

The Use of Open Access by Medical Librarians in Nigeria: A Survey of Knowledge and Practices

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Abstract

Open access (OA) publications on the Internet are increasing and assuming important routes for disseminating scholarly information. Consequently, Open access management has become an inescapable feature of modern library services. The study examined knowledge of open access models, licensing types, resources, and practices in medical libraries in Nigeria. Questionnaire was the instrument for data collection. Participants were Fifty-one librarians from thirty-six medical libraries. Result shows high (72.5 percentage) awareness of open access green, gold, hybrid models, creative commons and public domain licensing types. However, less than half understand the full meaning and implementations of the models. Understanding was higher for OA licensing types. There was also high awareness of OA databases and resources but low use of the resources for information services. Open access services offered by the respondents are creating links to open access databases on library websites and directing patrons to OA publications. The study concludes that medical librarians need to improve

their knowledge and skills of open access management to enable them build diverse collections that are relevant to Medical library patrons in the digital age.

Keywords: Open Science, OA, Open Access Management, Scholarly Communication, Medical Libraries, Health Science Librarians

Introduction

Open access (OA) publications on the Internet are increasing and assuming important routes for disseminating scholarly information. From predominantly subscription-based journals and books, medical libraries are now inundated with collection and management of various open access journals, books and resources. Open science is the movement to make online scientific research and data freely accessible to all without restrictions to their use and distribution. Open data and open access are forms of the open science movement. Open access is a generic term that describes free access to online peer reviewed publications such as journal articles, books and other knowledge publications, distributed without licensing restrictions enabling users unlimited use and sharing. Open access (OA) publications are propelled by legal rights that enable them to be freely accessed, distributed, shared and used on the Internet by anyone, anywhere, irrespective of location, without infringement of copyright laws and therefore users are free from legal repercussions.

Some of the enabling licensing types are creative commons licences and non-licenced works in public domain. Many of these publishers of open access journals recoup cost and maintain their business through article processing charges (APC) where authors pay stipulated fees determined by the publishers for publication of their articles.

Open access is proving beneficial to knowledge transfer in various aspects. “They bring the results of academic research to unprecedented numbers of scientists, university lecturers, medical researchers, patients, inventors, students, and the general public—democratising access to knowledge, accelerating discovery and fueling” (Open Society Foundations, nd.). According to Swan, (2012) “Through open access, researchers and students from around the world gain increased access to knowledge; this leads to opportunities for equitable economic and social development, intercultural dialogue, and has the potential to spark innovation. Publications receive greater visibility and readership, and the potential impact of research is heightened.”

There are various models of open access publishing which are categorised by nature and timing of removal of legal restrictions to the access. The terms Gold, Green, Hybrid and Bronze OA represents the various models of open access. Publishers of peer reviewed Gold Open Access journals provide immediate open access to all articles on their websites and they are freely accessible to all who have access to the Internet. Green Open Access is the model of an author, self-archiving a version of non-open access article or its preprint in an open access repository such as institutional repositories. Hybrid open access is an open access model where publishers of a subscription journal provide gold open access for some articles while others are for subscription.

Managing Open Access Scholarly Publications in Medical Libraries

Open access publications relevant to all specialties of health sciences are dispersed in numerous web portals. The open access movement is boasted by availability of online repositories and databases that index and archive open access publications and provide search features for easy retrieval of content. *PubMed Central* is the National Library of Medicine digital archive of open and freely accessible articles and books in biomedical sciences. Directory of Open Access Journals (DOAJs), Directory of Open Access Books, Open Access Theses and Dissertations, Directory of Open Access Repositories (DOAR), etc are OA repositories that

are having a general subject scope but are relevant to the collection of medical libraries because they also index health science literature. Bentham Open and Scientific Research Publishing are open access scientific and biomedical publishers.

Librarians engage with the open access movement through curation of resources and collection management. Institutional repositories are tools that are used to archive intellectual outputs of an institution including open access publications for greater visibility. It is the duty of librarians to scan the online environment to identify potentially useful open access resources that may be required by the patrons. These contents and links are disseminated through library facilities such as websites. Records and links are also included in discovery tools, online public access catalogue (OPAC) and electronic resource lists. Free electronic collections are capable of enriching a library’s collection especially for those with limited budget for resource acquisition. Librarians can download free and open access e-books and other resources without copyright restriction to build local repositories according to the needs of the users (Anyaoku, 2019).

