



## Review article

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### Health information technology skill gaps and training needs of Health Information Management professionals in Nigeria: A review

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#### ABSTRACT

**Background/Objectives:** The healthcare industry is increasingly influenced by the use of information technology in various forms. There is however a lack of effective health information management (HIM) systems due to the prevalence of cumbersome paper-based and disjointed health data management systems and most importantly, due to inadequate Health IT knowledge and skills among HIM professionals in Nigeria. **Design/Methods:** This scoping review sought to determine knowledge and skill gaps in information technology vis-à-vis IT training needs among HIM professionals. **Results:** Noteworthy to say is that these professionals are passionately seeking for advanced Health IT training. **Conclusion:** There is need for general and specific training in information technology for practicing HIM professionals and there is a need to review the curricular in order to accommodate general and specific training needs of future HIM professionals. These includes IT awareness and appreciation, data analytic and software exposition among others. In addition, the compulsory continuing professional development education anchored jointly by the professional body (AHRIMPN) and the regulatory agency of federal government (HRORBN) should be sustained.

**Keywords:** Electronic health records; Health information technology; Health information management; Information technology; Training and development

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#### INTRODUCTION

The healthcare industry is increasingly influenced by the use of information technology in various forms ranging from patients' health records management to patient monitoring, communication and treatments<sup>1</sup>. Information technology (IT) enables healthcare professionals to confidently access, interpret and apply organizational knowledge, patient care procedures, best practices and other skills in a manner that improves patient satisfaction, achieves better clinical outcomes and maximizes cost savings for the organization<sup>1</sup>. It is noteworthy to say that

mankind has witnessed an unprecedented growth in the number and variety of information products, services, systems and sources available. There have been rapid innovations in electronic technologies for creating, processing, communicating and using information<sup>2</sup>. Information technology is becoming an integral part of the work of professionals, making the examination of factors critical to technology acceptance by them essential for its success. This is especially the case in healthcare services, where improvement depends on the quality of documentation, security of information and

prompt retrieval of health information<sup>3</sup>. These goals can largely be accomplished through the deployment of IT, which facilitates the use of electronic health records (EHR) and supports healthcare decision making processes<sup>3</sup>. Undeniably, the continuing revolution in IT has moved beyond the realm of supporting managers and business users to that of enhancing and transforming the work of skilled professionals and healthcare providers<sup>4</sup>.

### **Health information management (HIM) and HIM professionals**

Health information management (HIM) is the discipline that has historically focused on the management of health records. It (HIM) is the practice of acquiring, analyzing, and protecting digital and traditional medical information vital to providing quality patient care. The HIM professionals are highly trained in the latest information management technology applications and they understand the workflow in any healthcare provider organization, from large hospital systems to the private physician practice<sup>5</sup>. They are vital to the daily operations management of health information and electronic health records.

The professionals often serve in bridging roles, connecting clinical, operational and administrative functions. They affect the quality of patient information and patient care at every touch point in the healthcare delivery cycle. Their presence ensures the right information on hand, when and where it is needed, while maintaining the highest standards of data integrity, confidentiality and security<sup>5</sup>. They are responsible for the quality, integrity and protection of patient's health records and hospital-held information. As technology advances, the role of the HIM professional expands. These professionals adapt to new methods of capturing healthcare information, storing that information and easily accessing it electronically. Their role is important in order to maintain organized and accurate electronic data that allows daily healthcare routines to carry on smoothly with the new technological advancements.

### **HIM practice and the need for Health IT in Nigeria**

The purpose of HIT is to provide better care for patients and help achieve health equity.

This technology (HIT) supports recording of patient data to improve healthcare delivery and allow for analysis of this information for both healthcare practitioners, health authorities and agencies. Having a comprehensive patient history empowers providers to more accurately treat ailments and prevent over-prescribing medications, which can be fatal. Without health records, physicians would need to depend on the patient's memory, which can lead to inaccurate medical history due to forgetfulness, complex drug names, and ailments affecting the patient's recollection<sup>6</sup>.

