whether through a desktop computer, mainframe, or portable mobile devices that may be viewed locally or remotely through the internet. They asserted that electronic information resources facilitate learning, teaching, and research. According to Okilagwe, (2018), any electronic product that supplies a collection of data, including an image collection or other multimedia products, is an electronic information resource. According Tariq & Waseem-Zia (2014) electronic resources refer to those materials that require computer access, whether through a personal computer, mainframe, or handheld mobile device. They may either be accessed remotely via the internet or locally. Dictionary of library and information science (2019) defines electronic resources as materials consisting of data and/or computer program(s) encoded for reading and manipulation by a computer, such as a CD-Rom drive or remotely via network such as the internet by use of a peripheral device directly connected to the computer.

Some of the most frequently encountered types are e-journals, e-books, full-text databases, indexing and abstracting databases, reference databases, numerical and statistical databases, e-images, and e-audio-visual resources. The electronic resources are completely immersed in our university environment. Electronic information resources are provided in electronic form, and these include CD-ROM database, online databases, online journals, OPACs, Internet and other computer-based electronic networks (Shuling, 2017). Electronic information resources such as electronic journals, electronic books, Online Public Access Catalogs (OPAC), web public access catalogs (Webpack), CD-ROM, electronic mail, e-data archives, e-manuscripts, e-maps, e-magazines, e-thesis, e-newspaper, e-research reports, e-bibliographic databases, e-reference sources, and other educational sources that are beneficial to scholars and researchers, (Iroaganachi & Izuagbe, 2018). These types of electronic information resources and more are expected to provide updated information and breakthroughs in different field of study to facilitate effective research.

With the usage of electronic information resources, academic staff in medical schools now have access to information outside of the actual walls of the university library. Due to its capacity to disclose research findings more quickly and to enable remote access without geographical restrictions, electronic information resources have grown in popularity and are now considered "must use" by research scholars (Iroaganachi & Izuagbe, 2018). Furthermore, electronic information can be stored, processed, and retrieved from e-sources far more quickly than it can from traditional print documents. Unquestionably, the availability of information through electronic media has improved accessibility to information on a global scale, increased service speed, increased the number of users served, increased the quantity and thoroughness of information provided, and provided academic staff with new and exciting opportunities to find information about their research areas.

Provision refers to the process of making something available for use. It can also refer to the process of supplying something to meet a particular need. The word 'provision' is the act or process of supplying or providing something while the word 'use' is the act of using something. For effective usage of electronic information resources, it has to be provided and made available and accessible to academic staff. Provision of electronic information resources refers to the process of making electronic information resources available for use. Huge amount of information is been provided and made available and

accessible to scholars via the internet, it is very important to know that access to relevant information is vital for academic staff to take effective and efficient decision in his/her research.

This view is affirmed by Okon, Patrick and Bosire (2015) that provision of electronic information is needed “for problem solving and decision making” in research process. Onwih (2021) found out that, university libraries are providing current and relevant electronic information resources to meet the research information needs of staff. According to Ahmad (2016) the types of electronic information provided to academic staff to facilitate their research activities are e-maps, e-magazines, e-thesis, e-newspaper, e-research reports, e-bibliographic databases, e-reference sources, electronic journals, electronic books, Online Public Access Catalogs (OPAC), web public access catalogs (Webpack), CD-ROM, electronic mail, e-data archives, and e-manuscripts.

The provision and use of electronic information resources has advanced research. This is because electronic information resources have shown the capability to meet the crucial research information needs of academic staff in Nigerian universities when adequately provided and used for research. Thus, any academic staff who aims to produce quality research must use electronic information resources as it offers access to global information with little or no stress and at a very low cost. Preliminary investigation and existing studies have shown that, academic staff in Nigerian universities, which include those in medical schools in North Central, Nigeria are lacking behind in global research and publications despite the advantage brought by electronic information resources in research (Webometric ranking, 2022). The implication of this problem is inadequate contribution to the frontier of knowledge through research among academic staff in medical schools or even cases of academic staff paying their colleagues to add their name to a publication which is unethical.

