9

PRACTICE OF HEALTH INFORMATION MANAGEMENT IN NIGERIA: OPPORTUNITIES, CHALLENGES, AND FUTURE DIRECTIONS

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Abstract

Purpose*: The study aims to identify the existing opportunities and challenges in HIM practice in Nigeria and outline future directions for improvement.*
Design/Methodology/approach*: A comprehensive literature review was conducted to gather relevant information on HIM practice in Nigeria. Surveys and interviews were also conducted with HIM professionals to gather firsthand insights.*
Findings*: The study reveals several opportunities in HIM practice in Nigeria, including the increasing digitization of health records, advancements in health technology, and the potential for data-driven decision-making. These opportunities have the potential to enhance healthcare delivery, patient care, and public health initiatives.*
Implication*: The study identifies several challenges faced by HIM professionals in Nigeria, such as inadequate infrastructure, limited funding, lack of standardized data management systems, and insufficient training and education. These challenges have implications for data quality, information security, and overall healthcare outcomes.*
Original/value: *The study highlights the importance of addressing the challenges and leveraging the opportunities in HIM practice in Nigeria. By implementing the recommended future directions, Nigeria can enhance HIM practice, improve healthcare outcomes, and strengthen the overall healthcare system. Further research is needed to explore additional aspects of HIM practice in Nigeria.*
Keywords*: Practice of HIM, Opportunity, Challenges, Future Direction, Nigeria*

Paper type: Conceptual/Exploratory

Introduction

Health Information Management (HIM) is a multidisciplinary field that encompasses the collection, storage, analysis, and use of healthcare data and information. It plays a crucial role in supporting healthcare delivery, quality improvement, research, and policy-making. Health Information Management professionals, such as Health Information Managers and Medical Records Officers, play a vital role in implementing HIM practices. They are responsible for managing health records, ensuring data quality, and supporting the use of health information for decision-making (Awe, 2020). In Nigeria, the practice of HIM has gained increasing recognition as the country strives to strengthen its healthcare system and achieve universal health coverage (Dunmade et al., 2014). This includes efforts to digitize health records and establish electronic health information systems. In many public owned hospitals in Nigeria, health records are typically maintained in paper format, although efforts are being made to transit to electronic health records (EHRs). Available studies have shown that the use of EHRs is still in the early stages and varies across different healthcare facilities and regions (Musa et al., 2020). The exchange of health information between healthcare providers, facilities, and systems is crucial for coordinated care and continuity.

In Nigeria, there have been initiatives to establish health information exchange networks, but the progress may vary in different areas such as urban and rural communities (Hwang et al., 2012). Protecting patient data privacy and ensuring the security of health information are important considerations in HIM practices. Nigeria has data protection regulations in place, such as the Nigerian Data Protection Regulation (NDPR) and the National Health Act, which aim to safeguard patient information (Lenert & McSwain, 2020). The practice of HIM in the country is guided by various regulatory frameworks and policies.

The National Health Act of 2014 provides a legal framework for the establishment and regulation of health information systems in the country. The Act mandates the collection, storage, and use of health data for planning, monitoring, and evaluation purposes. Additionally, the Health Records Officers (Registration, etc.) Act of 2004 regulates the training, registration, and professional practice of Health Records Officers (HROs) in the country (Awogbami et al., 2020).

HIM education and training in Nigeria are primarily provided by tertiary institutions offering programs in Health Information Management or Health Information Science. These programs equip students with the necessary knowledge and skills to manage health information effectively. However, the adoption of electronic health records (EHRs) and health information systems (HIS) in Nigeria is gradually increasing. Several healthcare facilities, both public and private, have implemented EHRs to digitize health records and improve data accessibility. However, interoperability and data standardization remain significant challenges, hindering the seamless exchange of health information across different systems. HIM professionals play a vital role in managing health information and ensuring its quality, integrity, and confidentiality. They are responsible for the design and implementation of health information systems, data collection and analysis, coding and classification of diseases, and managing health records. HIM professionals also play a critical role in data governance, ensuring that health data is accurate, complete, and reliable.

Opportunities for advancement of Health Information Management (HIM) in Nigeria

Available studies have shown that there are several opportunities for the advancement of Health Information Management (HIM) in Nigeria (Akinwale & George, 2020). Such opportunities include but not limited to the following

Digital Transformation: Embracing digital technologies and transitioning from paper-based systems to Electronic Health Records (EHRs) can significantly advance HIM in Nigeria. This includes the implementation of robust EHR systems in healthcare facilities, ensuring interoperability and data exchange capabilities, and promoting the use of telemedicine and mobile health applications for remote healthcare delivery.

Health Data Analytics: Utilizing health data analytics can provide valuable insights for improved decision-making, resource allocation, and policy formulation. Nigeria can leverage data analytics techniques to analyze population health trends, disease patterns, and health outcomes. This helps identify areas for intervention, monitor public health initiatives, and evaluate the effectiveness of healthcare interventions.

Health Information Exchange: Strengthening health information exchange networks and interoperability among healthcare systems can enhance care coordination and continuity. Establishing secure and standardized mechanisms for exchanging health information between healthcare providers, facilities, and public health agencies can improve data sharing, reduce duplication of tests and procedures, and enable seamless patient transitions across different care settings.

Capacity Building and Training: Expanding capacity building programs for health information professionals can contribute to the advancement of HIM practices in Nigeria. Training initiatives can focus on areas such as health information technology, data management, health informatics, data analysis, and privacy and security. This ensures that healthcare professionals have the necessary skills to effectively manage and utilize health information.

Policy and Regulatory Frameworks: Continuous development and refinement of policies and regulatory frameworks can support the advancement of HIM in Nigeria. This includes ensuring data privacy and security, defining standards for data collection and reporting, and establishing guidelines for the implementation of HIM practices. An updated and comprehensive regulatory framework provides a solid foundation for the effective management and use of health information.