Human resource management is the strategic approach to effective management of people in an organization such that they help their business gain a competitive advantage<sup>7</sup>. Human capacity building required in the health sector is more than just technical basic skills. It includes strategic thinking about the meaning and use of information for action. This demands a mix of skills to understand the meaning of data, information and IT. The skills of using IT are needed for a large number of people, whereas, skills in IT management and systems development are needed by a few people at each level, who understand most of everything about IT<sup>8</sup>.

In Nigeria, there is a lack of effective HIM systems due to the prevalence of cumbersome paper-based and disjointed health data management systems<sup>3</sup>. This can make informed healthcare decision making difficult. Just like the former US President Obama was reported to have said; "We have the most inefficient healthcare system imaginable. We're still using paper. Nurses can't read the prescriptions that doctors have written out. Why wouldn't we want to put that on an electronic medical record that will reduce error rates, reduce our long-term costs of healthcare, and create jobs right now?" (US President Barack Obama, February 9, 2009), there are ongoing similar efforts in Nigeria.

First, the Nigerian Government envisioned that the deployment of IT in health and healthcare will enhance services. The vision states that "By 2020, ICT will help enable and deliver universal health coverage in Nigeria". Among other things, it is envisioned that Health IT will achieve improved access and coverage of health services, increased uptake of health services, improved quality of care, increased financial coverage for healthcare services and increased equity in access

to and quality of health services, information, and financing<sup>9</sup>. In their response and pragmatic approach to the aforementioned vision of the Federal Government, health stakeholders are making giant strides to ensure a seamless nationwide migration from paper-based health records system into electronic health records environment. This is especially by the professional body of patients' health records managers (Association of Health Records and Information Management Practitioners of Nigeria – AHRIMPN), the regulatory agency of federal government (Health Records Officers' Registration Board of Nigeria – HRORBN) and the Federal Ministry of Health.

Notably, users' continuous training is a key determinant of the long-term viability of IT in a given organization. Unfortunately, training costs and tight implementation budgets can result in limited training prior to actual usage<sup>10</sup>. When training is readily, it is likely to be diffused more quickly within a system<sup>11</sup>. Giving this developments therefore, this scoping review sought to determine knowledge and skill gaps in information technology vis-à-vis IT training needs among HIM professionals in Nigeria according to the existing literature.

## METHODS

This is a scoping review of literature on IT knowledge and skill gaps and the need for specific training of HIM professionals in Nigeria. Search engines, which include Google Scholar, Pubmed and Pubmed Central were employed. In all, 73 published articles were downloaded, 14 articles were removed for lack of content relevance to the study and a total of 59 articles were reviewed. The review work delineates the existing gaps and training needs in IT among HIM professionals in Nigeria.

## RESULTS & DISCUSSION

### Health IT and Nigerian healthcare systems

Nigeria is witnessing continuing advocacy and increase in number of individuals yearning for computerization of health information and healthcare processes. On the other hand, the Government of this most populous black nation is evolving plans and strategies for the adoption and implementation of HIT<sup>12</sup>. Health Information Management professionals in Nigeria

acknowledged the importance of IT in managing patients' health information and were willing to improve their skills. The proportion of IT-skilled HIM professionals working in technical and leadership roles in HIT, who currently possess these skills is however not encouraging<sup>12,13</sup>. This has created many skill gaps among these professionals. Much more needs to be done with regards to IT training and retraining in order to enhance their skills and improve healthcare data management. Furthermore, the clause on IT in the existing curriculum used in Nigerian schools of health information should be upgraded to include specific software training in HIT.