Knowledge of sources of open access resources, electronic resource acquisition, cataloguing, web content management, copyrights laws and open access models are important part of the competencies required for collection and management of open access resources. When scanning the online environment to identify relevant open access resources. Librarians by the nature of their duty as copyright protectors, need to understand the copyright indices governing open access and how to differentiate between open access, subscription-based and online pirated resources. There is a high rate of pirating of electronic publications; with about four million e-books pirated online (The Society of Authors, 2019). The knowledge of legitimate sources and illegally copied publications will prevent them from violation of copyright laws and protect the libraries from legal repercussions. Knowledge of open access management will also assist the librarians to manage. The purpose of the study was therefore to determine awareness and knowledge of the open access models and licensing as well as OA practices in medical libraries in Nigeria.

Research Questions

The following questions guided the research:

1. What is the level of awareness and knowledge of open access publishing models and licensing by medical librarians in Nigeria?
2. What is the level of awareness of open access resources by the medical librarians?
3. What is the level of use of open access resources to offer information services?
4. What are the open access practices in the medical libraries?
5. What are the medical librarians' sources of knowledge acquisition on open access management?

Literature Review

Open access licensing

A licence is a legal instrument that stipulates how creative outputs can be used and distributed. These rights usually give the creator an exclusive right over the use and distribution of the work for a certain period. Proprietary or subscription-based works are protected by intellectual property rights such as copyrights, patents, trademarks and industrial property rights. These are licences granted to persons to exclusively own and control the distribution of their creative outputs or inventions. According to Bailey, this means that others cannot copy the work, distribute it, publicly display/perform the work or create derivative works of it without the permission of the creator or rights holder (Bailey, 2018).

Copyright is an intellectual property right given to the originator of intellectual output such as books, journal articles, films, music for a fixed number of years, to exclusively print, publish, perform, film etc. the creative output. Copyright infringement or piracy is the use of works protected by copyright law without permission. Copyright is founded on the principle that authors own the right to their intellectual creations and can determine whether, and under what conditions, others may use their works. Copyright law enables authors to monetise their work, underpinning the publishing and creative industries as a whole. Copying an author's work

without consent, offering it for sale and downloading it are all copyright infringements (*The Society of Authors*, 2019).

As noted, Open access (OA) publications are driven by legal rights that enable them to be freely accessed, distributed and used on the Internet without infringement of copyright laws. Creative Commons licences are open access licences that are designed to enable creators retain copyright while allowing others to copy, distribute, and use of their works — at least non-commercially. Every Creative Commons licence also ensures licensors get the credit for their work they deserve (<https://creativecommons.org/licenses/>). Bailey (2018) explained that the Creative Commons Organisation created a series of licences that creators and rights holders can place on their work to indicate that they permit certain reuses. The licences include three elements: An icon or short text line indicating the licence, a “human readable” version of the licence (example) and the full legalese version. These licences are made available free and can even be integrated within a site, such as YouTube or Flickr, to enable the site to make the licences available to their users.

Materials on public domain are not protected by intellectual property laws such as copyright, trademark, or patent laws. Anyone can use a public domain work without obtaining permission from the original owner. Works fall into a public domain because the intellectual property rights have expired, it never had copyright protection the work was explicitly donated to the public domain and the work is a work of the U.S. Government (Open Education Resources, nd). Works in Public domain can be an important part of library collections. Libraries can digitise relevant print resources in public domain and upload to their digital archives or freely create hyperlink on the website and OPAC so that they can be freely accessed by their patrons who might need them.

Librarians' Engagement with Open Access

Open access (OA) publications on the Internet are increasing and assuming important routes for disseminating scholarly information. Consequently, OA management has become an inescapable feature of modern library services. Many librarians are responding to the open access movement by

establishing technical infrastructures and tools for their management and dissemination such as library websites, institutional repository, OPAC, and others. Some have moved to the forefront of open access movement with various initiatives that are meant to create awareness and encourage users to key in to open access movement. Zhang (2014) reported that the Chinese library community has been standing at the forefront of promoting open access. The author enumerated some open access activities of the National Science Library (NSL) as setting up an Open Access Promotion Portal to distribute news, reports and research on OA, organising annual OA Week for promotion of open access in China and establishing an Information Policy Centre to support research and the promotion of open access. American Library Association (ALA) (2007) enumerated various ways librarians can support the open-access movement to include:

- Plan workshops for faculty about why open access is important to them and what they should know when publishing.
- Advocate for the inclusion of open-access journals in the pool of publications used when evaluating for tenure.
- Educate public library users on how open-access issues impact their ability to access pertinent information, particularly medical and other scientific information.
- Encourage the use of open-access repositories and journals by including them in our electronic resources, LibGuides and other local information sources.
- Promote the copyright rights of authors by educating faculty on negotiating with publishers regarding the deposit of published articles in digital repositories for access and preservation.

