

CODING ACCURACY AND INDEXING EFFECTIVENESS IN NIGERIAN HEALTHCARE DELIVERY: A STUDY OF THE FEDERAL MEDICAL CENTRE, YENAGOA

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Abstract: This article reports a study that set out to examine how accurately health records are coded at the Federal Medical Centre, Yenagoa, Bayelsa State, and how well the indexing of those records supports the timely retrieval of patient information. Health information management remains one of the quieter engines of hospital performance, yet many hospitals across Nigeria continue to wrestle with coding mistakes and slow, unreliable filing systems. A cross sectional survey was carried out among seventyfive Health Information Management staff, using a structured questionnaire built around the everyday realities of coding and indexing work. The results paint a picture that is encouraging in parts and sobering in others. Staff clearly understand the coding guidelines they are expected to follow and appreciate why proper indexing matters, yet coding errors have not gone away. Thin training budgets, weak supervision, and little room for continuing professional development all play a part. On a brighter note, the study found that when records are properly indexed, retrieval times fall and the wider hospital workflow benefits. What indexing has not managed to solve, at least not yet, is the recurring problem of duplicated or missing records. Taken together, the findings suggest that coding and indexing already contribute something real and measurable to healthcare delivery at the centre, but their full potential will not be reached until training, supervision, and the technological backbone behind these processes are strengthened. The article closes with a set of practical recommendations, among them regular refresher training, a proper supervisory structure, and renewed investment in modern health information systems.

Keywords: Coding Accuracy, Indexing Effectiveness, Health Information Management, Record Retrieval, Healthcare Efficiency.

1. INTRODUCTION

Accurate coding and indexing of health information sit at the foundation of any healthcare system that hopes to run smoothly. Together they make sure that what happens to a patient, every diagnosis, every procedure, every test, is written down properly, filed sensibly, and can be found again when it is needed for clinical work, hospital administration, or research. Coding takes the messy, individual detail of a patient encounter and turns it into a standardised alphanumeric code, usually drawn from systems such as the International Classification of Diseases or Current Procedural Terminology.

Indexing then takes those codes and arranges them so that anyone who needs them, a doctor chasing a history, an administrator preparing a report, can lay their hands on the right file quickly.

Inside the clinic, coding gives everyone a shared language. A diagnosis coded correctly means a clinician anywhere in the hospital can pick up a chart and understand at a glance what is wrong with a patient, what has already been tried, and what the treatment plan looks like. This matters most when several different professionals are involved in a single patient's care, since continuity depends on everyone reading from the same page. Good coding also protects patients in a more direct way, cutting down on repeated tests, mismatched treatments, and medication mistakes that tend to creep in when records are unclear (American Health Information Management Association, 2023; World Health Organization, 2019).

Coding also underwrites the financial side of a hospital's life. Bills, insurance claims, and reimbursement all depend on codes being right. When they are, hospitals get paid fairly and on time for the care they provide. When they are not, claims bounce back, payments stall, money is lost, and sometimes legal or compliance headaches follow.

Indexing is coding's quieter partner. It takes the coded information and makes it usable, arranging records so they can be pulled up without delay, which matters enormously in busy facilities generating large volumes of paperwork every day. Good indexing underlies clinical audits, quality checks, disease surveillance, and the broader planning work that keeps a health system pointed in the right direction (World Health Organization, 2019; American Health Information Management Association, 2023).

In Nigeria, interest in getting coding and indexing right has grown alongside efforts to modernise health information systems more broadly. A handful of tertiary and secondary hospitals have brought in electronic health records, but a great many facilities still lean on manual paper based systems. Those manual systems tend to come with the same familiar problems: documentation errors, slow retrieval, and record keeping that falls apart under pressure.