Adeleke *et al.* recommended that the respective authorities make necessary IT equipment and accessories available for the transformation of theory in IT training into real practice<sup>3</sup>. An understanding of systems theory and computer technology is critical to survival in the information age. The nationwide efforts to migrate from paper-based health records system into electronic health records environment in Nigeria, has placed unprecedented emphasis on utilizing technology to improve the quality of care and to decrease healthcare costs<sup>12,13</sup>. To meet these goals, the healthcare sector will need an increase in the number of HIM professionals with the appropriate health informatics training and data analysis skills. Expectations of analytical and HIT skills have set the stage for HIM professionals to exert leadership in terms of health informatics<sup>14</sup>. As such, HIM professionals, who play leadership roles in designing health information systems require an open attitude and creative thinking in addition to their existing knowledge of health records contents, data sources and systems analysis techniques<sup>15</sup>.

### Healthcare providers' perceptions of IT in health care systems

The emerging digitization and globalization has the potentials to speed up the transformation of the current healthcare systems and revolutionize the provider-consumer relationship between healthcare providers, their patients and the public<sup>12</sup>. Much as the healthcare providers in Nigeria would have explored the benefits of the Internet but for time constraints due to workload, inadequate access and lack of technical knowhow<sup>16</sup>. Adeleke *et al.* further reported that participants generally sought for

further training in the use of computer, the Internet and specifically in e-mail management<sup>16</sup>. The Nigerian healthcare system is manned by providers and stakeholders, who are quite abreast of the benefits of HIT and are willing to embrace the technology in their workflow<sup>16</sup>. This gives hope and the tendency to prompt the healthcare decision makers to proactively formulate policies and introduce interventions that will encourage nationwide acceptance of the emerging technology<sup>16</sup>. There is however, more to be done on appropriate clinical documentation, to evolve a sound basis for effective takeoff, successful implementations and meaningful use<sup>12,17,18</sup>.

Appropriate funding and financial incentives for quality improvement is recommended. In addition, a study recommended that the National Conference on HIT should be convened annually and a technical committee be set up to appraise future implementations<sup>16</sup>. Virtually, all participants in a Nigerian study opined that ICT will improve medical care quality, but some anticipated concerns over medical confidentiality as ICT becomes widely adopted in the country's healthcare systems<sup>16</sup>. Aside their poor skill in database design and statistical analysis software, healthcare providers in the study possessed good knowledge and disposition towards ICT. This is especially for the enhancement of their professional practice and for public health quality improvement<sup>16</sup>. They indicated interest in further ICT training in order to enhance their information sources for an improved practice. It would be worthwhile to enrich their sources of information in order to improve public health<sup>19</sup>.

Most health workers in a study in Bida are capable of using computer system and do have access to the Internet, but lack the right computing skills and seldom made use of internet services<sup>20</sup>. In Ile-Ife, despite the fact that 78.7% of HIM professionals had received some forms of training, Bello *et al.* reported that only 4.3% demonstrated good knowledge of computers and IT<sup>13</sup>. Sixty-six percent had a fair knowledge and 29.7% had poor knowledge. Also, only 27.7% showed good utilization habits, while in 29.8% they were fair and in 46.6% they were poor<sup>13</sup>. This was a result of required job training, which was usually employer sponsored as opposed to the physicians and medical students, who sought training for personal and/or professional reasons<sup>13</sup>.

Surprisingly, both knowledge and utilization scores were statistically lower among HIM professionals, when compared with the medical students or physicians and may also be related to their education that are mainly at diploma level<sup>13</sup>.

Studies on IT use among Nigerian healthcare and information professionals revealed that there was a deficiency of IT skills, inadequate numbers of IT skilled professionals, lack of technical capacity to sustain IT resources, restricted use, but the desire for knowledge, a quest for formal training in IT, and flexibility<sup>13,21-25</sup>. Adeleke *et al.* specifically reported that most participants in their study knew how to use IT applications, especially Microsoft Word, Excel and Access<sup>3</sup>. Very few however reported that they could skillfully use these applications. It is important to note that the extent of their use was not determined in their study. In addition, Adeleke *et al.* noted that a significant percentage of the participants had no skill in statistical analysis<sup>3</sup>. This might explain the reason statistical analysis was the skill most sought-after by the participants in the study<sup>3</sup>.

