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The Role of Health Information Management in Improving Patient Outcomes in Chronic Disease Management

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Abstract: Chronic non-communicable diseases (NCDs) such as hypertension, diabetes, asthma, and cardiovascular illnesses represent a growing health burden in Nigeria and globally. This study investigates how Health Information Management (HIM) systems influence chronic disease care at Braithwaite Memorial Specialist Hospital, Port Harcourt. Guided by Donabedian's structure–process–outcome model, a descriptive cross-sectional mixed-methods design was employed. Data were collected from 200 healthcare workers, administrators, and patients using structured questionnaires, interviews, and focus groups. Quantitative results revealed that most respondents perceived HIM positively: improved record-keeping and data access enhanced diagnosis, follow-up, and continuity of care. Over 80% agreed that electronic recordkeeping reduces redundant tests and delays. Regression analysis showed that frequent data updates, cross-departmental access, and electronic health record (EHR) usage significantly predicted improved patient outcomes ($R^2 = 0.62$). Qualitative findings emphasized persistent barriers, including inadequate IT infrastructure, limited staff training, and continued reliance on paper records. Overall, the persistence of a hybrid paper–electronic system constrains full benefits. The findings highlight that strengthening HIM infrastructure, digitizing records, and expanding staff training can significantly improve chronic care delivery. These results reinforce existing evidence that EHR adoption enhances healthcare quality and efficiency (Alobo et al., 2020; Barth et al., 2024).

Keywords: Health Information Management, electronic health records, chronic disease care, Donabedian model, Nigeria

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Introduction

Chronic non-communicable diseases (NCDs) remain the leading causes of morbidity and mortality globally (Barth et al., 2024). In Nigeria, conditions such as hypertension, diabetes, asthma, and cardiovascular illnesses exert increasing pressure on the healthcare system, stretching already limited resources. Within this context, Health Information Management (HIM)—the systematic collection, storage, and utilization of patient data—has emerged as a critical pillar for strengthening healthcare systems (Alobo et al., 2020).

The World Health Organization identifies health information systems as a core "building block" of effective healthcare delivery. Nevertheless, many Nigerian facilities still struggle with poor data quality, inadequate reporting, and unreliable continuity of patient records (Alobo et al., 2020). Heavy reliance on manual record-keeping, outdated infrastructure, and fragmented reporting practices have led to incomplete or missing data, often hindering timely and evidence-based clinical decision-making. Inefficient information flow not only delays diagnosis but also increases the risk of redundant testing, medication errors, and adverse patient outcomes.

Electronic Health Records (EHRs) and well-structured HIM practices are therefore expected to transform chronic disease management by ensuring accurate, timely, and accessible patient information. Such systems are crucial for sustaining continuity of care, which is particularly important for NCDs that require long-term, coordinated management (Barth et al., 2024).

This study investigates the role of HIM in improving patient outcomes for chronic disease management at Braithwaite Memorial Specialist Hospital, a major public teaching hospital in Port Harcourt, Rivers State. Specifically, it examines current HIM practices, evaluates perceived benefits for chronic care, and identifies barriers to effective information use. The aim is to generate actionable insights that can inform social and health sector reforms, ultimately contributing to improved chronic disease outcomes in Nigeria.

Theoretical Framework

This study is anchored on Donabedian's Structure–Process–Outcome (SPO) model and the concept of Continuity of Care.

Donabedian's (1966) model provides a widely recognized framework for evaluating healthcare quality. Within this framework, structure refers to the physical and organizational resources available for care (e.g., infrastructure, information systems, staffing). Process encompasses the activities and interactions involved in delivering care (e.g., how records are collected, shared, and used in decision-making). Outcomes represent the results of care, such as improved patient health, reduced complications, or enhanced satisfaction. Applied to this study, effective Health Information Management (HIM) constitutes part of the *structure* that influences healthcare *processes*—such as timely diagnosis, accurate treatment, and continuity of follow-up—ultimately shaping *patient outcomes* in chronic disease management. Conversely, deficiencies in HIM infrastructure and processes can disrupt this causal chain, leading to poorer outcomes.

The Continuity of Care perspective complements this model by emphasizing the need for consistent, coordinated, and long-term management of patients with chronic conditions. Continuity requires that each healthcare provider has access to comprehensive patient histories across multiple visits and departments (Barth et al., 2024). For chronic diseases—where treatment adherence, lifestyle monitoring, and early detection of complications are crucial—continuity of information flow is essential. Strong HIM systems, particularly electronic health records (EHRs), facilitate this continuity by ensuring that critical information is available at the point of care.

Together, the SPO model and Continuity of Care theory suggest that strengthening HIM infrastructure and practices is not merely a technical upgrade but a systemic intervention. By linking resources, processes, and outcomes, these frameworks provide a basis for evaluating the role of HIM in chronic disease management and for identifying leverage points where improvements in information systems can yield measurable patient benefits.