Purpose of the Study

The purpose of the study is to investigate the medical-related electronic information resources provision for effective research among academic staff of medical schools in Federal Universities in North Central Nigeria. The specific objectives are:

1. Ascertain the types of medical-related electronic information resources provided to academic staff of medical schools in federal universities in North Central Nigeria
2. Find the sources of provision of medical-related electronic information resources in academic staff of medical schools in federal universities in North Central Nigeria.
3. Determine the challenges associated with provision of medical-related electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria
4. Proffer possible strategies that could enhance the provision of medical-related electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria.

Research Questions

The following research questions will guide the study.

1. What are the types of electronic information resources provided to academic staff of medical schools in federal universities in north central Nigeria?
2. What are the sources of provision of electronic information resources for academic staff of medical schools in federal universities in north central Nigeria?
3. What are the problems associated with effective provision of electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria?
4. What are the possible strategies that could be used to enhance effective provision of electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria?

LITERATURE REVIEW

In order to discuss the research in medical school, it is imperative to first and foremost discuss research in its general usage. Research is an enquiry into the unknown. It is the search for solutions to problems or

answers to questions. Knowledge is enlarged through research, hidden information is revealed and knowledge gaps are filled (Nworgu, 2015). Research is defined as human activity based on intellectual application in the investigation of matter. The primary purpose for applied research is discovering, interpreting, and the development of methods and systems for the advancement of human knowledge on a wide variety of scientific matters of our world and the universe. Research can use the scientific method, but need not do so (Smart, 2014). Research comprises defining and redefining problems, formulating hypothesis or suggesting solutions; collecting, organizing and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis (Hyperdictionary, 2020). Mole (2019) defined research as a science of knowledge through investigation which is concerned with systematic way of finding information on an issue or object.

Electronic information resources has become very important for all academic activities such as teaching, learning and research because of the speed at which it enhance academic activities.it is important to note that electronic information resources has brought information seekers and knowledge more closely because is more productive and more user-friendly compare to the printed information resources' Watts and Ibegbulam (2015) describe electronic information resources or simply electronic resources (e-resources) are information stored in electronic format in computer or computer related facilities (CD-ROMs, flash drives, digital libraries or the Internet). This is consistent with the description of electronic information resource as a generic term "for electronic information stored both offline or online" Thanuskodi (2017). Meanwhile, Prakash (2015) view electronic resources is a pieces of information store in a form of electronic signals and is usually found on computer, he further explains that electronic resources are those materials that require computer access, whether through a personal computer, mainframe or handheld mobile device.

The provision of medical library information services to student, researchers and academic staff at the medical schools, therefore, is a necessity because access to and ability to effectively use information among academic staff in the medical schools is the single most important factor by which Nigeria medical schools can remain the best and among the leading medical schools in Africa and achieve its dream to emerge among the best in the world. Furthermore, Gwang (2011) noted that strategies for meeting the current challenges to providing library and information services to Nigerians begin with the library and information professionals themselves. These professionals must vigorously adopt proactive approaches to library and information provisions. It is their responsibility to correct the prevailing unhealthy state of library and information practice, which is predominantly passive or reactive. Ukachi (2010) stated that the provision of library and information services to a large extent is dependent upon the kind of library in question. The information services provided by the various types of libraries are usually community of user oriented, that is, each library provides information targeted at satisfying the information needs of its unique community of users. For instance, medical library is primarily concern with providing information and services that will enhance effective and efficient reading, teaching, learning and research among academic staff of the medical school.

In an empirical study, Krishnamurthy and Reddy (2018) examined Provision of E-resources in Engineering College Libraries in India and found that, majority of the librarians are providing digital library services in spite of lack of support from the management and also the diminishing demand of library users. In another study, Isiakpona and Ifijeh (2012) evaluated the availability of electronic resources for service provision in university libraries in Ogun State Nigeria and how they affect the effective provision of electronic information resources in selected University libraries South West Nigeria. The study found university libraries have electronic databases; however, the most common of the databases was AGORA while IEE was the least common. The study also revealed that majority of the University libraries have adequate basic infrastructure for effective electronic information services and the major challenge involved in the provision of electronic resources among the university libraries was electricity power outage.