In a study of healthcare providers in Abuja National Hospital, Adeleke *et al.* reported that most participants were advanced in the use of electronic mail and the Internet mostly acquired through self-efforts<sup>16</sup>. The study however revealed that a greater portion of participants exhibited poor knowledge of database management and statistical analysis package<sup>16</sup>. Virtually, all participants in the study opined that ICT will improve medical care quality, but some anticipated concerns over medical confidentiality as ICT becomes widely adopted in the country's healthcare systems<sup>16</sup>. In a similar vein, Adeleke *et al.* established that there is a growing awareness on HIT and the use of patients' health records for care quality in the Nigerian healthcare systems especially, among scholars in healthcare<sup>26</sup>. This gives hope of a better future for healthcare data management in the nation and calls for improved political support from the Federal Government of Nigeria by engaging HIM professionals in key decision making positions and HIM professionals and other healthcare providers should be more committed to good health records practice<sup>26</sup>.

### **Implications for health information management practice in Nigeria**

As information technology continues to permeate the healthcare systems, coupled with the rapidly changing HIM profession and evolving workplace requirements, data quality and integrity will largely depend on the quality of training handed to HIM professionals. In other words, the future of Nigerian healthcare systems depends on good health records practice. In a nation where unqualified individuals constitute good proportions of those, who manage patients' health records, where qualified healthcare providers lack basic knowledge of good health records, where good health record practice is seen as herculean task among providers and yet, where patients are becoming more interested in how their records is managed, ensuring good health records practice becomes difficult<sup>18,27-29</sup>. The HIM professionals in Nigeria must therefore develop themselves and embrace Health IT in their professional and work process.

### Limitations to the study

This is a health data quality study in a scoping review, whereas quality assessment approach are much more needed for better health data quality improvement.

### CONCLUSION

There is a gap in Health IT knowledge and skills among HIM professionals in Nigeria. This is especially in the area of statistical analysis and database management. This is a shift from expectations as HIM professionals are supposed to play leadership role in the emerging electronic health records in the country. Noteworthy to say is that these professionals are passionately seeking for advanced Health IT training and efforts must be put in place to support these professionals.

### Recommendations

Therefore, general and specific trainings in information technology are recommended for practicing HIM professionals.

#### a) General Recommendations

- i. There is need to review the curricular in schools of health information management to accommodate general and specific training needs of future HIM professionals.
- ii. The compulsory continuing professional development education should be sustained.

- iii. There is need for nationwide IT awareness for all HIM professionals across level of healthcare systems.

- iv. A need for proficiency training in Microsoft Access, Excel and PowerPoint. This is especially in Microsoft Excel, because the program is used industry-wide for data tracking and analysis.

#### b) Specific Recommendations

- i. Free training in electronic data analysis using the online Open MRS.
- ii. Proficiency in the use of Microsoft Excel and Software Package for Social Sciences (SPSS) for electronic health data analysis.
- iii. Free online CITI Biomedical Research training.
- iv. Training in software development among highly IT skilled HIM professionals.
- v. HIM professionals must take up their traditional roles in monitoring and evaluation of healthcare services, which is largely IT-driven in today's healthcare.
- vi. Data analysis is essential for better understanding of the data often collected in healthcare and during research. As such, data are as invaluable as the quality of its analysis.
- vii. Training and retraining of Nigerian HIM professionals on advance data analysis.
- viii. Orientation and re-orientation of Nigerian HIM professionals on health service research and research ethics.
- ix. Mentorship and scientific support to Nigerian HIM professionals to evolve vibrant HIM scholars.

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**Authors Contribution:**

AIT conceived of the study, initiated the design, participated in literature search, data abstraction and collection, analysis and coordination. ORO, OMM, SQB, AKO and IIA participated in the design, literature search and retrieval, technical process, data abstraction, data analysis and coordination and reviewed the final manuscript.

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