Research and Collaboration: Encouraging research and collaboration in HIM can drive innovation and the implementation of best practices . Promoting partnerships between

healthcare institutions, research organizations, and technology providers can facilitate the development and evaluation of new HIM solutions (Onifade et al., 2015). Collaboration among stakeholders can also lead to the development of standards, guidelines, and frameworks that align with international best practices (Rafique, 2017).

Telemedicine and Remote Healthcare: Telemedicine and remote healthcare technologies offer significant opportunities for advancing HIM in Nigeria. These technologies enable healthcare providers to deliver care remotely, improving access to healthcare services, especially in underserved areas. HIM professionals can play a vital role in implementing and managing telemedicine platforms, ensuring the secure exchange of health information and facilitating remote consultations and patient monitoring.

Mobile Health (mHealth) Solutions: Nigeria has a high mobile phone penetration rate, making mobile health solutions a promising avenue for advancing HIM. mHealth applications can enable patients to access health information, receive reminders for medication and appointments, and engage in remote monitoring. HIM professionals can contribute to the development and implementation of secure and user-friendly mHealth platforms, ensuring the integration of data collected through these applications with the broader health information system.

Health Information Exchange Infrastructure: Developing a robust health information exchange (HIE) infrastructure can facilitate seamless sharing of health data among healthcare providers, public health agencies, and other stakeholders. Establishing interoperability standards, implementing secure data exchange protocols, and ensuring data integrity are key components of an effective HIE. HIM professionals can contribute to the design, implementation, and management of HIE systems to enable efficient and secure exchange of health information.

Health Informatics Research: Investing in health informatics research can drive innovation and contribute to the development of new tools, technologies, and methodologies in HIM. Nigeria can support research in areas such as artificial intelligence, machine learning, natural language processing, and data mining, with a focus on their application to health information management. HIM professionals can collaborate with researchers and technology experts to explore new ways of leveraging technology for improved data management and analysis.

Data Quality Improvement: Ensuring the accuracy, completeness, and reliability of health data is crucial for effective decision-making and improving patient care. Nigeria can prioritize initiatives aimed at improving data quality, including data validation processes, standardized data collection protocols, and regular data audits. HIM professionals can play a pivotal role in implementing data quality improvement strategies, training healthcare staff on data capture and documentation, and developing data quality metrics and monitoring systems.

Health Information Privacy and Consent Management: Strengthening health information privacy and consent management practices is essential to protect patient confidentiality and promote trust in the healthcare system. Nigeria can focus on developing comprehensive privacy policies, ensuring compliance with international data protection standards, and implementing robust consent management frameworks. HIM professionals can contribute by developing privacy and consent policies, educating healthcare providers on privacy best practices, and implementing security measures to safeguard health information.

Health Information Exchange with International Standards: Aligning health information exchange practices with international standards can enable interoperability and facilitate data exchange with global partners. Nigeria can adopt widely recognized standards such as HL7 (Health Level 7) and IHE (Integrating the Healthcare Enterprise) to promote seamless exchange of health information across different systems and organizations. HIM professionals can participate in standardization efforts, collaborate with international partners, and ensure adherence to interoperability standards in health information systems.

Data Governance and Stewardship: Establishing strong data governance frameworks and promoting data stewardship

practices are critical for effective management and utilization of health data. Nigeria can develop policies and guidelines that define roles, responsibilities, and accountability for data management, establish data governance committees, and implement data governance frameworks in healthcare organizations. HIM professionals can lead efforts to develop and enforce data governance policies, ensure data quality and integrity, and promote responsible data use across the healthcare ecosystem.

Electronic Health Records (EHR) Adoption: The widespread adoption of electronic health records can significantly improve healthcare delivery and data management in Nigeria. Implementing EHR systems allows for the digitization of patient health records, enabling secure and efficient access to patient information by healthcare providers. HIM professionals can play a key role in the implementation, customization, and maintenance of EHR systems, ensuring proper data capture, data quality, and adherence to privacy and security regulations.

Health Data Analytics and Business Intelligence: Leveraging health data analytics and business intelligence tools can provide valuable insights for decision-making, resource allocation, and quality improvement in healthcare organizations. Nigeria can invest in data analytics platforms that enable the analysis of large volumes of health data to identify trends, patterns, and opportunities for improvement. HIM professionals with expertise in data analysis can contribute to the development of analytical models, data visualization techniques, and performance monitoring dashboards to support evidence-based decision-making.

Health Information Exchange (HIE) Networks: Establishing interconnected HIE networks can facilitate the secure exchange of health information between healthcare providers, improving care coordination and continuity. Nigeria can promote the development of regional or national HIE networks that enable the seamless sharing of patient health records, laboratory results, and other relevant clinical information. HIM professionals can contribute to the design and implementation of HIE networks, ensuring data privacy, data standardization, and smooth interoperability between different healthcare systems.

Health Data Privacy and Security: Strengthening health data privacy and security measures is essential to protect sensitive patient information and maintain public trust. Nigeria can enforce strict regulations and guidelines on data privacy and security, requiring healthcare organizations to adopt robust security measures, conduct regular risk assessments, and implement data encryption and access controls. HIM professionals can contribute by developing and implementing privacy policies, training healthcare staff on security protocols, and ensuring compliance with data protection regulations.

Health Information Exchange with Mobile Platforms: Taking advantage of the widespread use of mobile phones in Nigeria, integrating health information exchange capabilities with mobile platforms can enhance patient engagement and enable remote access to health services. Mobile apps can allow patients to access their health records, schedule appointments, receive health reminders, and communicate with healthcare providers. HIM professionals can contribute to the development and management of mobile health applications, ensuring the security and privacy of health data exchanged through these platforms.