The factors militating against the provision and use of electronic information resources for research are inadequate electronic information resources, unsteady electric power supply, low digital skills among Librarians, low internet connectivity and bandwidth (Yunisa, 2019). According to Adeniran (2013) some factors that impede effective provision and use of electronic information resources are large mass of irrelevant electronic information resources online, Inadequate professional skills to filter the results from online search, download delay due to low internet bandwidth, and inadequate or lack of search skills. Similarly, Gakibayo (2013) found that the provision and use of electronic information resources was constrained by inadequate computers connected to the internets in the university libraries, Inadequate internet literacy skills, and slow internet connectivity. In another study, Bamidele & Adekanmbi (2019) found out that the major factors associated with the provision and use of electronic information resources are slow network connection, power failure, viruses attack, and irregular subscription to renowned journal issues due to inadequate fundings of the university libraries.

Other factors are poor management of electronic information resources in the university libraries. Tariq and Zia (2014) reported that some major factors affecting the provision and use of electronic information resources are low speed internet, erratic power supply and inadequate funding of the university libraries. Ayodele (2017) in his presentation at the Nigerian Library Association (NLA) conference examined some factors affecting effective use of electronic information resources which include: software development- The problems associated with sourcing of foreign software, the dumping of some on each unit of the library, the endless downtime due to poor management among others, High cost of Electronic information resources, mismanagement of funds has been the order of the day in Nigerian system also Staff and users attitude towards electronic systems are hampering the development of electronic information resources.

It is also important to note that researchers in developing country like Nigeria don't fully utilized electronic information resources due to poor power supply, inadequate trained cyber-librarians attending to the need of the library clients, poor internet service, poor research environment and some librarians are not aware of the existence of electronic resources more specially database are among the primary reasons for their underutilization. Ibrahim (2014) also itemized some factors hindering utilization of e-resources which include poor skills, lack of knowledge about the resources, lack of publicity, insufficient time to use the services and lack of computer training coupled with an inadequate training to use on-line resources and services were other reasons that contribute to the low usage.

Electronic information resources have much to offer researchers especially in medical schools in Nigeria because they are dynamic and fascinating. Sajane (2017) noted that e-resources can be accessed simultaneously from infinite points by a great number of audiences if been provided which means information service should not be limited to the provision of current information sources only it should include the provision of new services and greater access to the resources in order to enhance research among scholars. Ibrahim (2014) was of the opinion that more relevant electronic information resources should be made available for use by the library customers. Database containing information in different field of studies should be made available, e-resources such as e-journals, e-books, e-thesis/dissertations among others should be made available to researchers.

Gwang (2011) was of the opinion that Planning for the effective provision and use of electronic information resources must be done strategically. It must also exhibit innovation and creativity, taking into account not only existing needs but also anticipated future requirements associated with growth and increasing modernization. These considerations relate to all aspects. Cyber-Librarians like physicians or any other professionals, must diagnose the information needs, plan and then implement the service which meets these needs. performance should be evaluated periodically in the light of the needs in order to take any necessary corrective measures. Proper planning for effective provision and use of electronic information resources must be done effectively and strategically, creativity and innovation should be included. Furthermore, Ayodele (2007) was of the opinion that Information Technology (IT) is not cheap therefore good funding is needed to sustain an uninterrupted and qualitative flow of information, this was

seconded by Edem, and Egbe (2016) adequate budgetary allocation should be given to the university libraries for subscription to online databases and acquisition of electronic information resources. Furthermore, the issue of giving out purchase and supply contracts to relations, family friends and colleagues who lack the necessary expertise should be checked. Universities should also ensure high internet connectivity, provide adequate computer and introduce adequate use of electronic resources and other audio-visual resources that can help to address the information need of users Doosuur (2012). More so a monitoring team should be set up by the university and library management to monitor and supervise the effective use and maintenance of the electronic resources and its facilities.