A number of factors keep coding and indexing from working as well as they should in Nigerian hospitals. Training is often inadequate. Skilled coders are in short supply. Clinical documentation itself is sometimes incomplete before it even reaches the coding desk. Updated coding manuals are not always available, and supervision is frequently thin on the ground. Add to this the familiar infrastructural troubles, unreliable power, patchy internet, and limited digital equipment, and it becomes easier to see why data management struggles in many settings.

The knock on effects are significant. Coding and indexing that fall short compromise the quality of the data hospitals rely on, which in turn weakens clinical decisions, misdirects resources, and lowers the standard of care patients receive. Hospital revenue suffers too, and the statistics used for planning and policy at a national level become less trustworthy. Reliable health data underpins almost everything else, tracking disease patterns, judging whether a programme is working, and making evidence informed decisions possible in the first place.

Even though the importance of coding and indexing is widely recognised, many Nigerian hospitals still find it hard to put good practice into daily operation. This gap between recognition and reality is what prompted the present study, which looks closely at coding accuracy and indexing effectiveness, and the challenges and possibilities surrounding them, within the Nigerian context.

1.1 Statement of the Problem

Notwithstanding everyone agreeing that accurate coding and indexing matter, actually achieving them remains really difficult in Nigeria. Training gaps, heavy workloads, incomplete clinical documentation, and limited access to current coding guidelines all conspire to produce coding errors and indexing that falls short of what is needed. The result is health information that is less reliable and less useful than it should be.

Many Nigerian healthcare facilities still lean on manual or outdated systems, and the absence of modern digital tools that could automate coding and streamline data management only makes matters worse. Without these tools, inaccuracies creep in and patient information takes longer to retrieve, both of which chip away at clinical decision making and the continuity of care patients receive. There is a financial cost too. Small coding mistakes lead to rejected claims and delayed payments, draining revenue and making it harder for hospitals to stay financially steady. Poor indexing carries its own price, since records that cannot be found quickly translate into delayed diagnoses, longer patient waiting times, and procedures repeated unnecessarily.

There is a wider consequence too. When coding and indexing fall short, the health data used for planning, policy, and disease surveillance becomes less trustworthy. Incomplete or unreliable data can produce misleading statistics, poor decisions about where resources should go, and weaker public health responses generally. This limits how well the health system can respond when new challenges emerge.

Even though the importance of coding and indexing is widely acknowledged on paper, there is still surprisingly little local evidence showing exactly how these practices shape service delivery and system efficiency in Nigerian settings. Without that evidence, hospital managers and policymakers are left guessing about where to invest in training or technology. This study aims to close that gap by examining coding accuracy and indexing effectiveness at the Federal Medical Centre, Yenagoa.

1.2 Objectives of the Study

The study was guided by two objectives, namely:

1. To assess the level of accuracy in coding and indexing practices at Federal Medical Centre, Yenagoa.
2. To examine the influence of effective indexing on the timely retrieval of patients' records.

1.3 Research Questions

The study answers two questions, namely:

1. What is the level of accuracy in coding and indexing practices at Federal Medical Centre, Yenagoa, Bayelsa State?
2. To what extent does effective indexing influence the timely retrieval of patients' records at Federal Medical Centre, Yenagoa?

1.4 Significance of the Study

This study offers real world evidence on how coding accuracy and indexing effectiveness shape healthcare efficiency, and it does so in a setting where research of this kind has been thin on the ground. It looks at how these practices play out in daily service delivery and how they shape the overall quality of health information. For hospital administrators and managers, the findings show concretely how better coding and indexing can cut down on inefficiency and support quicker clinical decisions, which should feed directly into policy, resource allocation, and investment decisions around staff training and health information technology.

Health information management professionals stand to benefit from a clearer picture of where current practice falls short and what might be done to lift both coding accuracy and record retrieval. The findings also give some direction to continuing professional development programmes aimed at strengthening the competence of practitioners already in the field.