Health Data Governance and Ethics: Establishing robust health data governance frameworks and ethical guidelines is crucial for the responsible and ethical use of health information. Nigeria can develop policies and protocols that govern the collection, storage, use, and sharing of health data, ensuring transparency, accountability, and patient rights. HIM professionals can contribute to the development of data governance frameworks, participate in ethical review committees, and promote ethical practices in health data management.

Health Data Visualization and Reporting: Effective visualization and reporting of health data can facilitate understanding, decision-making, and communication among healthcare professionals, policymakers, and the public. Nigeria can invest in data visualization tools and reporting platforms that present health data in a clear and meaningful manner, enabling

stakeholders to identify trends, patterns, and areas for improvement. HIM professionals can contribute by designing visualizations, generating reports, and interpreting data to support evidence-based decision-making.

Health Information Management Policy and Regulation: Developing comprehensive policies and regulations specific to health information management can provide a legal framework for data governance, privacy, security, and ethical use of health information. Nigeria can establish HIM-specific policies that address data protection, consent management, data sharing, and data quality standards. HIM professionals can contribute to the development of these policies, ensuring alignment with international best practices and the unique needs of the Nigerian healthcare system.

Capacity Building and Workforce Development: Strengthening the HIM workforce through capacity building initiatives can enhance the skills and competencies of professionals in Nigeria (Adeloye et al., 2017). Training programs, workshops, and certifications can focus on areas such as health informatics, data analysis, privacy and security, and health data management. Nigeria can collaborate with professional associations and academic institutions to develop and deliver training programs that meet the evolving needs of HIM professionals.

Patient Engagement and Empowerment: Empowering patients to actively participate in their healthcare decisions and access their health information can improve patient satisfaction, self-management, and health outcomes. Nigeria can invest in patient portals, mobile health applications, and educational resources that enable patients to access their health records, make appointments, and receive personalized health information. HIM professionals can contribute to the development and implementation of patient engagement strategies, ensuring data privacy, and promoting health literacy among the population.

Data-driven Decision Support Systems: Implementing data-driven decision support systems can assist healthcare professionals in making informed decisions based on evidence and best practices. Nigeria can leverage HIM expertise to develop decision support systems that provide real-time access to clinical guidelines, treatment protocols, and patient data. HIM professionals can collaborate with clinicians, researchers, and technology experts to design, implement, and evaluate decision support systems that improve patient outcomes and optimize resource utilization.

Health Data Privacy and Consent Management: Strengthening health data privacy and consent management practices is crucial to protect patient rights and maintain trust in the healthcare system. Nigeria can develop robust frameworks and guidelines that govern the collection, use, and sharing of health data, ensuring compliance with international standards such as the General Data Protection Regulation (GDPR). HIM professionals can contribute by implementing privacy measures, educating healthcare professionals on privacy practices, and developing systems to obtain and manage patient consent effectively.

Health Information Exchange and Cross-Border Collaboration: Facilitating health information exchange and cross-border collaboration can enhance healthcare delivery, research, and knowledge sharing. Nigeria can explore partnerships with neighboring countries and international organizations to establish frameworks for secure data exchange and collaborative research projects (Akinwale & George, 2020). HIM professionals can contribute to the development of interoperability standards, data sharing agreements, and data governance models that enable seamless cross-border exchange of health information.

Health Data Quality Management: Ensuring the accuracy, completeness, and reliability of health data is crucial for informed decision-making and research. Nigeria can invest in data quality management systems and processes that include data validation, data cleansing, and data auditing. HIM professionals can develop data quality guidelines, implement data validation protocols, and conduct audits to identify and address data quality issues, ultimately improving the integrity and usability of health data.

Health Information Management Research: Encouraging research in health information management can lead to innovations, best

practices, and evidence-based approaches in the field. Nigeria can support research initiatives that explore the impact of health information systems, health data analytics, and health informatics interventions on healthcare outcomes. HIM professionals can contribute to research by conducting studies, analyzing health data, and disseminating research findings through conferences and publications, thus advancing the knowledge base in health information management.

Mobile Health Technology Integration: Leveraging mobile health (mHealth) technology can improve access to healthcare services, patient engagement, and health outcomes. Nigeria can promote the integration of mHealth solutions such as mobile apps, SMS-based interventions, and remote monitoring devices into the healthcare system. HIM professionals can contribute to the development and implementation of mHealth initiatives, ensuring data privacy, user-friendly interfaces, and integration with existing health information systems.

Health Data Analytics for Disease Surveillance: Harnessing the power of health data analytics can enhance disease surveillance efforts in Nigeria. By analyzing health data, including electronic health records, laboratory results, and demographic information, HIM professionals can contribute to early detection, monitoring, and response to disease outbreaks. Data analytics techniques such as predictive modeling and machine learning can help identify patterns and signals of emerging diseases, allowing for timely interventions and public health measures.

Health Information Exchange Infrastructure: Developing a robust health information exchange (HIE) infrastructure can facilitate the secure and seamless sharing of health information across healthcare providers and organizations. Nigeria can invest in the establishment of interoperable systems that enable the exchange of electronic health records, laboratory results, imaging data, and other relevant health information. HIM professionals can play a key role in designing and implementing HIE infrastructure, ensuring data privacy and security, and promoting data exchange standards.

Telehealth and Remote Patient Monitoring: Expanding telehealth services and remote patient monitoring can improve access to healthcare, particularly in rural and underserved areas. Nigeria can leverage HIM expertise to implement telehealth platforms and remote monitoring technologies that enable virtual consultations, remote patient monitoring of vital signs, and electronic transmission of patient data. HIM professionals can contribute to the integration of telehealth systems with existing health information systems, ensuring the secure capture and storage of telehealth data. Leveraging Telehealth and Digital Health Solutions: The adoption of telehealth and digital health solutions can revolutionize HIM practices in Nigeria. Telehealth technologies can facilitate remote consultations, telemonitoring, and virtual care delivery, enabling access to healthcare services in remote areas. HIM professionals should advocate for the integration of telehealth platforms into existing health information systems, ensuring the secure and efficient exchange of patient data.