Libraries have also been designated as OA publishers. Engeszer and Sarli (2014) reported that the growing acceptance of OA publishing has afforded libraries with opportunities to assume the role of publisher. They are using the greater availability and affordability of digital publishing platforms to explore new methods of communicating and disseminating the research results of campus authors.

Some previous researchers have studied implementation and management of open access by librarians. Sanjeeva and Powdwal (2017) studied Open Access implementation in institutes' libraries in Mumbai. The study found that majority of the librarians were involved in open access advocacy to their researchers. The most used method was sending emails and posters to promote Open Access. In addition, University libraries and larger institutes arranged talks by experts to promote Open Access. Bullock, Hosburgh and Mann (2015) study revealed that the systems and procedures librarians deployed to manage OA resources include content link resolvers, Online Public Access Catalogs (OPACs), database and journal lists, discovery services and research guides. Respondents reported that the biggest challenges of OA management are the huge number of available resources, inconsistent metadata and lack of OA collection development criteria. Lwoga, and Questier (2015) in a study of Open access behaviours and perceptions of health sciences faculty and roles of information professionals in Tanzania revealed that there was a strong support for promoting OA issues on campus; however, this positive support with various open access related tasks did not translate into actual implementation of OA activities. Findings indicated that few librarians were engaged with OA activities, such as monitoring Internet sites and reading literature that discuss OA issues.

Literature and empirical studies have depicted the state of involvement of some librarians in open access management. The present research was designed to determine the engagement by medical librarians in Nigeria.

Methodology

This is a survey research. The population of study is medical librarians in Nigeria. The Medical Library Association membership had a list of 112 names. Questionnaire was the instrument used for data collection. The questionnaire was created and distributed online through SurveyMonkey survey tool (<http://www.surveymonkey.com/>). The questionnaire link with cover letter was distributed through the email list and WhatsApp platform of the Association in July 2019. Fifty – one medical librarians from thirty - six medical institutions responded to the survey.

Respondents' demography is shown in table 1. Results were analyzed using simple percentages and mean scores. The results are presented in figures and tables.

Findings

Background of Respondents

As revealed in Table 1, majority of the respondents were female (52.9%) and most of the respondents had Master's degree and above (64.7%). Most of the respondents were working in academic medical library (72.1%)

Table 1: Respondents' Demography N=51

	F	%
Gender		
Male	23	45.1
Female	27	52.9
Missing	1	2.00
Qualification		
PhD	10	19.6
Master	23	45.1
BLS	15	29.4
Others	2	3.9
Institution		
Academic medical library	37	72.5
Hospital library	8	15.7
Medical Research Institute Library	3	5.9
Missing	3	5.9
Years of services		
1 - 5 <	7	13.7
6 – 10	15	29.4
11 – 15	13	25.4
16 – 20	4	7.8
> 21	11	21.6

Awareness and Understanding of Open Access Models and Licensing Practices

Awareness and understanding of open access models and licensing practices by medical librarians is shown in figure 1 and table 2.