For policymakers and health planners, the study offers evidence that can support decisions about upgrading health information systems, sharpening the accuracy of health statistics, and encouraging data driven decision making at both local and national levels. It also adds to the wider body of knowledge on coding and indexing in low resource settings, where empirical evidence has been in short supply.

1.5 Scope of the Study

This study is limited to coding accuracy and indexing effectiveness at the Federal Medical Centre in Yenagoa, Bayelsa State. Accurate coding and effective indexing serve as the independent variables here, while the timely retrieval of patients' records is treated as the dependent variable. The focus falls specifically on Health Information Management practitioners at FMC Yenagoa, since they are the ones directly responsible for coding and indexing health records. Other categories of hospital staff, clinicians, nurses, and administrative personnel outside the Health Information Management department, fall outside the scope of this work. Geographically, the study is restricted to FMC Yenagoa and does not extend to other healthcare facilities in Bayelsa State or elsewhere in Nigeria, so its findings should be read as specific to the institution studied.

2. LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 The Concept of Coding

Coding, in a healthcare setting, is the process of converting the clinical information written into a patient's medical record into standardised alphanumeric codes. These codes stand in for diagnoses, procedures, and the various services a patient receives, and they are usually drawn from established systems such as the International Classification of Diseases and Current Procedural Terminology. Using these shared systems lets hospitals document and manage health information consistently, no matter where the care is delivered (World Health Organization, 2019; American Health Information Management Association, 2023).

Coding can also be understood as the careful matching of appropriate codes to clinical services in support of administrative processes such as billing, reimbursement, and insurance claims. Done correctly, it ensures providers are properly paid for the care they deliver, which is why coding sits so close to the financial stability of a healthcare organisation (O'Neill, Carter, and Smith, 2021). Beyond that, coding provides a structured way of classifying medical information that promotes accuracy, consistency, and comparability across patient records and between institutions (Bowman, 2021).

Beyond its financial and administrative roles, coding also helps organise and make use of health data more broadly. Translating clinical documentation into standardised codes makes it much easier to store, retrieve, and analyse patient information, which supports efficient records management and lets providers pull up relevant patient data quickly when they need it. Coding also allows hospitals, researchers, and public health authorities to generate statistics, carry out research, and track disease patterns across a population (World Health Organization, 2019).

Accurate coding also lifts the quality of patient care by reducing the errors that creep into medical records. It cuts down on duplicated tests and procedures and supports better coordination between healthcare professionals. When patient information is coded clearly and organised sensibly, communication improves, decisions get made faster, and hospital operations run more smoothly overall (Olowookere, Adebayo, and Adeyemo, 2018).

Coding performs several distinct functions that keep a healthcare system ticking over. One of the most important is supporting clinical decision making. Properly coded diagnoses and procedures let clinicians understand a patient's history and current condition at a glance, which reduces error and supports informed treatment choices (Bowman, 2021). Another key function sits in the financial and reimbursement side of hospital life. Providers depend on coded data to prepare bills and process claims, and accurate coding ensures the services delivered are correctly recorded and presented for payment, helping hospitals receive fair reimbursement from government and private insurers alike. Coding mistakes, by contrast, tend to produce rejected claims and delayed payments, financial losses that can genuinely threaten a facility's long term survival (American Health Information Management Association, 2023).

2.1.2 The Concept of Accurate Coding

Accurate coding is the precise translation of a patient's diagnosis and the procedures carried out into standardised alphanumeric codes, following global systems such as the International Classification of Diseases and Current Procedural Terminology (World Health Organization, 2019; American Health Information Management Association, 2023). As a central part of Health Information Management, coding underpins everything from clinical records and billing to hospital administration and research, essentially compressing complex patient data into a format that is easy to share and act on across the healthcare system (Bowman, 2021).

The main purpose of accurate coding is to ensure medical records genuinely reflect a patient's condition and the care they received. Done well, it improves communication among healthcare professionals, letting them understand a patient's history, current treatment, and ongoing needs. Accurate coding also supports clinical decision making by giving reliable information that can guide treatment choices and care planning, and coded data forms the backbone of health reporting and statistical analysis, letting facilities monitor disease patterns, evaluate outcomes, and assess how efficiently services are being delivered (O'Neill, Brown, and Smith, 2021).