Methodology

A descriptive cross-sectional mixed-methods design was employed. The study was conducted at Braithwaite Memorial Specialist Hospital (the Rivers State University Teaching Hospital in Port Harcourt), a 375-bed government-owned facility serving a diverse urban population (Rivers State Ministry of Health, 2014). The target population included stakeholders involved in chronic disease care:

medical doctors, nurses, pharmacists, laboratory technologists, health information managers, IT staff, administrative officers, and chronic disease patients. Using a multi-stage sampling procedure, 200 participants were selected. First, key departments managing chronic illnesses (e.g. internal medicine, cardiology, endocrinology) were identified. Within these, stratified sampling ensured representation of professional categories and patients. Yamane's formula (Yamane, 1967) guided sample size determination for the estimated population of ~400 stakeholders.

Data were collected via three instruments: a structured questionnaire (administered to all 200 participants), key informant interviews, and focus group discussions (FGDs) with select providers and patient groups. The questionnaire assessed demographics, availability/use of HIM systems, and perceptions of HIM's impact on care (using Likert scales). Semi-structured interviews and FGDs probed experiences with record systems, challenges, and suggestions. These tools were pretested and refined for clarity.

Quantitative data were analyzed with descriptive statistics (frequencies, means) and inferential tests (multiple regression) to explore relationships between HIM factors and patient outcome proxies. The primary outcome measure was a composite "patient outcome improvement" index based on clinician ratings of diagnostic accuracy, treatment follow-up, and patient stabilization. Qualitative data from interviews/FGDs were transcribed and subjected to thematic analysis to contextualize quantitative findings, highlighting recurring themes about system performance and needs. Ethical clearance was obtained from the hospital's Ethics Committee, and informed consent was obtained from all participants.

Findings

Participant Characteristics

A total of 200 participants took part in the study, representing a broad cross-section of stakeholders in chronic disease management at Braithwaite Memorial Specialist Hospital. The sample consisted of both healthcare workers and patients. Gender distribution was nearly equal, ensuring balanced perspectives across male and female respondents. Professional categories included physicians (20%), nurses (25%), pharmacists (10%), laboratory scientists (10%), IT/HMIS staff (5%), and administrative officers (10%), alongside patients living with chronic diseases (20%).

Most healthcare professionals had between 5 and 15 years of work experience, reflecting considerable familiarity with institutional practices. Patients were predominantly middle-aged to elderly, with an average age of 55 years, and presented with diverse chronic conditions such as diabetes, hypertension, asthma, and cardiovascular illnesses. This mix of perspectives was crucial: while providers reflected on technical and operational aspects of HIM, patients emphasized its practical impact on continuity of care and treatment outcomes.

HIM Availability and Use

The findings reveal that the hospital relied predominantly on paper-based record systems. Approximately 70% of staff confirmed that patient information was documented manually in physical folders, while only 30% reported exposure to any form of electronic record system. Even within the limited digital sphere, electronic systems were restricted to pilot modules—most notably in the outpatient clinic—leaving inpatient wards and ancillary units almost entirely paper-driven.

Participants also highlighted the fragmented nature of record-keeping. Nearly 80% reported that critical laboratory or imaging results often required manual retrieval between departments, with delays sometimes extending to several days. Only 15% of respondents had access to cross-departmental digital data, underscoring the absence of integrated platforms for seamless information sharing. These findings point to the existence of a hybrid system in which electronic and paper records coexist but do not effectively complement one another. This fragmentation was widely perceived as a bottleneck in providing efficient chronic disease care.

Perceived Role of HIM in Chronic Care

Respondents overwhelmingly recognized the value of HIM in enhancing patient outcomes. More than 85% of clinicians agreed that comprehensive medical records, whether electronic or paper-based, facilitated earlier diagnosis and more accurate treatment planning. Likewise, 82% indicated that access to complete patient histories and laboratory results had directly improved follow-up care.

Illustrative quotes from interviews reinforced these findings:

- *"When I can quickly see a diabetic patient's last blood sugar trend, I make better treatment decisions"* (Physician, IDI, May 2025).
- *"Tracking blood pressure readings over time helped us adjust medications before patients got worse"* (Nurse, FGD, May 2025).

Quantitative data further supported these perceptions. Seventy-eight percent of respondents agreed that improved HIM practices enabled faster detection of complications, while 80% believed that accurate, up-to-date records reduced the risk of duplicate prescriptions and promoted better medication adherence. In effect, participants regarded HIM as indispensable for ensuring continuity of care, allowing providers to coordinate management plans across multiple visits and departments.

