Barriers to Optimal Utilization of Health Information Resources by Doctors in Nigeria

Obianuju E. Nwafor-Orizu   Oliver T.U. Onwudinjo

Prof. Festus Nwako Library, Nnamdi Azikiwe University, Nigeria

Abstract
This paper aims to report on research investigating the difficulties doctors encounter in accessing health information and strategies for countering the problems for optimal utilization of information resources. Data were gathered using structured questionnaire administered to all the 1,995 Doctors in the six teaching hospitals in South East Nigeria. The findings indicate that high cost of acquiring materials and non-conducive library environment are considered the biggest problems. Earlier studies did not investigate doctors in this zone, nor did they cover all ranks of Doctors in teaching hospital setting. This paper can be a platform for informed intervention for better healthcare delivery in the zone. It is an original research paper
Keywords: health information, information utilization, health information resources, information, medical doctors

1. Introduction
The importance of health information to medical doctors cannot be over emphasized. Doctors need health information for clinical work, academic work, research work, decision making, information dissemination, detection and administrative purposes among others. Most significant among these information needs is that associated with clinical work. Clinical medicine has to do with direct patient treatment and care. It involves diagnosis, treatment, delivery of care and other formal and informal tasks such as counseling or rendering professional advice to patients (Musoke: 2000). Despite the established importance of health information in medical practice, it had been observed that medical doctors in the teaching hospitals in the region under study do not seem to make frequent or optimal use of health information resources for current knowledge as expected. Why? This seems to result in obvious preventable medical errors (a mistake of commission) and malpractices that harm the patients as often witnessed in the teaching hospitals. Examples abound in these teaching hospitals of doctors'- poor attitude to patient care; ineffective diagnosis and treatment; unethical procedures; use of outdated drugs and procedures; inefficient handling of cases; nonchalant attitude to patients' pains and sufferings; exploitation of patients; abandonment of duty posts and general abuse of the Hippocratic oath. Yet better healthcare delivery in the region can only be achieved through proven and clinically effective practices, arising from unhindered use of health information resources by the doctors. Apart from this, the literature is silent on the barriers faced by doctors in South East Nigeria in accessing health information. It therefore became very needful to spot these barriers and proffer solutions because ideally doctors should have express access to health information at the point of need. These are what this paper explored.

Objective of the Study
1. To find out the problems associated with accessing and utilization of health information resources by doctors in teaching hospitals in South East Nigeria.
2. To suggest strategies for the enhancement of utilization of health information resources by doctors in teaching hospitals in South East Nigeria.

Hypothesis
There is no significant difference in the mean rating of different categories of Doctors with regards to problems associated with accessing and utilization of health information resources by doctors in teaching hospitals in South East Nigeria.

2. Review of Related Literature
The literature is replete with description of various barriers impeding the optimal utilization of health information resources by doctors.

Respondents in the majority of the literature complained of time constraint. It takes time to search for and retrieve articles; it takes time to sift through the retrieved literature and it takes time to read and digest the selected articles for practical application (NUGH, 1989). Just like other busy professionals, doctors run tight schedules. Therefore, Bryant (2000) argues that their obvious reluctance to commit time needed to conduct literature searches or read and reflect upon the findings of previous studies is understandable.

In their study of the use of evidence-based medicine in practice, consultant physicians, Scott, Heyworth and Fair-weather found respondents laying 74% of their blame for underutilization of information resources on

lack of time. Consistent with this result are the reports by Green, Ciampi and Ellis (2000),, and Andrews et al (2005) with 60% and 76% portion of total hindrances respectively heaped on lack of time. According to Bryant (2004) the attitude of half of his interviewees toward looking for information was epitomized as time-consuming and frustrating.

Other empirical studies whose findings accord with these results are those of Murray, Carey and Walker (1999) on the information needs and information seeking behaviour of medical research staff; Pyne et al (1999) on meeting the information needs of clinicians for the practice of evidence – based healthcare; Coumou and Meijman (2006) on how primary care physicians seek answers to clinical questions: a literature review; Grefsheirm, Jocelyn and Rankin (2007) on information needs and information seeking in a biomedical research setting: a study of scientists and science administrators; and Chiwetalu and Ratner (2007) on an assessment of the information seeking abilities and needs of practicing speech-language pathologists.

Due to this time factor many studies suggest that doctors rather make use of what is readily available and convenient that requires minimal time to access Stinson, (1980); Lundeen, Tenopir and Wermager, (1994); Dawes & Sampson (2003); Burke et al. (2004); Tenopir, King and Bush, (2004); Andrews(2005).

Another strong obstacle to health information resources utilization as reported by many studies is lack of information searching skills. In their study of Physicians' internet information seeking behaviours, Bennett, Casebeer, Kristofco and Strasser (2004) found out that poor searching or navigating difficulties hinders the retrieval of the required evidence.