Inaccurate coding, on the other hand, creates real problems. Errors can delay or sink insurance claims, cost hospitals revenue, misallocate resources, and compromise patient care. These errors tend to arise from several sources at once, inadequate training of coding personnel, heavy workloads and time pressure, unclear or incomplete clinical documentation, and simple failure to follow coding standards (American Health Information Management Association, 2023; O'Neill et al., 2021). The damage is not only financial. Unreliable health data also hinders research, planning, and policy work more broadly.

At FMC Yenagoa specifically, accurate coding matters because the hospital operates as a tertiary care centre handling a high volume of patients with complex conditions. In a facility like this, precise coding lifts operational efficiency by keeping patient records complete and easy to retrieve, which lets clinicians make timely, well informed decisions. Maintaining coding accuracy therefore feeds directly into FMC Yenagoa's overall performance, the quality of patient care it delivers, and the broader efficiency of the health system it serves (Olowookere, Adebayo, and Adeyemo, 2018).

2.1.3 The Concept of Indexing

Indexing refers to the deliberate, systematic organisation of patient records and coded clinical information so that it can be stored, retrieved, and used efficiently and meaningfully (O'Malley and Harris, 2022; American Health Information Management Association, 2023). It is a key part of Health Information Management because it complements coding, keeping the data that codes represent accessible and useful for the many purposes a hospital needs it for. Where coding converts clinical documentation into standardised codes, indexing organises that coded data so it can be found quickly in the course of daily work.

Effective indexing lets healthcare professionals locate patient records promptly and accurately, which supports timely clinical decisions and better continuity of care (Smith, Nguyen, and Taylor, 2023). In a large tertiary facility like FMC Yenagoa, where thousands of records are generated every year, proper indexing matters even more. Being able to quickly pull up a patient's previous diagnoses, treatment plans, and lab results helps clinicians understand a patient's health history, avoid repeating tests unnecessarily, and plan appropriate care, all of which feeds into better outcomes and stronger service delivery.

Indexing typically involves assigning reference points, patient names, identification numbers, medical record numbers, diagnosis codes, and procedural codes, to medical records. These reference points act as entry keys that make classification, grouping, and retrieval possible in both paper based and electronic systems (American Health Information Management Association, 2023; O'Malley and Harris, 2022). Without proper indexing, records get misfiled, misplaced, or become difficult to find, and the consequences show up as longer patient waiting times, needless duplication of diagnostic tests, and disruption to clinical workflow.

Indexing also plays a role well beyond day to day clinical operations. Indexed records form the basis of accurate reporting, disease trend surveillance, resource utilisation reviews, and public health planning (Lee and Patel, 2021). Administrators and policymakers depend on well indexed data to identify where needs exist, allocate resources sensibly, and judge how well health programmes are performing. When indexing is inconsistent, the integrity of the underlying data suffers along with it.

2.1.4 Relationship between Coding, Indexing, and Healthcare System Efficiency

Accurate coding and proper indexing are closely linked functions within Health Information Management, and both play important roles in lifting the effectiveness of a healthcare system. Coding standardises clinical information so that diagnoses, treatments, and procedures are represented consistently. Indexing then organises this information so healthcare professionals can locate and retrieve records quickly when they need them (American Health Information Management Association, 2020). Together, these two functions make sure patient data is both reliable and accessible, which is essential for delivering high quality healthcare.

Healthcare system efficiency refers to a facility's ability to provide services that are timely, safe, and effective while making the best use of the resources it has, personnel, finances, and equipment among them (World Health Organization, 2010). When patient information is accurate and easy to retrieve, clinicians can make better decisions, cut down on treatment

delays, and avoid repeating diagnostic procedures unnecessarily. All of this feeds into better patient outcomes and stronger operational performance.