RESEARCH METHODS

Descriptive research design was adopted for this study. The area of the study is North Central States of Nigeria and the Federal Capital Territory Abuja, North Central States is made up of Benue, Kwara, Kogi, Nasarawa, Niger and Plateau States and the Federal Capital Territory (FCT) Abuja. The study covered three federal universities that offer medicine and are accredited by National University Commission and Medical and Dental Society of Nigeria: They are University of Ilorin in Kwara State, University of Jos in Plateau State and University of Abuja in the Federal Capital Territory of Nigeria. North central Nigeria was chosen for the study because the webometric ranking of universities in the geopolitical zone is very poor. From the foregoing analysis and considering the fact that research productivity of academic staff contributes to the ranking, there is need to examine how the provision of medical-related electronic information resources can improve the research productivity of academic staff who are obviously not performing like their counterparts in other geopolitical zones in Nigeria.

The population of the study consists of all the five hundred and thirty-three (533) respondents. The population is made up of 530 academic staff in the three Federal Universities medical schools and 3 Library head of the three Medical Libraries under study. Purposive sampling technique was used to choose only three federal universities that offer medicine and also accredited in North Central, Nigeria, then total enumeration sampling technique was used because the entire population of academic staff in the three medical schools was considered small and manageable. The instruments for data collection were questionnaire and interview. The overall reliability coefficient (internal consistency) of the instrument was 0.82 which was considered high. Frequency counts and Percentages was used to analyses research question 1, while mean and standard deviation were used to analyse research question 2-4 with the aid of statistical package of social sciences (SPSS) version 22.

RESULTS

The sub-section deals with the presentation of data collected from the field through observation checklist, questionnaire and Interview. The presentation and analysis were based on the research questions guiding the study.

Research Question 1: *What are the types of medical-related electronic information resources provided to academic staff of medical schools in federal universities in north central Nigeria?*

Table 1: Responses on the types of medical-related electronic information resources provided to academic staff of medical schools in federal universities in North Central Nigeria

S/N	Medical-based electronic information resources	UNIABUJA		UNIJOS		UNIILORIN	
		P	NP	P	NP	P	NP
1	PubMed Central	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)	0(0%)
2	PubMed	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)	0(0%)
3	MedlinePlus	74(100%)	0(0%)	231(93.9%)	15(6.1%)	181(100%)	0(0%)
4	Cochrane Library	0(0%)	74(100%)	222(90.2%)	24(9.8%)	181(100%)	0(0%)
5	MEDLINE	70(94.6%)	4(5.4%)	0(0%)	246(100%)	181(100%)	0(0%)
6	EBSCOHost	74(100%)	0(0%)	0(0%)	246(100%)	181(100%)	0(0%)
7	National Library of Medicine	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
8	Embase	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
9	BioMed Central	74(100%)	0(0%)	219(89%)	27(11%)	181(100%)	0(0%)

10	UpToDate	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
11	Public Library of Science (PLOS)	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
12	National Center for Biotechnology Information (NCBI)	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
13	BIOSIS Preview	0(0%)	74(100%)	0(0%)	246(100%)	181(100%)	0(0%)
14	AccessMedicine	0(0%)	74(100%)	0(0%)	246(100%)	181(100%)	0(0%)
15	ClinicalKey	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
16	e-books	72(97.3%)	2(2.7%)	237(96.3%)	9(3.7%)	0(0%)	181(100%)
17	Reference database	0(0%)	74(100%)	246(100%)	0(0%)	0(0%)	181(100%)
18	e-thesis/dissertations	74(100%)	0(0%)	0(0%)	246(100%)	181(100%)	0(0%)
19	Statistical database	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
20	Indexing and abstracting database	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
21	CD-ROM	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
22	Image collection	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
23	Multimedia product	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
24	e-clipping	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
25	e-patents	0(0%)	74(100%)	0(0%)	246(100%)	0(0%)	181(100%)
	Total Electronic Resources Provided	8		7		10	

Keys: P: Provided; **NP:** Not Provided;

Data from table 1 shows that, University of Abuja medical school, library provides PubMed Central, PubMed, MedlinePlus, MEDLINE, EBSCOHost, BioMed Central, e-books, and e-thesis/dissertations to academic staff. University of Jos medical school, library provides PubMed Central, PubMed, MedlinePlus, Cochrane Library, BioMed Central, e-books, and Reference database to the academic staff; while University of Ilorin medical school, library provides PubMed Central, PubMed, MedlinePlus, Cochrane Library, MEDLINE, EBSCOHost, BioMed Central, BIOSIS Preview, AccessMedicine, and e-thesis/dissertations to academic staff. This shows that University of Ilorin medical school, library provides 10 medical based online databases to the academic staff; University of Jos medical school, library, provides 8; while the University of Abuja medical school, library provides 7 medical based online databases to the academic staff.