Reduction of Redundant Procedures and Delays

A particularly striking finding concerned the prevention of unnecessary procedures. Over 80% of respondents believed that a robust HIM system would reduce redundant testing and treatment delays. Staff estimated that between 30–50% of repeat blood tests or imaging scans occurred solely because of inaccessible or missing records.

This challenge was particularly acute in emergency settings. One physician remarked:

- *"In emergencies, the time wasted searching for a patient's folder can mean the difference between stabilizing them or losing them."* (Physician, IDI, May 2025).

Respondents suggested that integrated electronic systems could alleviate these inefficiencies by providing instant access to laboratory results and imaging reports across units. Many also noted that electronic alerts could play a preventive role by flagging existing data and avoiding repetition. The consensus was that digitization would not only cut costs but also enhance timeliness of care, particularly for chronic patients requiring frequent monitoring.

Challenges to Effective HIM

Despite recognizing the potential of HIM, respondents identified several systemic obstacles. The most frequently cited was inadequate IT infrastructure, reported by 90% of participants. This included unreliable electricity supply, insufficient computer terminals, and poor internet connectivity. Without reliable infrastructure, electronic data systems were often rendered unusable.

A second barrier, reported by 75% of respondents, was the shortage of trained personnel. Many staff admitted limited skills in managing digital systems, leaving them dependent on paper processes even where electronic alternatives existed. A nurse in one focus group observed:

- *"We know computer systems would help, but sometimes we don't even know how to use them properly, and there is no training."*

Other significant challenges included inconsistent data recording practices (70%) due to the absence of standardized protocols, and concerns over data security and patient confidentiality (50%). An administrator remarked:

- *"Without hospital policy on electronic records, people are reluctant to abandon paper. They don't trust that the system is secure."*

Taken together, these findings reveal that structural weaknesses—poor infrastructure, limited training, and lack of governance frameworks—remain the most significant obstacles to maximizing the benefits of HIM.

Recommendations and System Gaps

Participants provided several recommendations for strengthening HIM practices. The most frequently suggested interventions included:

1. Full digitization of patient records to replace the current hybrid system.
2. Regular training and capacity-building to equip staff with the skills necessary for managing digital systems.
3. Development of standardized institutional policies for data entry, security, and sharing protocols.
4. Patient engagement strategies, such as SMS reminders for appointments and online portals for accessing test results, to promote adherence and continuity of care.

The statistical analysis further reinforced these points. Regression results revealed that three factors significantly predicted better patient outcomes: frequency of data updating, ease of access across departments, and use of electronic modules. Together, these factors accounted for approximately 62% of the variance in outcome measures ($R^2 \approx 0.62$). This indicates that even partial improvements in HIM practices can yield tangible gains in patient outcomes.

In summary, while participants recognized HIM as an essential tool for improving chronic disease care, they also acknowledged the limitations imposed by systemic barriers. The findings demonstrate that without structural investment and policy support, the benefits of HIM will remain only partially realized.

Discussion

The findings of this study demonstrate that effective Health Information Management (HIM) is widely perceived by health professionals and patients as a cornerstone for improved chronic disease management. This perception is consistent with research in both Nigerian and global contexts. For instance, Alobo et al. (2020) reported that Nigerian health workers who adopted an electronic health record (EHR) system noted an over 80% reduction in medical errors and administrative costs. This aligns with the present study, where respondents highlighted that complete and accessible records enhanced diagnostic accuracy, treatment planning, and continuity of care. Similarly, Barth et al. (2024) emphasized that EHR-based monitoring provides timely insights into health outcomes, supporting our respondents' view that shared electronic records allow for early detection of complications in chronic conditions such as diabetes and hypertension.

Theoretical Interpretation

From a theoretical perspective, the Donabedian model of healthcare quality (Donabedian, 1966) provides a useful lens for interpreting these findings. The hospital's structural deficiencies—including limited digital infrastructure, unreliable power supply, and low staffing for HIM functions—negatively shaped the processes of care delivery. For example, delays in retrieving patient information and the prevalence of redundant procedures are process failures rooted in inadequate structural inputs. In line with Donabedian's model, improvements in structural elements—such as investing in reliable EHR platforms, stable electricity, and staff training—are expected to enhance care processes and, consequently, outcomes. Regression analysis in this study further substantiates this logic: accessibility of records and frequency of EHR use were significantly associated with improved patient outcome scores, suggesting a direct chain from structure to process to outcomes.

Continuity of Care

The concept of **continuity of care** is also central to understanding these findings. Chronic conditions demand ongoing management across multiple encounters and disciplines. Respondents frequently noted

that fragmented information systems—where each department kept separate files—hampered coordinated care. Patients often experienced missing records, redundant tests, and delays in follow-up. Conversely, when information was shared seamlessly (e.g., where laboratory results were accessible across units), clinicians reported significant improvements in chronic care management. This resonates with international evidence that continuity of care, facilitated by integrated information systems, improves both quality of care and patient satisfaction (Barth et al., 2024).