Studies bear this out in practice. Bowman (2013) found that rigorous coding procedures go hand in hand with fewer billing errors, faster claims processing, and stronger revenue generation. Along similar lines, O'Neill, Carter, and Smith (2021) reported that effective indexing speeds up record retrieval, cutting patient waiting times and freeing staff to focus on direct patient care.

Where coding and indexing fall short, the opposite tends to happen. Lost or misfiled records, repeated diagnostic tests, inaccurate billing, and unreliable health information all become more common, and these problems can compromise patient safety, drag down staff productivity, and undermine a hospital's financial footing (Olowookere, Adebayo, and Adeyemo, 2018).

2.2 Theoretical Framework

This study rests on Information Processing Theory, proposed by Galbraith (1973). The theory holds that organisations perform well when they can systematically collect, process, store, and share information accurately and on time. It stresses that an organisation's performance is tied closely to how efficiently information flows and how well personnel can access, interpret, and apply data in making decisions.

Applied to healthcare, Information Processing Theory highlights why high quality, accessible health information matters so much for system efficiency. Accurate clinical coding standardises patient information, while proper indexing organises that information so it can be retrieved efficiently. When both are done well, hospitals process information for clinical, administrative, and financial purposes far more smoothly, which in turn improves service delivery, cuts operational delays, and supports better resource management (Bowman, 2013; O'Neill, Carter, and Smith, 2021).

Galbraith (1973) also noted that organisations handling large volumes of information need systems and processes that reduce uncertainty and keep information accurate. At FMC Yenagoa, accurate coding and systematic indexing help minimise the uncertainty around patient records, billing data, and administrative reports, which allows healthcare professionals to make timely decisions, reduce errors, and use personnel, finances, and equipment more wisely.

This theory suits the present study because it offers a lens for evaluating how improvements in information processing can lift hospital workflow generally. Effective coding and indexing cut delays in record retrieval, reduce errors, and support better resource allocation, and this framework lets the study assess systematically how strengthened information management processes improve operational performance within a hospital.

2.3 Empirical Review

Adler Milstein and Jha (2017) looked at how adopting electronic health records affects hospital performance, with particular attention to efficiency, data sharing, and clinical coordination. Hospitals with stronger electronic health record integration showed better documentation quality, less duplication of clinical tests, and improved communication between departments. A limitation worth flagging is that the study centred on technologically advanced systems in the United States, which limits how far its conclusions travel to lower resource settings such as Nigeria.

Kruse and colleagues (2018) carried out a systematic review of health information systems and found that electronic systems improve efficiency, reduce medical errors, and widen access to patient information. Despite its strengths, the review suffers from combining studies with quite different designs, sample sizes, and outcome measures, and it does not deal adequately with implementation barriers such as infrastructure gaps, unreliable power, and workforce readiness.

O'Malley and colleagues (2019) examined physician documentation patterns and how they affect coding accuracy, finding that incomplete or inconsistent clinical documentation contributes significantly to coding errors, which then ripple into billing and data quality problems. The study's main limitation is its narrow focus on physicians, without much consideration of the broader health information management workflow around them.

Bowman (2021) showed that standardised clinical coding systems significantly reduce billing errors and improve consistency in health records, a foundational contribution to how the field understands the importance of structured coding.

Even so, the study reflects an earlier generation of health information systems that differ quite a bit from today's digital environments.

Olowookere, Adebayo, and Adeyemo (2018) looked at health information management practices in tertiary hospitals in southwestern Nigeria and found widespread inconsistencies in clinical documentation, incomplete coding, and frequent misfiling of patient records, all of which contributed to delays in patient care and duplicated diagnostic services. The study is limited by its focus on tertiary hospitals in a single geopolitical zone.