Responses from the interview with the head of medical school libraries shows that, the three medical school libraries provide PubMed Central, PubMed, MedlinePlus, MEDLINE, EBSCOHost, BioMed Central, and e-thesis/dissertations to the academic staff to support their research activities. On the contrary, medical related electronic information resources such as National Library of Medicine, Embase, UpToDate, Public Library of Science (PLOS), National Center for Biotechnology Information (NCBI), BIOSIS Preview, AccessMedicine, ClinicalKey, Statistical database, Indexing and abstracting database, Image collection, Multimedia product, e-clipping, and e-patents are not provided.

Research Question 2: *What are the sources of provision of medical-related electronic information resources for academic staff of medical schools in federal universities in north central Nigeria?*

Table 2: Mean Response on the sources of provision of medical-related electronic information resources for academic staff of medical schools in federal universities in north central Nigeria

S/N		UNIABUJA		UNIJOS		UNIILORIN		Overall		
		\bar{x}	SD	\bar{x}	SD	\bar{x}	SD	\bar{x}	SD	D
1	National University Commission (NUC)	3.20	0.64	3.51	0.63	3.40	0.55	3.37	0.61	Agree
2	Donation	3.08	0.61	3.58	0.56	3.41	0.58	3.36	0.58	Agree
3	Open internet sources	3.08	0.68	3.51	0.56	3.45	0.58	3.35	0.61	Agree
4	Subscription	2.89	0.77	3.53	0.58	3.47	0.58	3.30	0.64	Agree
5	Non-Governmental Organization NGO's	2.96	0.56	3.52	0.62	3.34	0.63	3.27	0.60	Agree
6	Purchase	3.16	0.62	3.07	0.72	3.22	0.60	3.15	0.65	Agree
7	Database	3.20	0.72	3.07	0.49	3.05	0.40	3.11	0.54	Agree

8	Gift	2.68	0.87	3.12	0.61	3.18	0.57	2.99	0.68	Agree
9	CD ROM	2.68	0.91	2.94	0.62	2.96	0.58	2.86	0.70	Agree
10	Consortium	2.80	0.92	2.82	0.65	2.83	0.64	2.82	0.74	Agree

Data from table 2 shows that, the major sources of electronic information resources in the medical school libraries are National University Commission (NUC), Donation, Open internet sources, Subscription, Non-Governmental Organization NGO's, Purchase, Database, Gift, and Consortium with mean ranging from 2.82-3.37 were all accepted as sources of provision of electronic information resources for academic staff of medical schools in federal universities in north central Nigeria. The least source is Consortium, with 2.82 mean score.

Responses from the interview shows that the medical school libraries mostly source for electronic information resources through gift, national university commission, non-governmental organisation, donations, subscription, and open source. Only University of Ilorin medical school library source for electronic information resources through consortium.

Research Question 3: *What are the problems associated with effective provision of medical-related electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria?*

Table 3: Mean Response on the problems associated with effective provision of medical-related electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria

S/N	Items	UNIABUJA		UNIJOS		UNIILORIN		Overall		
		\bar{x}	SD	\bar{x}	SD	\bar{x}	SD	\bar{x}	SD	D
1	Financial constraint	3.55	0.58	3.24	0.68	3.38	0.72	3.39	0.66	Strongly agree
2	Irregular power supply	3.54	0.67	2.53	0.76	2.52	0.81	2.86	0.75	Strongly agree
3	Poor capacity building for e-library	3.28	0.69	2.44	0.74	2.51	0.81	2.74	0.75	Strongly agree
4	Nonchalant attitude of management	2.74	0.78	2.34	0.62	2.30	0.62	2.46	0.67	Disagree
5	Lack of professional skills	2.31	0.98	2.23	0.62	2.22	0.63	2.25	0.74	Disagree

Data from table 3 shows that the overall major problems associated with effective provision of electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria are financial constraint, Irregular power supply, and Poor capacity building for e-library, with 3.39, 2.86, and 2.74 mean score respectively. However, Poor capacity building for e-library is not a major challenge in University of Jos. Also, nonchalant attitude of management, and Lack of professional skills, with 2.46 and 2.25 overall mean score are not major challenges in University of Jos and University of Ilorin medical schools.