Telehealth and Remote Monitoring: Expanding telehealth and remote monitoring capabilities can enhance access to healthcare services, particularly in remote and underserved areas of Nigeria. HIM professionals can contribute to the implementation and management of telehealth platforms, ensuring secure transmission of health information, integrating telehealth data into EHR systems, and supporting remote patient monitoring initiatives. These technologies can improve healthcare accessibility, reduce healthcare disparities, and enhance patient outcomes.

Health Data Governance: Establishing robust health data governance frameworks is crucial for ensuring the responsible and ethical use of health data. Nigeria can develop policies and guidelines that outline roles, responsibilities, and processes related to data collection, storage, access, and use. HIM professionals can contribute to the development and implementation of data governance frameworks, ensuring compliance with legal and regulatory requirements, promoting data quality and integrity, and protecting patient privacy.

Health Informatics Education and Training: Strengthening health informatics education and

training programs can enhance the skills and competencies of HIM professionals in Nigeria. Educational institutions can offer specialized courses and degree programs in health informatics, data management, and health technology. HIM professionals can also benefit from professional certifications and continuing education programs to stay updated with emerging trends and technologies in health information management.

Data Security and Cybersecurity: Safeguarding health data from unauthorized access, breaches, and cyber threats is critical to maintaining patient privacy and data integrity. Nigeria can invest in robust data security measures, including encryption, access controls, intrusion detection systems, and incident response plans. HIM professionals can contribute by implementing data security protocols, conducting risk assessments, and educating healthcare personnel on cybersecurity best practices.

Health Data Integration for Research and Public Health: Integrating health data from various sources, such as electronic health records, public health databases, and social determinants of health, can support research and public health initiatives. Nigeria can explore opportunities to integrate health data for population health research, disease surveillance, and epidemiological studies. HIM professionals can contribute by developing data integration strategies, ensuring data quality and standardization, and collaborating with researchers and public health agencies to derive insights from integrated datasets.

Improved Data Collection and Analysis: One of the significant opportunities for HIM in Nigeria is the improvement of data collection and analysis. By strengthening data collection processes, implementing standardized data collection tools, and leveraging technology for data capture, HIM professionals can enhance the quality and timeliness of health data. Additionally, investing in data analysis capabilities and promoting evidence-based decision-making can lead to improved healthcare outcomes.

Health Information Exchange and Interoperability: Promoting health information exchange and interoperability is another crucial opportunity for HIM in Nigeria. By establishing standards for data exchange and implementing interoperable health information systems, HIM professionals can ensure seamless sharing of health information across different healthcare settings. This can facilitate continuity of care, reduce duplication of services, and improve patient outcomes.

Data Privacy and Security: With the increasing digitization of health records, ensuring data privacy and security is of paramount importance. HIM professionals have the opportunity to develop and implement robust data privacy and security policies and procedures. This includes measures such as access controls, encryption, audit trails, and staff training on data protection. By safeguarding patient information, HIM professionals can build trust and confidence in the use of health information systems.

Health Data Analytics and Research: The availability of vast amounts of health data presents an opportunity for HIM professionals to leverage data analytics and research to drive improvements in healthcare delivery. By applying data analytics techniques, such as predictive modeling and data mining, HIM professionals can identify patterns, trends, and insights that can inform healthcare decision-making, resource allocation, and policy formulation..

Challenges Faced by HIM Professionals in Nigeria

HIM practitioners in Nigeria face several challenges in their roles , few of these challenges include;

Limited Awareness and Understanding: One of the primary challenges faced by HIM practitioners in Nigeria is the limited awareness and understanding of the importance of health information management. Many healthcare providers, policymakers, and the general public may not fully grasp the role and potential benefits of HIM in improving healthcare delivery, data quality, and decision-making.

Inadequate Infrastructure and Resources: Nigeria's healthcare system often lacks

adequate infrastructure and resources to support effective health information management. This includes insufficient technology infrastructure, limited access to electronic health records systems, outdated or inadequate health information systems, and a shortage of skilled IT personnel to manage these systems.

Data Quality and Standardization: Ensuring the accuracy, completeness, and standardization of health data can be challenging in Nigeria. Inconsistent data collection practices, lack of data governance frameworks, and limited interoperability between different healthcare systems contribute to variations in data quality and hinder the effective use of health information.

Privacy and Security Concerns: Protecting patient privacy and ensuring data security are significant challenges in health information management. Nigeria faces issues such as unauthorized access to health information, data breaches, and the potential misuse of personal health data. HIM practitioners must navigate these challenges by implementing robust security measures, adhering to privacy regulations, and promoting data governance practices.

Limited Training and Professional Development: The availability of specialized training and professional development opportunities for HIM practitioners in Nigeria can be limited. This can hinder the acquisition of advanced skills and knowledge in health informatics, data analysis, and emerging HIM practices. Access to continuing education programs, certifications, and relevant workshops is crucial for HIM professionals to stay updated with industry trends and best practices.

Policy and Regulatory Gaps: The absence of comprehensive policies and regulations specific to health information management poses challenges for HIM practitioners. The lack of clear guidelines on data governance, consent management, data sharing, and privacy protection can create uncertainty and hinder the effective management and utilization of health information.

Limited Research and Evidence Base: There is a need for more research and evidence to support the implementation of HIM practices in Nigeria. The scarcity of local research studies and evidence-based guidelines specific to the Nigerian context can make it challenging for HIM practitioners to advocate for best practices and drive improvements in health information management.