Also Renwick (2005), from his study of- knowledge and use of electronic information resources by medical sciences faculty of the university of West Indies explained that the ability to use electronic resources efficiently depends on basic computer skills, knowledge of what is available and how to use it, and ability to define a research problem. Verhoeven, Boerma and Meyboom-de Jong (1995), in their study of use of information sources by family physicians: a literature review, found out that converting clinical questions to a searchable strategy for an information resource is a crucial skill, difficult to master. According to them, inexperienced searchers have been found to use inappropriate search terms, wrong or inappropriate data bases, incorrectly spelt terms, inappropriate connectors and brand drug names rather than generics.

Even in their study of resident doctors Bergus and Emerson (2005) found out that even question formation skill did not improve as doctors progressed in their clinical training. This lack of skill, according to Sanders and Delmer (2005) is compounded when the doctors believe search failed because of lack of relevant evidence, rather than realizing the problem was the errors in their search strategy. Unsuccessful attempts at retrieving information from a search discourage doctors from such attempts in future.

Many doctors see lack of information technology training as their common barrier to information utilization. This is the result of a study entitled- "use of libraries and electronic resources by primary care staff: outcomes from a survey", carried out by Daney, Barlow and West (2005). Yet another study of end users found that whilst training was important, practice was the biggest reason behind improvement in the quality of searching (Mckibbon, and Walker-Dilks, 1995). This is because literature searching skills decline if not used regularly (Davidoff & Florence, 2000).

Another interesting dimension that compounds this issue of IT training further is spotted by D' Alessandro, Krieter and Peterson (1998) in their project entitled Barriers to rural physicians use of digital health science library and Erickson and Warner (1998) the impact of an individual tutorial session on medical use among obstetrics and gynecology residents in an academic training programme: a randomized trial. Both studies reported reluctance or lukewarm attitude of doctors at under-going the training even when given free opportunities. This implied lack of interest or urgency was later identified as a serious barrier to information utilization in the studies by Green, Ciampi and Ellis (2000) entitled – Residents medical information needs in clinics: are they being met?, and that of Ely, et al (2005), entitled answering physicians clinical questions: obstacles and potential solutions. This is also closely related to another finding by Ely and his team (2005) which stated that respondents were reluctant to search for information because they felt that the answers did not exist or would not affect care.

Information overload is another barrier severally featured in the literature. The concept of information overload occurs when the volume of information received becomes a hindrance rather than a help (Bawden, Holtham and Courtney, 1999). Wilson (2001) on his part defines information overload at the individuals level as 'a perception on the part of the individual that the flow of information associated with work task is greater than can be managed effectively, and a perception that overload in this sense creates a degree of stress for which his or her coping strategies are ineffective.

In their survey among Norwegian physicians entitled –keeping professionally updated: perceived coping and CME profiles among physicians, Nylenna, Falkum and Aasland (1996)) found that one-third of the respondents reported they were unable to stay updated in their daily work. In another study captioned family physicians information seeking behaviours: a survey comparison with other specialties, conducted by Benneth et al (2005), family doctors ranked information overload as the second most disturbing barrier in their utilization of

information resources. Some other barriers identified by the respondents include: specific information not available, system being too slow, software incompatibilities and difficulty down-loading information.

Communication is generally known to be expensive. Provision and utilization of internet facilities is costly, from acquisition of the systems to the last point of downloading and printing. This barrier was reported by Andrews et al (2005) in their study of the Information – Seeking Behaviour of Practitioners in a Primary Care Practice - Based Research Network (PBRN). Also doctors failure to recognize or record important questions about patient care that arise in consultations and lack of confidence to search and appraise relevant research at the point of clinical decision making also constitute barriers as were identified by McColl, Smith, White and Field (1998).

From his research titled International Cooperation in Africa – problems and achievement

Akhigbe (1998) specifically identified the barriers that hinder effective utilization of health

information resources in Africa. His result includes: the prohibitive cost of communication, lack of information resources in Africa. His result includes: the prohibitive cost of communication, lack of basic infrastructure and reduction in subscription to health sciences journals. Also from his findings from a research titled – Global information flow Ochieng (2000), identified inappropriate contents, language barriers, high illiteracy rate and inappropriate infrastructure as factors militating against information utilization in Africa. Some other barriers articulated by Chiwetalu and Ratner (2007)in their assessment of the information – seeking abilities and needs of practicing speech – language pathologists, include inability to get full access to desired information, like full text instead of abstract, lack of clinically relevant information and interpreting retrieved information. This inability to interpret the evidence found was earlier reported by Coumou and Meijman (2006).