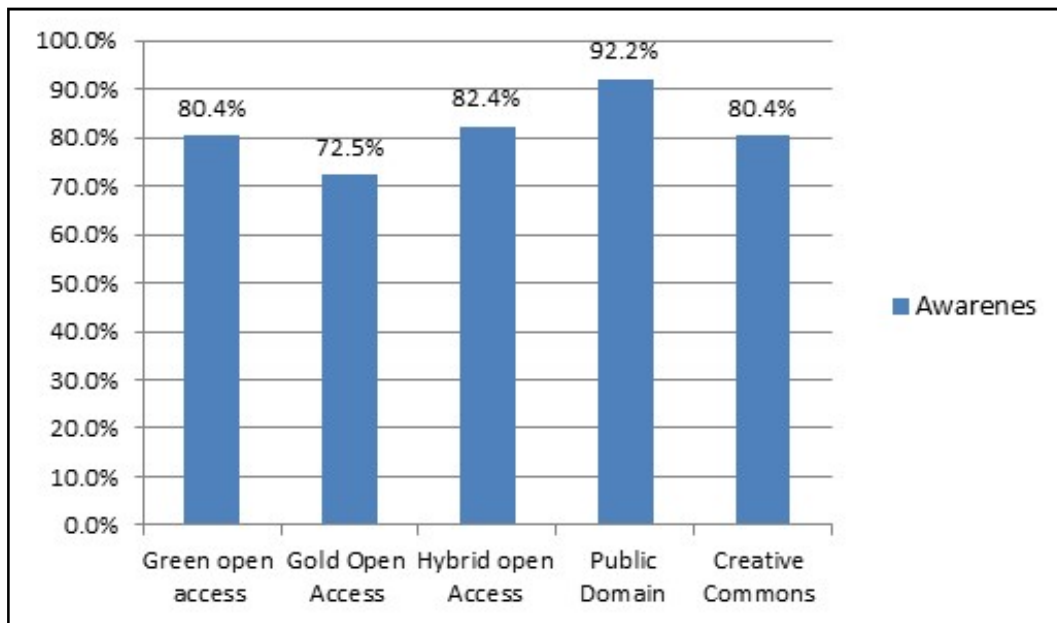


Figure 1: Awareness and knowledge of open access models and licensing practices-

Results from figure 1 show a high awareness of open access models. Most of the respondents affirmed having heard of the open access models and licensing practices. Large majority 42 (82.4%) have heard of Hybrid open access and Green open access. 41 (80.4%). However, the figure is lower for respondents that are aware of gold open access

37 (72.5%). For licensing, almost all 47 (92.2%) are aware of public domain while 41 (80.4%) indicated awareness of Creative Commons.

Respondents were requested to indicate their level of knowledge of open access models. The result is presented in table 2.

Table 2: Respondents Knowledge of implementations of open access models and licensing

	Extensive Knowledge	Basic Knowledge	Aware but no Knowledge	Not aware of the topic	Weighted Average
Green Open Access	10 (19.61%)	12 (23.53%)	19 (37.25%)	10 (19.61%)	2.43
Gold Open Access	9 (17.65%)	10 (19.61%)	18 (35.29%)	14 (27.45%)	2.27
Hybrid Open Access	12 (23.53%)	13 (25.49%)	17 (33.33%)	9 (17.65%)	2.55
Public Domain	16 (31.37%)	19 (37.25%)	12 (23.53%)	4 (7.84%)	2.92
Creative Commons	14 (27.45%)	14 (27.45%)	13 (25.49%)	10 (19.61%)	2.63

Table 2 presents the level of Knowledge of open access models by the medical librarians. Despite high majority having encountered the concepts as shown in Figure 1, Table 2 revealed the percentages that have full Knowledge of the open access

publishing models were low. Less than half of the respondents acknowledged they have a basic or extensive Knowledge of the implementation of hybrid open access (49.02%), Green open access (43%) and Gold Open Access (37.25%).

However, Knowledge was higher for open access licensing types, public domain (68.62%) and creative commons (54.9%).

Awareness and Use of Open Access Resources in Medical Libraries

Tables 3 and 4 present awareness and use of open access resources for information services by the medical librarians.

Table 3: Awareness of Open Access Resources

Open Access Resource	Aware (%)	Not aware (%)
Directory of Open Access Journal	98	2
Directory of Open Access Books	92	8
Open Access Theses and Dissertations	90	10
Directory of Open Access Repositories	88	12
PUBMED Central	88	12
HINARI	98	2

A list of open access and freely accessible resources and databases was provided and respondents were requested to indicate their awareness of the availability of the resources for information services. Table 3 shows a high awareness of open access resources. Almost all respondents 49 (98%) claim awareness of the existence of Directory of Open Access Journals and HINARI. Most 46 (92%) also affirmed knowledge of the existence of Directory of Open Access Books (DOAB), and Open Access

Theses and Dissertation (45, 90%). Equal high percentage 44(88%) claimed awareness of Directory of Open Access Repositories (OpenDOAR) and PubMed Central a repository of open and freely accessible publications in health and biomedical sciences

Respondents who indicated awareness of open access resources were requested to indicate their level of use of these resources for services in the library. The result is presented in table 4.