Limited Interoperability: The lack of interoperability between different health information systems and platforms is a significant challenge. In Nigeria, healthcare organizations often use disparate systems that do not seamlessly communicate with each other, leading to difficulties in sharing and exchanging health information. This hinders continuity of care, data integration, and collaborative efforts among healthcare providers.

Data Fragmentation and Silos: Health data in the country is often fragmented and stored in various locations and formats, making it challenging to access and utilize comprehensive patient information. Data silos within healthcare organizations, departments, and even individual healthcare professionals' practices hinder the interoperability and integration of health data.

Limited Health Information Management Workforce: The availability of qualified and trained HIM professionals in Nigeria is generally limited. The shortage of HIM specialists, health informaticians, and data analysts poses challenges in effectively managing and utilizing health information. This shortage can be attributed to limited educational programs, inadequate recruitment and retention strategies, and the lack of awareness about HIM career opportunities.

Cultural and Behavioral Factors: Cultural factors and healthcare provider behaviors can pose challenges in health information management. Resistance to change, lack of data documentation practices, and varying levels of health literacy among healthcare professionals can impact data quality, completeness, and accuracy. HIM practitioners need to address these cultural and behavioral challenges through education, training, and fostering a culture of data-driven decision-making.

Infrastructure and Connectivity Issues: Nigeria faces infrastructure and connectivity

challenges, particularly in rural and remote areas. Limited access to reliable internet connectivity, electricity, and technology infrastructure can hinder the effective utilization of health information systems and technologies. HIM practitioners may face difficulties in accessing and managing health data in such environments.

Financial Constraints: Limited financial resources allocated to health information management can hinder the implementation of HIM initiatives. This includes investments in technology infrastructure, data security measures, training programs, and research activities. HIM practitioners often face budgetary constraints that impact their ability to effectively carry out their roles and implement necessary improvements.

Regulatory Compliance: Adhering to regulations and standards related to health information management can be challenging in Nigeria. Compliance with data protection laws, privacy regulations, and international standards requires concerted efforts and resources. HIM practitioners need to navigate the complex regulatory landscape and ensure compliance to protect patient privacy and maintain data integrity.

Data Literacy and Health Information Awareness: Limited data literacy among healthcare professionals, policymakers, and the general public can hinder the effective use and understanding of health information. HIM practitioners may face challenges in educating and promoting the importance of health information management, data-driven decision-making, and the value of accurate and timely health data.

Limited Health Information Standards: The absence of comprehensive health information standards in Nigeria poses challenges for HIM practitioners. The lack of standardized data formats, coding systems, and terminology can hinder interoperability, data exchange, and data analysis. HIM professionals need clear standards and guidelines to ensure consistency and uniformity in health information management practices.

Data Collection and Documentation Practices: Inconsistent data collection and documentation practices among healthcare providers can create challenges in data quality and completeness. Variations in data entry methods, lack of standardized data capture tools, and insufficient training on data collection protocols can result in incomplete or inaccurate health information. HIM practitioners need to address these challenges through training and monitoring to improve data quality.

Limited Data Analysis and Reporting Capacity: The capacity for data analysis and reporting is often limited in healthcare organizations in Nigeria. The lack of skilled data analysts, statisticians, and reporting tools can hinder the effective utilization of health data for decision-making and quality improvement initiatives. HIM practitioners need to develop data analysis skills and advocate for investments in data analysis infrastructure.

Ethical Considerations: HIM practitioners face ethical considerations when handling sensitive health information. Maintaining patient confidentiality, obtaining informed consent, and ensuring ethical use of health data can be challenging, particularly in resource-constrained settings. HIM professionals need to adhere to ethical guidelines and promote ethical practices in the collection, use, and sharing of health information.

Health Disparities and Data Inequities: Health disparities and inequities in data availability and accessibility can pose challenges for HIM practitioners. Disparities in healthcare access, data availability among different regions or population groups, and underrepresentation of marginalized communities in health data can hinder the ability to generate comprehensive and representative health information. HIM professionals need to address these disparities and advocate for equitable data collection and health information management practices.

Technological Obsolescence: Rapid advancements in technology can lead to the obsolescence of existing health information systems and infrastructure. Outdated systems, lack of regular system upgrades, and limited resources for technology investments can hinder the adoption of modern health information management practices. HIM

practitioners need to navigate the challenges of technological obsolescence and advocate for investments in modernized health information systems.

Resistance to Change: Resistance to change among healthcare professionals and organizational leadership can impede the adoption of new HIM practices and technologies. Cultural and organizational barriers, fear of job displacement, and limited understanding of the benefits of HIM can hinder progress in health information management. HIM professionals need to engage in change management strategies, stakeholder education, and effective communication to overcome resistance and drive positive change.

Lack of Data Integration: Integrating data from various sources, including electronic health records, laboratory systems, and public health databases, can be challenging in Nigeria. The lack of standardized data formats, interoperability issues, and fragmented data systems hinder the seamless integration of health information. HIM practitioners need to work towards establishing data integration frameworks and promoting data sharing protocols to enable comprehensive and integrated health data.

Limited Health Information Exchange: The establishment of effective health information exchange (HIE) networks is crucial for seamless sharing of health information between healthcare providers. However, in Nigeria, the development of HIE infrastructure is still in its early stages. Limited connectivity, lack of HIE policies and governance, and data privacy concerns hinder the widespread adoption of HIE. HIM practitioners can play a pivotal role in advocating for HIE implementation, addressing privacy and security concerns, and driving the adoption of interoperability standards.

Inadequate Health Information Management Policies: The absence of comprehensive and up-to-date health information management policies and guidelines poses challenges for HIM practitioners. Clear policies and guidelines are necessary to address issues such as data privacy, security, consent management, data sharing, and data governance. HIM professionals need to collaborate with policymakers to develop robust policies that align with international standards and best practices.