With the array of barriers found out in this section, this study was better placed to find out the particular barriers applicable to doctors in teaching hospital in South East zone of Nigeria, as the literature did not identify them.

3. Research Methods

The study adopted a descriptive survey design. The Area of the study was the South East geographical zone of Nigeria, comprising five states namely: Abia, Anambra, Ebonyi, Enugu and Imo. All the 1,995 medical doctors of the ranks of Consultants, Senior Registrars, Registrars, Senior House Officers and house officers in the six teaching hospitals were involved as subjects of the study. The subjects were 156 doctors from Abia State University Teaching Hospital, 198 from Ebonyi State University Teaching Hospital, 228 from Enugu State University Teaching Hospital, 160 from Imo State University teaching Hospital, 503 from Nnamdi Azikiwe University Teaching Hospital and 702 from University of Nigeria teaching Hospital. A researcher-developed instrument titled "Health Information Resources and Utilization Questionnaire" (HIRUQ) was used for data collection. The copies of the questionnaire were personally administered to the respondents through the researchers and research assistants. In all, a total of 1,417 copies of the questionnaire were properly filled and returned.

Ethical approval and certificates were obtained in the six participating teaching hospitals from their respective Ethical Committees following laid down procedure. The researchers used both the descriptive and inferential statistical methods to analyze the data. Specifically, for the research questions, interpretation of the mean scores was based on the benchmark of 3.00 for acceptance or rejection of respondents' opinion. That is, a mean of 3.00 and above implies the acceptance, while a mean less than 2.50 is an indication of rejection. For the hypotheses, Analysis of Variance (ANOVA) at probability of 0.05 was used. The computer software, Statistical Package for Social Sciences (SPSS 12.0) was used to analyze the data.

4. Presentation of Results
Table 1: Mean and Standard Deviation of the Responses of Medical Doctors on the Perceived Barriers Associated with Accessing and Utilization of Health Information Resources

Item	Mean	Std. Deviation	Decision
Non availability of current sources of information	3.86	0.93	Accepted
High cost of acquiring the materials	4.35	0.76	Accepted
Inadequate time to read or browse	2.77	1.37	Accepted
Incompetent internet skills	1.77	1.35	Rejected
Internet information overload	1.86	0.84	Rejected
Poor internet connectivity	2.78	1.51	Accepted
Poor attitude to acquiring information technology skills	1.75	0.96	Rejected
Proximity to the library	3.46	1.51	Accepted
Inadequate library opening hours	3.86	0.93	Accepted
Library environment not conducive	4.35	0.76	Accepted
Overall	2.77	1.37	

The result presented in Table 1 indicates that seven (7) of the ten (10) items in the table on the perceived barriers were rated positive and accepted as problem areas militating against accessing and utilization of health information by medical doctors in teaching hospital in South East Nigeria. This is based on the attainment of mean scores 3.86, 4.35, 2.77, 2.78, 3.46, 3.46, 3.86, 4.35 and 2.77 respectively for the items on the table, which are above the criterion mean of 2.50. On the other hand incompetent internet skills, internet information overload, and poor attitude to acquiring information are perceived as no impediments by most respondents. Their mean scores of 1.77, 1.86 and 1.75 fall below the cut-off point of 2.50 and are therefore rejected as problems.

However, high cost of acquiring materials and non-conducive library environment with mean scores of 4.35 each are considered as posing the biggest problem, while poor attitude to acquiring information technology skills is rated as posing the least problem with a mean score of 1.75.

Table 2: Mean and Standard Deviation of the Responses of Medical Doctors on the Strategies for the Utilization of Health Information Resources

Items	Mean	Std. Deviation	Decision
Regular acquisition of current materials by the library	4.17	0.64	Accepted
Regular IT skills training and retraining of Doctors	3.87	0.92	Accepted
Extension of library opening hours	3.80	0.94	Accepted
Up-to-date online library services	4.16	0.65	Accepted
Internet connectivity in clinics and officers	4.78	0.57	Accepted
Strategies	4.15	0.59	Accepted

The result presented in Table 2 shows that all the items on the strategies for enhancement of accessing and utilization of health information resources by doctors are rated positive and accepted as the ratings are above the criterion mean of 2.50. The strategies are: regular acquisition of current materials by the library, regular IT skills training and retraining of doctors, extension of library opening hours, up-to-date online library services and internet connectivity in clinics and offices.

Hypothesis
Table 3: Summary ANOVA Table for Mean Rating of Medical Doctors on Perceived Barriers Utilized of Health Information Resources

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	139.261	8	17.408	325.449	.000
Within Groups	75.311	1408	.053		
Total	214.572	1416			

The result in Table 3 shows the summary ANOVA table for mean rating of medical doctors on perceived barriers utilized of health information resources. The F-value (325.449) is significant at p = 0.000; this F-value is equally significant at 0.05; this is because p is less than 0.05. That is (p<0.05; p = 0.000). Therefore the hypothesis of no significant difference in the mean rating of different categories of doctors with regards to

the problems associated with accessing and utilization of health information resources by doctors in teaching hospitals is not accepted. Hence, there is significant difference in the mean rating of different categories of doctors with regards to the problems associated with accessing and utilization of health information resources by doctors in teaching hospitals.