Table 4: Level of use of open access resources for services in the library n=50

	Use Very/ often	Use occasionally	Aware but do not use	Not aware at all
Directory of Open Access Journals (DOAJ)	24 (48.00%)	14 (28.00%)	11 (22.00%)	1 (2.00%)
Directory of Open Access Books (DOAB)	14 (28.00%)	17 (34.00%)	15 (30.00%)	4 (8.00%)
Open Access Theses and Dissertations (OATD)	17 (34.00%)	16 (32.00%)	12 (24.00%)	5 (10.00%)
Directory of Open Access Repositories (OpenDOAR)	14 (28.00%)	15 (30.00%)	15 (30.00%)	6 (12.00%)
PubMed Central	22 (44.00%)	7 (14.00%)	15 (30.00%)	6 (12.00%)
HINARI	32 (64.00%)	10 (20.00%)	7 (14.00%)	1 (2.00%)

Results from table 4 reveal that the open access / free resources most frequently used (Very often and often) by the respondents for information service to users was HINARI as 32 (64.00%) used it frequently. The table shows that less than half indicated frequent use of other resources: Directory of Open Access Journals (48%), PubMed Central

(44%) and Open Access Theses and Dissertations (34.00%). Less number 14 (28%) affirmed frequent use of Directory of Open Access Books of Directory of Open Access Repositories.

Open Access Practices in Medical Libraries in Nigeria

Table 5: Open access practices in Medical libraries in Nigeria

S/N	Open access practices	Frequency	%
1.	Have links to open access databases and resources on library website	25	50
2.	Direct patrons to open access publications	25	50
3.	Collect and deposit open access books and journals as part of e-resources	22	44
4.	Educate patrons about OA, copyright issues and predatory journals	18	36
5.	Establish institutional repositories	14	28
6.	Establish Open Educational Resources (OER)	11	22
7.	include bibliographic records for OA books and journals in the library catalogues	10	20
8.	Provide hosting services for open access journals.	6	12
9.	Hold open Access week events to promote awareness	4	8
10.	We do not offer open access services	15	30

Table 5 reveals types of open access management and services offered by the respondents in their libraries. Half of the respondents indicated they created links to open access databases on library websites and direct patrons to open access publications. Other services reported by the respondents were collecting and depositing open access books and journals as part of e-resources (44%). Patrons were educated about OA, copyright issues and predatory journals by (36%) of the respondents. Some of the respondents (28%) indicated their libraries established institutional repositories and established Open Educational Resources (OER) (22%). Ten respondents (20%) noted that they included bibliographic records for OA books and journals in the library catalogues while only (12%) provided hosting services for open access journals.

Avenues for Acquisition of Knowledge and Skills on Open Access Management

Training avenues and respondents need for further training show that 63.3% of the respondents attended

workshops and conferences to acquire knowledge of open access management and practices. In-house presentations constituted (38.8 %) and online webinar was (26.5%), and (22.5%) revealed they had never attended any training on open access management. Majority (80%) of the health librarians indicated that they need further training on open access management in libraries

Discussion

The research sought to find out the level of awareness and knowledge of implementations of open access publishing models and licensing by medical librarians in Nigeria. The findings established that there was a high awareness of open access models and licensing types among the 51 respondents. Most of the respondents affirmed having heard of hybrid OA (82%), Green OA (80.4%), and Gold OA (72.5%). Respondents were also highly aware of creative commons licences (80.4%) and public domain policies (92.2%) that propel open access publications. However, despite the high level of awareness of the topics, the

percentages that possess full knowledge of the models were low. Less than half of the respondents acknowledged that they had full knowledge of the implementations of gold, green and hybrid open access models. Understanding was higher for creative commons and public domain practices.

This low level of understanding of open access models by the librarians implies that these librarians may not be very conversant with the intricacies of open access management. Consequently, its exploration may be limited in the libraries leading to them missing the opportunities to provide vital resources needs by library users. Such knowledge is also prerequisite for managing resources such as institutional repositories. It is pertinent to note that though majority of the study respondents are from academic health sciences libraries, it is only 19.6% of the respondents that indicated they had an extensive knowledge of Green open access. This is an important avenue for uploading content into institutional repositories through self-archiving by users. Poor understanding of the implementation of Green Open Access model indicate that these librarians may not be advocating and inculcating skills to get their primary users involved in contributing to open access self-archiving practices. Librarians' minimal knowledge of creative common licences may not be able to differentiate between open access publications and online pirated copies of publications especially e-books. They may be at risk of being unable to different between copyright protected work, open access, and pirated works thereby capable of violating the copyright law. Fisk (2009) noted that librarians not knowing about or understanding digital piracy put themselves and institutions at risk for criminal and civil prosecution. Also, without this knowledge, they may not properly guide and teach their users to adhere to copyright provisions.