Adedokun and Afolayan (2020) investigated how competent health information personnel were at coding and indexing across Nigerian hospitals, finding that many records officers lacked formal certification and adequate training in International Classification of Diseases coding standards, a gap that fed directly into coding errors and weaker indexing practice. The study relies on self reported data, which is worth bearing in mind when weighing its conclusions.

Garcia and Lopez (2020) studied indexing systems and their effect on hospital record retrieval efficiency, finding that electronic indexing systems significantly reduce retrieval time and speed up clinical decision making. The work is limited because it drew only on a small group of hospitals in one country, which makes it hard to generalise the findings elsewhere, and it leaned heavily on retrieval speed without paying as much attention to the accuracy of what was retrieved.

Quinn and Harris (2019) examined hospital record management systems and found that indexing errors contribute significantly to discharge delays and administrative inefficiency. A drawback of this work is its retrospective design, which restricts how confidently causal conclusions can be drawn, and it does not distinguish between errors caused by human input and those arising from system design flaws.

Lawrence and Smith (2021) analysed the relationship between indexing accuracy and overall hospital system performance, finding a strong positive correlation between well organised indexing and healthcare delivery efficiency. The study relies heavily on correlation analysis, which does not establish causation, and it does not account for outside factors that might also be shaping performance outcomes.

Chukwu and Eze (2019) investigated record management and indexing problems in Enugu State hospitals, finding frequent misfiling, record duplication, and delays in retrieving patient information, and concluded that poor indexing systems are a major barrier to effective healthcare delivery in Nigeria. The study's descriptive design and lack of statistical modelling limit how far its findings can be pushed.

Okeke and Chinedu (2020) studied how indexing systems affect patient record accessibility in Nigerian hospitals, finding that inefficient indexing significantly increases retrieval time and delays clinical decisions, and recommended better indexing frameworks alongside staff training. The study is limited by a small sample size and a narrow geographic spread.

Uche and Nnamdi (2021) examined manual indexing systems in Nigerian hospitals and their effect on retrieval efficiency, finding that manual indexing significantly increases retrieval time, with many hospitals experiencing delays running well past thirty minutes per record request. The study does not compare manual systems against electronic or hybrid alternatives.

Omole and Adebayo (2022) looked at how digital record systems changed indexing efficiency in Nigerian hospitals, finding that digital systems cut record retrieval time by over half and improved organisational efficiency overall, though they noted that inadequate training and poor infrastructure limit how fully these systems can deliver on their promise.

Okafor and Nwosu (2020) examined inconsistencies in coding and indexing practice in Nigerian tertiary hospitals, finding that outdated coding systems, inconsistent application of International Classification of Diseases guidelines, and poor documentation practices all contribute to inaccurate health records, and concluded that a lack of standardisation remains a major challenge for Nigerian health information management systems.

Ibrahim and Musa (2021) studied systemic challenges affecting health information management in Nigerian hospitals, finding that inadequate infrastructure, insufficient staffing, and the absence of dedicated Health Information Management departments significantly reduce efficiency in coding and indexing. The study is descriptive in nature and does not test causal relationships directly.

Blaya and colleagues (2019) examined electronic health record implementation in resource limited settings, finding that digital systems improve data availability and reduce paper based documentation errors, while also noting that inconsistent power supply, lack of technical support, and limited training significantly hinder how effective these systems can be in practice.

Mekonnen and colleagues (2020) studied health information system performance in sub Saharan African hospitals, finding that poor infrastructure and inadequate training significantly reduce data quality and system efficiency. The study remains largely descriptive and does not establish causal relationships between the variables it examines.

2.4 Summary of Literature Review

The literature reviewed here establishes that accurate clinical coding and systematic indexing are core components of effective Health Information Management and are essential to improving healthcare system efficiency. Clinical coding translates diagnoses, procedures, and services into standardised classification systems, while indexing organises that coded data to ensure it can be stored, retrieved, and used efficiently.