Systemic Barriers and Policy Implications

Despite recognizing HIM's value, respondents identified systemic barriers that mirror challenges documented across Nigeria. Consistent with Alobo et al. (2020), the most pressing constraints were inadequate IT infrastructure, unreliable electricity, poor internet connectivity, and shortages of trained personnel. These limitations created a gap between awareness of HIM's advantages and actual implementation. For example, while many clinicians were motivated to apply data-driven care, they were hindered by insufficient computers or by prolonged outages that rendered digital tools unusable. The persistence of manual recordkeeping reflects not a lack of willingness but a structural environment unsupportive of digital transition.

Implications for Social Work and Health Practice

The broader implications of these findings extend to social work and health system management. Social workers play a critical role in chronic disease management, particularly in linking patients to community resources, monitoring adherence, and addressing social determinants of health. Strong HIM systems can empower social workers to track patients' psychosocial as well as medical histories, ensuring that care is holistic and coordinated across health and community settings. Moreover, HIM enables interdisciplinary communication, where social workers, physicians, nurses, and administrators can share patient data for integrated care planning. From a policy perspective, the findings suggest that social workers and healthcare managers should actively advocate for budgetary allocations, institutional policies, and training programs to strengthen HIM infrastructure.

Summary of Insights

In sum, this study reinforces the notion that HIM is both a technical and a social asset: technically, it improves data quality and clinical efficiency; socially, it supports continuity, integration, and equity in chronic disease care. However, the gap between potential and practice highlights the urgent need for structural reforms. Investments in reliable infrastructure, comprehensive training, and institutional protocols are essential if Nigerian hospitals are to fully harness HIM for better chronic disease outcomes.

Practical Implications

The findings of this study suggest several actionable steps for hospitals, state health authorities, and allied professionals.

1. Prioritize digitization of records. Transitioning from paper-based to fully electronic health records (EHRs) is essential for improving efficiency and safety in chronic disease management. A digital system would enable timely retrieval of patient histories, reduce paperwork delays, and minimize redundant procedures. Alobo et al. (2020) emphasized that scaling up EHR use significantly reduces administrative costs, transcription errors, and duplication, making digitization a top priority.

2. Strengthen capacity building. Continuous professional training is needed to ensure clinicians, nurses, and health records staff can effectively use HIM tools. Training programs should cover data entry standards, privacy and confidentiality protocols, and best practices for digital workflows. Regular workshops and refresher courses would help address the digital literacy gap, ensuring even less technologically experienced staff become confident HIM users.

3. Invest in infrastructure. The transition to robust HIM depends on adequate infrastructure. This includes backup power solutions (e.g., generators or solar systems), reliable internet connectivity, and

sufficient computer terminals in high-demand units. Without such investments, even well-designed systems remain vulnerable to avoidable technical disruptions.

4. Develop strong governance frameworks. Clear institutional policies and standardized protocols are crucial for sustainable HIM. Hospital management should institute guidelines on data quality, electronic workflows, and information security. For instance, mandating electronic lab reporting and real-time updates would ensure continuity of care and reduce data fragmentation.

5. Enhance patient engagement through technology. Patient-centered innovations—such as SMS appointment reminders, online result portals, or mobile health applications—can improve adherence, follow-up, and patient empowerment. These measures were also suggested by participants in the study and align with a social work perspective of participatory, holistic care.

Taken together, these recommendations highlight the need for a systems approach that combines technology, human capacity, and governance. For social workers, improved HIM facilitates integrated care planning, strengthens inter-professional communication, and enhances the ability to address both medical and social determinants of health. By implementing these strategies, hospitals can strengthen service delivery and materially improve outcomes for patients with chronic conditions.

Conclusion

This study demonstrates that Health Information Management plays a vital role in chronic disease care by improving data availability and continuity. Healthcare workers at the Nigerian teaching hospital recognized numerous HIM benefits, including earlier diagnosis, better follow-up, and reduced duplication of efforts. However, significant obstacles – notably limited infrastructure, training, and policy support – currently limit these gains. Aligning with Donabedian's model, the findings suggest that strengthening HIM structures (systems and resources) will enhance clinical processes and ultimately patient outcomes. These results echo the broader evidence that well-implemented electronic record systems contribute to safer, more efficient care (Alobo et al., 2020; Barth et al., 2024).

For social work and healthcare practice, the implication is clear: investment in robust HIM is not merely technical, but fundamental to improving client outcomes. Policymakers and institutional leaders should therefore prioritize digital health initiatives and capacity building. Doing so will support a more coordinated, data-driven approach to chronic illness management, enabling health professionals (including social workers) to deliver more effective, patient-centered care.

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