Responses collected through interview with the head of medical school library in the three federal universities studied shows that the major challenges the library and librarians encounters in the provision of electronic information resources to academic staff to support their research output are poor electric power supply, inadequate functioning computers, lack of maintenance culture, and inadequate professional staff.

Research Question 4: *What are the possible strategies that could be used to enhance effective provision of medical-related electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria?*

Table 4: Mean Response on the possible strategies that could be used to enhance effective provision of medical-related electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria

S/N	Strategies	UNIABUJ		UNI JOS		UNI ILORI		Overall		
		\bar{x}	SD	\bar{x}	SD	\bar{x}	SD	\bar{x}	SD	D
1	Adequate fund should be made available	3.78	0.48	3.57	0.63	3.59	0.68	3.65	0.60	Strongly agree
2	Conducive building for e-library should be provided	3.68	0.66	3.56	0.71	3.54	0.76	3.59	0.71	Strongly agree
3	Management should ensure the necessary facilities needed by the e-library is adequately provided.	3.64	0.54	3.55	0.77	3.48	0.92	3.56	0.74	Strongly agree
4	e-library Professionals should be train and made available to manage the e-library and also assist library users were necessary	3.54	0.50	3.49	0.87	3.39	0.98	3.47	0.78	Agree
5	Consistent Power supply should be made available	3.89	0.31	3.50	0.77	3.44	0.86	2.61	0.65	Agree

Data from table 4 shows that the major strategies that could be used to enhance effective provision of electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria are Adequate fund should be made available, Conducive building for e-library should be provided, Management should ensure the necessary facilities needed by the e-library is adequately provided, e-library Professionals should be train and made available to manage the e-library and also assist library users were necessary, and Consistent Power supply should be made available, with mean score ranging from 2.61-3.65 which all indicates acceptance among the respondents.

Responses from interview with the head of the medical school libraries shows that, adequate funding of the medical school libraries, proper maintenance culture, creating awareness of available electronic resources, stable electric power supply, and provision of telecommunication infrastructures are the major strategies to enhance the provision of electronic information resources to the academic staff.

DISCUSSION OF THE FINDINGS

The findings of the study revealed that, there is inadequate provision of electronic information resources to academic staff of medical schools in federal universities in North Central Nigeria. The result revealed that very few medical-based electronic information resources presented were provided in University of Abuja medical school, University of Jos medical school, and University of Ilorin medical school. It was revealed that, University of Abuja medical school, library provides PubMed Central, PubMed, MedlinePlus, MEDLINE, EBSCOHost, BioMed Central, e-books, and e-thesis/dissertations to academic staff. University of Jos medical school, library provides PubMed Central, PubMed, MedlinePlus, Cochrane Library, BioMed Central, e-books, and Reference database to the academic staff; while

University of Ilorin medical school, library provides PubMed Central, PubMed, MedlinePlus, Cochrane Library, MEDLINE, EBSCOHost, BioMed Central, BIOSIS Preview, AccessMedicine, and e-thesis/dissertations to academic staff.

The finding is in accordance with that of Vinitha (2014) who found out in an earlier study that the provision of electronic information resources are low in Nigerian university libraries due to many challenges. Vinitha (2014) further found out that only few of the electronic information resources are provided to users. The finding of the study is also in accordance with the findings of Edem and Egbe (2016) who in a similar study on the availability and utilization of digital information resources for research in the University of Calabar Library, found out that, there are inadequate digital information resources in University of Calabar Library. This is not surprising as most Nigerian libraries are not well equipped with state-of-the-art technology to provide adequate electronic information resources. Sometimes these libraries subscribe to electronic databases during accreditation or resource assessment.