This study is anchored in Information Processing Theory, which explains organisational efficiency as a function of how well information is collected, processed, stored, and retrieved. Within that framework, coding represents the accuracy of information processing, while indexing reflects the efficiency of information retrieval.

The empirical evidence suggests that better coding accuracy and more efficient indexing go together with stronger hospital performance. Much of the existing evidence, however, is built on cross sectional and correlational designs, which limits how confidently causal relationships can be established. Evidence from developing countries and African contexts in particular shows that structural and operational challenges significantly affect how well coding and indexing systems function. These challenges include inadequate infrastructure, a shortage of trained personnel, heavy workload, weak enforcement of standards, and limited digital integration.

Within the Nigerian healthcare system specifically, studies consistently report that incomplete coding, misfiled records, and weak indexing practice contribute to inefficiencies in service delivery, delayed patient care, and duplicated diagnostic procedures. Despite this body of knowledge, a significant gap remains around empirical evidence from tertiary healthcare institutions in Bayelsa State, and the Federal Medical Centre, Yenagoa in particular. This study sets out to address that gap.

3. METHODOLOGY

3.1 Research Philosophy

This study is grounded in the positivist research philosophy, which places weight on objectivity, measurable variables, and quantitative methods for examining the relationships between variables. Positivists hold that reality exists independently and can be observed, measured, and understood through data in an objective way (Creswell and Creswell, 2018). Since this research focuses on the measurable impact of coding and indexing on hospital efficiency, a positivist approach fits well. The study used structured questionnaires to gather numerical data and applied statistical tests to see how different factors relate to one another. Working within this framework, the study treats coding accuracy and system efficiency as clear, measurable facts that can be tested to produce solid evidence and support broader conclusions.

3.2 Research Design

This study adopted a cross sectional research design, an approach well suited to collecting data at a single point in time and analysing the relationships between variables without needing a long period of observation. Specifically, it allowed the study to assess how accurate coding and effective indexing relate to healthcare system efficiency. Using this design let the study capture a snapshot of current practice and outcomes, offering insight into the existing state of Health Information Management at FMC Yenagoa. The cross sectional approach also fit naturally with the quantitative methods used, structured questionnaires and statistical analysis, to identify correlations and test the study's underlying assumptions.

3.3 Study Area

This research was carried out at the Federal Medical Centre in Yenagoa, Bayelsa State. As a major federal teaching hospital, FMC Yenagoa provides specialist medical care, trains healthcare staff, and hosts medical research (World Health

Organization, 2016), and it functions as the primary referral hub for Bayelsa State and the wider Niger Delta, handling the most complex cases in the region. The Health Information Management Department at FMC Yenagoa is responsible for processing medical records, carrying out coding and indexing, and ensuring patient information is properly stored and can be retrieved. Given the hospital's heavy patient load and the complexity of its clinical services, accurate coding and efficient indexing matter a great deal for supporting decision making, reducing delays in service delivery, and keeping overall operations running efficiently (Bowman, 2013).

3.4 Study Population

The study population consists of the entire Health Information Management team at the Federal Medical Centre, Yenagoa. According to the hospital's Human Resources Department, there are approximately eighty staff members in this unit, and these professionals handle the daily management of medical records, with a particular focus on coding, indexing, and the storage and retrieval of patient data.

This group was chosen because its members are the most familiar with the technical workflows and obstacles involved in coding and indexing at the facility, and their first hand experience helps ensure the data collected is both accurate and grounded in practical reality (Olowookere, Adebayo, and Adeyemo, 2018).

3.5 Sample Size and Sampling Technique

Since the population involved was manageable in size, this study adopted a census approach, targeting every Health Information Management staff member at the Federal Medical Centre, Yenagoa, for participation. A census approach suits this context well because it gives every staff member involved in coding and indexing an opportunity to take part, producing a comprehensive and accurate picture of practice within the facility (Saunders, Lewis, and Thornhill, 2019).