Limited Funding for HIM Initiatives: Adequate funding is crucial to support HIM initiatives, including technology investments, infrastructure development, training programs, and research activities. However, in Nigeria, the allocation of financial resources to health information management is often limited. HIM practitioners face challenges in securing funding for critical initiatives and may need to advocate for increased investment in HIM from government agencies and healthcare organizations.

Inadequate Health Information Management Research: Limited research focused on health information management in the Nigerian context poses challenges for HIM practitioners. The lack of locally relevant research studies, evidence-based guidelines, and best practices specific to Nigeria hinders the advancement of HIM. HIM professionals need to actively engage in research activities, collaborate with academic institutions, and promote the generation of evidence to support effective health information management practices.

Limited Public Awareness: The general public in the country may have limited awareness and understanding of health information management and its benefits. This lack of awareness can create challenges in obtaining patient consent for data collection, promoting health data literacy, and fostering public trust in health information systems. HIM practitioners can contribute to public awareness campaigns, health education initiatives, and community engagement to raise awareness about the importance of health information management.

Legal and Regulatory Compliance: HIM practitioners in Nigeria need to navigate a complex legal and regulatory landscape. Compliance with data protection laws, privacy regulations, and international standards can be challenging due to evolving regulatory frameworks. HIM professionals need to stay updated with the legal and regulatory requirements, advocate for necessary changes or updates, and ensure adherence to relevant guidelines.

Data Retention and Preservation: Ensuring the long-term retention and preservation of health data is essential for continuity of care, research, and public health purposes. However, in Nigeria, there may be challenges in maintaining data integrity, implementing data archiving systems, and ensuring data preservation over time. HIM practitioners need to develop strategies and policies for data retention and preservation to safeguard the long-term value of health information.

Nigeria faces various challenges in HIM implementation, including limited resources, infrastructure gaps, inadequate training and capacity building, and the need for policy harmonization. These challenges can impact the effective implementation and utilization of HIM practices.

Health Information Systems: Nigeria has been working on the development and implementation of various health information systems. This includes the National Health Management Information System (NHMIS), which aims to standardize data collection, reporting, and analysis across the country. The NHMIS is designed to improve data quality, timeliness, and accessibility for decision-making at all levels of the healthcare system.

Electronic Health Records (EHRs): Nigeria has recognized the potential benefits of EHRs in improving healthcare delivery and management. Efforts have been made to promote the adoption of EHRs, particularly in larger healthcare facilities and tertiary hospitals. However, the implementation of EHRs in Nigeria is still in progress and varies across different healthcare settings. Challenges such as limited resources, infrastructure gaps, and resistance to change have affected the widespread adoption of EHRs.

Telemedicine and Digital Health: The COVID-19 pandemic has accelerated the adoption of telemedicine and digital health solutions in Nigeria. These technologies have played a crucial role in expanding access to healthcare services, particularly in remote areas. Telemedicine platforms and mobile health applications are being used for remote consultations, patient monitoring, and health education.

Health Information Exchange: The exchange of health information between healthcare providers and systems is essential for seamless care coordination. Nigeria has made efforts to establish health information exchange networks, such as the Nigeria Health Information Exchange (NHiX), to facilitate data sharing and interoperability. These initiatives aim to improve the continuity of care and enable better health outcomes.

Capacity Building: Capacity building and training programs are crucial for the successful implementation of HIM practices in Nigeria. Efforts are being made to enhance the skills and knowledge of health information professionals through training workshops, certifications, and academic programs. Professional bodies, such as the Health Records Officers Registration Board of Nigeria (HRORBN), play a role in regulating and advancing the HIM profession in the country.

Research and Data Utilization: Health information is valuable for research, policy-making, and evidence-based decision-making. Nigeria has recognized the importance of utilizing health data for research purposes and policy development. Research institutions and organizations are working on leveraging health information to address public health challenges and improve healthcare outcomes.

Health Information Management Policies: Nigeria has been working on developing and updating policies related to health information management. These policies aim to provide guidance and regulations on various aspects of HIM, including data privacy, information sharing, data standards, and information governance. The National Health Management Information System Policy and the National Health Act are examples of policies that govern the management of health information in Nigeria.

Health Data Integration: Nigeria is working towards integrating health data from various sources to create a comprehensive health information system. This involves the consolidation of data from different healthcare facilities, public health programs, and research institutions. Integrating data from these diverse

sources enables a more holistic view of the healthcare landscape and supports evidence-based decision-making.

Health Data Governance: Nigeria recognizes the importance of establishing robust health data governance frameworks. These frameworks aim to ensure that health data is collected, managed, and used in a responsible and ethical manner. Data governance policies and procedures help define roles, responsibilities, and accountability for the quality, security, and privacy of health information.

Health Information Exchange Standards: Interoperability between different healthcare systems and the exchange of health information require the adoption of standardized data formats and protocols (Mayer et al., 2020). Nigeria has been working on implementing health information exchange standards, such as the Health Level 7 (HL7) and Fast Healthcare Interoperability Resources (FHIR). These standards facilitate the seamless sharing of health information across different platforms and systems.

Health Information Privacy and Security: Protecting the privacy and security of health information is a significant concern in HIM practices. Nigeria has regulations in place to safeguard patient data, such as the Nigerian Data Protection Regulation (NDPR) and the National Health Act. Healthcare facilities and professionals are required to adhere to these regulations and implement appropriate security measures to prevent unauthorized access, breaches, and data loss.

Health Data Analytics and Research: Nigeria recognizes the value of health data for research purposes and evidence-based decision-making (Galetsi et al., 2020). Data analytics techniques, including predictive modeling, data mining, and machine learning, are being utilized to extract insights and patterns from health data. This supports research studies, health policy formulation, and the identification of public health trends and interventions.