5. Discussion
5.1 Problems Associated With Accessing and Utilization of Health Information Resource
From Table 1, it is observed that the respondents identified with only seven of the listed items as perceived problems impeding their utilization of health information resources. These problems are non-availability of current sources of information, high cost of acquiring materials, inadequate time to read or browse, poor internet connectivity, proximity to the library, inadequate library opening hours and non-conducive library environment. This array of diverse barriers may present doctors in teaching hospitals in South East Nigeria with impediments to their optimal utilization of health information resources for effective healthcare delivery.

Akhigbe (1998) specifically identified the barriers that hinder effective utilization of health information resources in Africa. His findings included the prohibitive cost of communication, lack of basic infrastructure and reduction in subscription to health sciences journals. Lack of basic infrastructure and drop in subscription to medical journals all revolve around cost. Also the provision and utilization of internet facilities is costly, from acquisition of the systems to the last point of downloading and printing. This barrier was reported by Andrew et al. (2005) in their study of the information-seeking behaviour of practioners. The problem of non-availability of current sources of information is easily traceable to the high cost of acquiring materials. These imply lack of funds for adequate provision of materials and infrastructure that will boost access and utilization of health information resources.

Inadequate time to read or browse was accepted by respondents in this study as a barrier. All steps involved in searching, retrieving, reading and digesting selected information for practical application are time consuming.

This time factor had earlier been identified by some other investigators as largely hindering doctors from maximally utilizing available information resources. Reports by Green, Ciampi and Ellis (2000), and Andrews et al. (2005) heaped 60% and 76% portions of total hindances respectively on lack of time. For Bryant (2004), the attitude of half of his interviewees toward looking for information was epitomized as time-consuming and frustrating.

Some other studies whose findings accord with these are Murray, Carey and Walker (1999), Pyne et al (1999), Coumou and Meijman (2006), Grefsheirm, Jocelyn and Rankin (2007) and Chiwetalu and Ratner (2007).

Another barrier generally accepted by doctors in this study as hindering their utilization of health information resources is poor internet connectivity. Smith et al (2007) discussed poor internet connectivity as a major constraint to doctors use of online resources in four teaching hospital in Africa.

Together the problems of proximity to the library, inadequate library opening hours and non-conducive library environment were rated high in Table 1 as hindering doctors smooth use of the library. Many as they are, they must have conspired to scare away the doctors from utilizing the medical library resources as consistently indicated by the study, which identified them as prominent problem areas negating affective dissemination of health information. This therefore justifies doctors' choice of the internet as the first preferred among other media. This would have been otherwise if the above internet problems were actually weighting them down.

To gain further insight into the responses, the hypothesis was tested. Table 3 showed the statistical comparison of mean scores on all categories of doctors on the barriers associated with their use of health information resources. Significant difference was found between their ratings. What this implies is that category is a factor when it comes to problems faced by medical doctors in accessing health information resources. Doctors of all ranks experience varied levels of similar difficulties in utilizing health information resources.

5.2 Strategies for the Enhancement of Utilization of Health Information Resources.
From Table 2 it is observed that all the five identified strategies were rated positive and accepted with mean scores of between 3.80 and 4.78 on a five point linket scale. The preferred strategies are regular acquisition of current materials by the library, regular IT skills training and retraining of doctors, extension of library opening hours, up-to-date online library services and internet connectivity in clinics and offices.

Paramount among these strategies is the provision and sustenance of internet connectivity in clinics and offices. For now, from findings in Table 3 this provision is very low or nonexistent in teaching hospitals in South East Nigerian. Smith et al (2007) suggested that relatively small investments in connectivity which are carefully managed by teaching hospitals will increase access to large amounts of information. This will also enable other solutions like up-to-date online library services and regular IT skills training and retaining of doctors.

6. Conclusion and Recommendations

The major barriers that impede doctors' access and utilization of the resources for their various purposes revolve mainly around high cost of materials. This implies that health information resources are not optimally utilized by the respondents and may not be optimally used unless some of these barriers are lifted. The strategies proffered by the study should be carefully implemented by the teaching hospital management for the expected outcome. Furthermore:

1. Medical libraries should be better funded to improve quantity, and currency of the collection to meet international standards and trends which are evidence based.
2. Librarians should initiate and sustain ICT programmes appropriate to improve doctors search skills.

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