Awareness and Use of Open Access Resources

Results indicate a high awareness of open access and freely accessible resources by the medical librarians. High percentages (e—88%) were aware of the availability of Directory of Open Access Journal and HINARI, Directory of Open Access Books (DOAB) Open Access Theses and

Dissertations, Directory of Open Access Repositories, and PubMed Central. Findings show that the only resource used frequently by the respondents for information service is HINARI (64.00%). There was minimal use of other freely accessible and open access repositories. The topmost use of HINARI compared to other resources is not unexpected considering that there is great publicity and continuous professional and user training on the use of the resource by Research4life organisation. HINARI provide online access to subject related peer-reviewed biomedical journals, books, and databases from the world's leading academic publishers to non-profit academic and research institutions, governmental and policy making departments in low income countries free or at low cost subscription based on a country's Gross National Product (GNP). Its content includes freely accessible articles from subscription-based journals and peer reviewed open access publications.

Result revealed that less than half of the medical librarians frequently use *PubMed Central*. This database provides access to free full texts of peer reviewed articles and research reports in the biomedical sciences. It is therefore an important resource that can add value to the collections of medical libraries in Nigeria. The low level of use of open and freely accessible resources indicate that these librarians despite their high awareness of the resources may not be creating awareness of their existence and teaching skills for effective access of their contents. Consequently, many of their patrons may not be aware of their importance for free access to quality information and research findings.

The findings of the study are similar to other findings among librarians that showed good level of awareness of OA publications; concepts and support but possess little Knowledge about OA initiatives, and poor translation into actual implementation of OA activities (Bullock, Hosburgh and Mann, 2015; Lwoga, and Quetier, 2015; Musa, 2016). These contradictory findings have been observed and reported by Tenopir, Dalton, Christian, Jones, et.al. (2017) that within the last several years, many studies have shown that academics' awareness of open access journals has steadily increased. However, awareness does not always equate to understanding or acceptance of OA and its different models

Open Access Practices in the Medical Libraries

The study shows low indices in open access practices by the medical librarians. The study revealed that only half (50%) of the librarians offer OA services by creating links to open access databases on library websites and directing patrons to open access publications. Less than half of the respondents engaged in other practices such as collecting and depositing open access books and journals as part of e-resources (44%), educating patrons about OA, copyright issues and predatory journals (36%). Lower percentages of respondents (28%) indicated their libraries established institutional repositories and establish Open Educational Resources (OER) (22%). Twenty percent include bibliographic records for OA books and journals in the library catalogues while only (12%) provide hosting services for open access journals. The practices though not highly encompassing, the responses attest to the librarians' involvement in some forms of open access management in their libraries. However, there is need for improvement to full engagements.

Sources of Knowledge on Open Access Management

Training and retraining are important for professional development for knowledge and skills acquisition for proper management of open access resources in libraries. The medical librarians revealed the major avenue they acquired knowledge of open access management and practices was in conferences and workshops (63.3%). Other skills acquisition avenues indicated by 38.8% of the respondents were in-house staff workshops or presentations, and online webinar (26.5%). 22.5% revealed that they had not attended any training on open access management. Importantly, majority (80%) of the health librarians indicated that they needed further training on open access management in libraries.

Conclusion

Open access resources can contribute in enriching a library's collections by adding to the diversity of collections in the library. Medical Librarians in the study indicated good awareness of open access

models, licensing and resources. However, they have low full knowledge of these concepts. The study also showed low open access management practices in the medical libraries. The result is significant because it reiterated what was reported in the literature on high awareness of librarians on open access publications and concepts but poor translation into actual implementation of OA activities. Since open access publications and repositories have assumed important route for disseminating scientific and biomedical information, it is imperative that the medical librarians institute inclusive collection management of open access resources with subscription based resources. They also need to improve their knowledge and skills of OA management. This is necessary for building the diverse collections relevant to the information needs of library patrons in the digital age.

Recommendations

Based on the findings of the study the following are recommended:

1. The results of the study show that there is need for the medical librarians in the study to explore all avenues to acquire open access management knowledge. Outside the formal education setting, conferences, workshops and recently online webinars provide platforms for creating awareness of emerging professional phenomenon and inculcating of skills including on collection management of library resources.
2. Open and free access repositories such as PubMed Central and HINARI are specifically designed to provide relevant and current medical information. Considering their importance and usefulness, the medical librarians when providing literature access services to patrons should use them often. In addition, the librarians should continuously create awareness of their availability and importance in providing quality medical information.
3. Medical librarians in Nigeria should improve on open access practices. They should create awareness of quality open access publications through links on library websites, offer training on OA resources and how to effectively search

them as part of information literacy modules as well as inculcate skills for identification of predatory open access publications.

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