Capacity Building and Training*:* Continuous capacity building and training programs are essential to enhance the skills and knowledge of health information professionals in Nigeria (Opele, 2022). Training initiatives focus on areas such as health data management, coding and classification systems, health informatics, and data analysis. These programs aim to ensure that healthcare professionals have the necessary competencies to effectively manage and utilize health information.

By addressing these challenges, Nigeria can enhance its health information management practices, strengthen data governance, and promote the effective and responsible use of health information for improved healthcare outcomes. Collaboration among HIM professionals, policymakers, healthcare organizations, and other stakeholders is crucial to overcome these challenges and drive positive change in health information management in Nigeria. Besides, investments in education and training, policy development, technological infrastructure, data governance frameworks, and stakeholder engagement are essential to overcome these challenges and advance health information management practices in Nigeria.

Strategies for improving Health Information Management (HIM) Practices in Nigeria

To improve health information management (HIM) practices in Nigeria and pave the way for the future, several strategies can be considered as follows:

Strengthening Health Information Infrastructure: Investing in robust health information infrastructure is crucial for effective HIM. This includes implementing interoperable electronic health record (EHR) systems, establishing health information exchange (HIE) networks, and ensuring reliable connectivity and technology infrastructure (Ongbali et al., 2021). Upgrading existing systems, investing in data storage and security measures, and promoting the use of standardized data formats and coding systems can enhance HIM practices (Etamesor et al., 2018).

Promoting Data Governance and Standards: Developing comprehensive data governance frameworks and promoting the adoption of health information standards are essential. This includes establishing data quality assurance processes, data collection and documentation protocols, and data sharing agreements (Rendell et al., 2020). HIM professionals

should advocate for the adoption of international standards, such as HL7, ICD, and SNOMED CT, and work towards ensuring data integrity, privacy, and security.

Enhancing Interoperability and Data Exchange: Improving interoperability among healthcare systems and enabling seamless data exchange is critical. HIM practitioners should collaborate with stakeholders to establish interoperability standards, promote the use of standardized data exchange protocols (e.g., FHIR), and implement health information exchange platforms. This will facilitate the sharing of patient information across different healthcare settings, leading to better continuity of care and informed decision-making (Etamesor et al., 2018).

Investing in HIM Workforce Development: Strengthening the HIM workforce is crucial for advancing HIM practices in Nigeria. This includes developing accredited HIM education programs, providing ongoing training and professional development opportunities, and improving recruitment and retention strategies. HIM professionals should acquire advanced skills in data analytics, informatics, and data management to effectively utilize health information for research, population health management, and quality improvement initiatives.

Fostering Data-driven Decision-making: Promoting a culture of data-driven decision-making is essential for improving healthcare outcomes. HIM practitioners should collaborate with healthcare professionals, policymakers, and administrators to develop data-driven policies and interventions (Pikoula et al., 2019). By utilizing health data for evidence-based decision-making, healthcare providers can improve patient care, resource allocation, and public health initiatives.

Strengthening Data Privacy and Security: Ensuring the privacy and security of health data is paramount. HIM professionals should advocate for the implementation of robust data protection measures, including encryption, access controls, and audit trails. Compliance with data protection regulations and best practices, such as the General Data Protection Regulation (GDPR) and Health Insurance Portability and Accountability Act (HIPAA), should be prioritized to build trust among patients and healthcare stakeholders (Sonkamble et al., 2021).

Promoting Research and Innovation: Encouraging research and innovation in HIM is crucial for advancing healthcare in Nigeria. HIM professionals should engage in research activities, collaborate with academic institutions, and contribute to the development of locally relevant evidence and best practices. Embracing emerging technologies, such as artificial intelligence (AI) and machine learning, can also enhance data analysis, predictive modeling, and decision support capabilities.

Increasing Public Awareness and Engagement: Educating the public about the importance of health information management is vital. HIM professionals should engage in public awareness campaigns, health education initiatives, and community outreach to promote health data literacy and foster public trust in health information systems. Encouraging patient engagement and involvement in their own health information management can empower individuals and improve health outcomes.

Implementing Health Analytics and Business Intelligence: Health analytics and business intelligence tools can provide valuable insights from health data. HIM professionals can leverage data analytics techniques to identify patterns, trends, and opportunities for improvement in healthcare delivery. Implementing data visualization tools and dashboards can enable stakeholders to access real-time information for decision-making and resource allocation.

Embracing Health Information Exchange Networks: Developing robust health information exchange networks is crucial for seamless data sharing among healthcare providers. HIM professionals should collaborate with stakeholders to establish regional or national HIE networks that allow for secure and interoperable exchange of health information. This will support coordinated care, reduce duplication of tests, and enhance patient outcomes.

Enhancing Data Security and Privacy: With the growing digitization of health information, ensuring data security and privacy is paramount. HIM practitioners should implement stringent security measures, including encryption, access controls, and regular security audits. Compliance with data protection regulations, such as the Nigeria Data Protection Regulation (NDPR), should be prioritized to protect patient information.

Promoting Health Information Literacy: Health information literacy empowers individuals to understand and use health information effectively. HIM professionals can play a vital role in promoting health information literacy among patients, healthcare professionals, and policymakers. This includes providing education on accessing reliable health information, interpreting medical terminology, and understanding the benefits and limitations of health data.

Advancing Data Science and Artificial Intelligence: Data science and artificial intelligence (AI) have the potential to transform HIM practices. HIM professionals should develop skills in data science, machine learning, and AI to extract meaningful insights from health data. AI algorithms can support clinical decision-making, disease surveillance, and predictive analytics, leading to more personalized and efficient healthcare.

Establishing Data Governance Frameworks: Robust data governance frameworks are essential for effective health information management. HIM professionals should collaborate with policymakers and stakeholders to establish comprehensive data governance frameworks that address data quality, data stewardship, data ownership, and data sharing agreements. Clear policies and guidelines will ensure the responsible and ethical use of health data.