The findings of the study revealed that, the major sources of electronic information resources in the medical school libraries are National University Commission (NUC), Donation, Open internet sources, Subscription, Non-Governmental Organization NGO's, Purchase, Database, Gift, and Consortium. The findings of the study is in accordance with the findings of Ani and Edem (2012) who earlier found out that open-source access, subscription, National University Commission (NUC), gift, donation, and Consortium are the major source of acquisition of electronic information resources in Nigerian university libraries. These sources of provision of electronic information resources, most especially open-source access and subscription are very common as the major sources of acquisition of electronic information resources in most university libraries in Nigeria. This confirms the findings from the interview, where the head of medical libraries studied responded that open-source access and subscription are the two major sources of acquisition of medical related electronic information resources.

The findings of the study revealed that, major problems associated with effective provision of electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria are financial constraint, Irregular power supply, Poor capacity building for e-library, poor electric power supply, inadequate functioning computers, lack of maintenance culture, and inadequate professional staff. The findings of the study is in accordance with the findings of Gakibayo (2019) who in an earlier study found out that, use of electronic resources and services was constrained by lack of computer and information literacy skills, inadequate number of computers and slow internet connectivity. Similarly, the findings of the study further support the findings of Isiakpona and Ifijeh (2012) who reported that, the major challenge involved in the provision of electronic resources among the university libraries was electricity power outage. These challenges most especially poor electric power supply is a popular challenge affecting use of any electronic resources and technologies in Nigeria.

The findings of the study revealed that, major strategies that could be used to enhance effective provision of electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria are adequate funding of the medical school libraries, proper maintenance culture, creating awareness of available electronic resources, stable electric power supply, and provision of telecommunication infrastructures, e-library professionals should be train and made available to manage the e-library and also assist library users were necessary. The finding is in accordance with that of Adebayo (2019) whose earlier study found out that, constant power supply, standard internet connectivity, adequate workstation computers, adequate telecommunication facilities, Provision of adequate technological infrastructures in the university libraries are some of the strategies to enhance the use of electronic information services. This finding is also in accordance with that of Mole (2017) who found out that maintenance of uninterrupted power supply, provision of enough computers in the library; constant upgrade of server's bandwidth, the subscription cost of online information resources is discouraging, as the strategies for improving the use of online information resources.

CONCLUSION

Electronic information resources provide current, and up-to-date information in a particular field of study for academic staff to use and improve their research. The study examined the provision of medical-related electronic information resources for effective research among academic staff of medical schools in Federal Universities in North Central Nigeria. Based on the findings it was concluded that the provision of medical-related electronic resources is low in the three medical schools with University of Ilorin medical school having the highest provision of electronic information resources. It was also concluded that the medical school libraries sources for electronic information resources through National University Commission (NUC), Donation, Open internet sources, Subscription, Non-Governmental Organization NGO's, Purchase, Database, Gift, and Consortium. Major challenges associated with effective provision of medical-related electronic information resources by academic staff of medical schools in federal universities in North Central Nigeria are financial constraint, irregular power supply, poor capacity building for e-library, poor electric power supply, inadequate functioning computers, lack of maintenance culture, and inadequate professional staff. Further study should be conducted on, Demographic variables as correlates to use of medical-related electronic information resources for enhanced research productivity of academic staff of medical schools in North Central, Nigeria.

RECOMMENDATIONS

The following recommendations were suggested by the researcher:

1. The medical school management should provide more fund for the library to subscribe for more medical-related electronic databases so that library can provide more electronic information resources to the academic staff to support their research activities
2. The medical school libraries should explore more electronic information resources through open-source access and through institutional cooperation so as to acquire more electronic information resources to provide to the academic staff of the medical schools to support their research activities.
3. The management of the medical schools should employ more professional librarians with digital skills to facilitate the provision of electronic information resources through the difference online service delivery so as to support the research activities of the academic staff
4. The medical school libraries should train and retrain their staff to effectively provide the available electronic information resources to the academic staff
5. The medical school management should ensure that the campus have steady electric power supply to facilitate effective provision and use of electronic information resources

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