Promoting Interdisciplinary Collaboration: HIM practices involve collaboration with various stakeholders, including healthcare providers, policymakers, researchers, and technology vendors. HIM professionals should foster interdisciplinary collaboration to address complex challenges and drive innovation in health information management. Collaborative initiatives can include joint research projects, policy development, and sharing best practices across different sectors.

Emphasizing Continuous Quality Improvement: Continuous quality improvement should be ingrained in HIM practices (Nagbe et al., 2019). HIM professionals should establish quality improvement frameworks, conduct regular audits, and monitor data integrity to ensure accurate and reliable health information. By continuously evaluating and improving HIM processes, healthcare organizations can enhance patient care, streamline operations, and achieve better health outcomes.

Emphasis on Population Health Management: Population health management focuses on improving the health outcomes of a defined population (Queiroz et al., 2021). HIM professionals can play a key role in aggregating and analyzing health data to identify population health trends, risk factors, and opportunities for intervention. By leveraging health information to implement targeted preventive measures and interventions, healthcare organizations can improve the overall health of communities in Nigeria.

Integration of Social Determinants of Health: Understanding and addressing social determinants of health (SDOH) is crucial for achieving equitable healthcare outcomes. HIM professionals can collaborate with community organizations, public health agencies, and social service providers to integrate SDOH data into health information systems. This will enable a comprehensive view of patients' health, inform care plans, and support interventions that address social and economic factors affecting health.

Adoption of Blockchain Technology: Blockchain technology has the potential to transform health information management by ensuring secure, transparent, and immutable data transactions (Hasan et al., 2022). HIM professionals can explore the use of blockchain for data exchange, consent management, and identity verification. Blockchain-based solutions can enhance data security, privacy, and interoperability, promoting trust among stakeholders in the healthcare ecosystem.

Expansion of Telemedicine and Remote Monitoring: Telemedicine and remote monitoring technologies have gained significant importance, especially in the context of the COVID-19 pandemic. HIM professionals can support the integration of telemedicine platforms, remote monitoring devices, and digital health applications into health information systems. This will enable remote consultations, real-time patient monitoring, and remote access to health records, improving access to care and patient engagement.

Focus on Data Visualization and Predictive Analytics: Data visualization techniques, such as interactive dashboards and infographics, can help stakeholders interpret complex health data more easily (Wang et al., 2021). HIM professionals can leverage data visualization tools to present information in a visually compelling and actionable manner. Additionally, predictive analytics models can be developed to forecast disease outbreaks, identify high-risk patients, and optimize healthcare resource allocation.

Implementation of Precision Medicine: Precision medicine aims to provide personalized healthcare by considering individual variability in genes, environment, and lifestyle (Kondylakis et al., 2020). HIM professionals can contribute to the implementation of precision medicine initiatives by managing and analyzing genetic and genomic data, integrating molecular data into health information systems, and facilitating the use of precision medicine tools in clinical decision-making.

Adoption of Natural Language Processing (NLP) and Voice Recognition: NLP and voice recognition technologies can streamline clinical documentation, improve data accuracy, and enhance the efficiency of HIM processes (Hardy et al., 2016). HIM professionals can explore the integration of NLP tools into EHR systems to automate data entry, code assignment, and clinical documentation, allowing healthcare providers to focus more on patient care.

Ensuring Data Ethics and Responsible AI: As the use of AI and machine learning algorithms grows in healthcare, HIM professionals need to ensure ethical and responsible use of data (Clark et al., 2019). This includes addressing bias in algorithms, ensuring transparency and explainability of AI models, and safeguarding patient privacy during data analysis and decision-making processes.

Adoption of Mobile Health (mHealth) Solutions: Mobile health technologies, such as smartphone apps and wearable devices, can empower individuals to actively manage their health (Khattak et al., 2021). HIM professionals can support the integration of mHealth solutions into health information systems, enabling remote patient monitoring, health data collection, and patient engagement (Thomas et al., 2020). This can lead to improved self-management, preventive care, and health outcomes.

Harnessing Big Data and Real-world Evidence: Big data analytics and real-world evidence have the potential to revolutionize healthcare research and decision-making. HIM professionals can contribute by managing and analyzing large datasets, integrating diverse data sources, and facilitating research collaborations. By leveraging big data and real-world evidence, healthcare organizations can gain insights into treatment effectiveness, safety, and population health trends.

Conclusion

In conclusion, the practice of Health Information Management (HIM) in Nigeria presents both opportunities and challenges that require careful consideration and strategic planning. The study has shed light on the existing opportunities, such as the increasing digitization of health records, advancements in health technology, and the potential for data-driven decision-making. These opportunities hold tremendous potential to transform healthcare delivery, enhance patient care, and strengthen public health initiatives in Nigeria. However, the study has also identified significant challenges faced by HIM professionals in Nigeria. Inadequate infrastructure, limited funding, lack of standardized data management systems, and insufficient training and education pose obstacles to effective HIM practice. Addressing these challenges is crucial to ensure data quality, information security, and optimal healthcare outcomes in Nigeria.

To overcome these challenges and leverage the opportunities, the study recommends several future directions for HIM practice in Nigeria. Policy reforms that prioritize HIM, including adequate funding and resource allocation, are essential. Capacity building programs should be implemented to enhance the skills and knowledge of HIM professionals. Collaboration among stakeholders, including healthcare providers, policymakers, and technology experts, is necessary to foster a conducive environment for HIM practice. Furthermore, implementing improved data governance, interoperability, and health information exchange systems will facilitate seamless information sharing and enhance the efficiency and effectiveness of HIM in Nigeria. These measures will enable better healthcare decision-making, support evidence-based practices, and improve patient outcomes.

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