Using a census removed the sampling error that can arise from working with only a subset of the population, and it allowed the study to capture the full range of experiences, insights, and challenges that staff encounter in managing medical records. This mattered particularly in a specialised setting like Health Information Management, where the number of personnel is limited and each staff member holds critical knowledge about how the workflow actually operates.

3.6 Data Collection Instrument

The primary instrument for data collection was a structured questionnaire developed by the researcher, designed to systematically capture quantitative data on coding practices, indexing effectiveness, and healthcare system efficiency as perceived by Health Information Management personnel at FMC Yenagoa.

The questionnaire was divided into four main sections. Section A gathered demographic information, including age, gender, educational qualification, and years of experience. Section B focused on coding practices, covering knowledge of coding standards, adherence to protocols, and coding accuracy. Section C explored indexing methods and how efficiently records could be retrieved. Section D examined healthcare system efficiency indicators, including service delivery quality and patient waiting time.

For Sections B, C, and D, a five point Likert scale was used, where 1 represents Strongly Disagree and 5 represents Strongly Agree. This scaling let respondents' perceptions and experiences be quantified in a way that supports meaningful statistical analysis (Saunders, Lewis, and Thornhill, 2019).

3.7 Validity and Reliability of the Instrument

To confirm the research instrument was sound, the study focused first on establishing content validity. The structured questionnaire was reviewed by three experts in Health Information Management as well as other experienced researchers in the field, whose evaluation focused on whether the questionnaire adequately covered coding practices, indexing effectiveness, and healthcare system efficiency. Their feedback was used to refine the instrument further (Creswell and Creswell, 2018).

The questionnaire was also pre tested on ten Health Information Management staff at a comparable health facility outside FMC Yenagoa. This pre test helped identify ambiguities, unclear wording, and potential difficulties respondents might face, and allowed the researcher to revise the questionnaire for clarity, comprehension, and general usability before it was administered in full (Saunders, Lewis, and Thornhill, 2019).

Reliability was checked using the Cronbach's Alpha coefficient, with a benchmark of 0.7 or higher considered acceptable for this study. Data from the pre test were used to compute the coefficient, and any items showing low correlation with the overall scale were revised or dropped to strengthen the reliability of the instrument.

3.8 Method of Data Collection

The researcher personally administered the structured questionnaires to all Health Information Management personnel at FMC Yenagoa, following prior approval from hospital management. Administering the questionnaires in person allowed the researcher to give clear instructions, clarify questions where needed, and make sure respondents understood every item, which improved both the quality and completeness of the data collected (Creswell and Creswell, 2018).

Before the questionnaires were distributed, respondents were briefed on the purpose of the study, and it was made clear that participation was voluntary and that the information provided would be used solely for research purposes. Informed consent was obtained from each participant to ensure ethical compliance and to respect the rights and autonomy of everyone involved (Saunders, Lewis, and Thornhill, 2019).

3.9 Method of Data Analysis

Questionnaires were analysed using SPSS version 26. Each response was converted into a numerical value based on the five point Likert scale, with higher scores representing better performance or stronger agreement. Descriptive statistics, frequencies, percentages, means, and standard deviations, were used to summarise staff demographics and their feedback, giving a clear, organised picture of the overall experiences and views shared by the Health Information Management team.

For interpretation purposes, a mean score of 3.0 or above was treated as acceptable, while scores below 3.0 were regarded as unacceptable. Statistical significance was set at $p \leq 0.05$.

3.10 Ethical Considerations

Before data collection began, ethical clearance was secured from the relevant institutional review boards and from FMC Yenagoa's leadership, ensuring the study followed the required ethical codes for research involving human subjects (Creswell and Creswell, 2018). Participation was entirely voluntary. Every participant received a full explanation of the study's goals, what would be asked of them, and any risks or benefits involved. Signed consent was collected before data collection began, and it was made clear that participants could withdraw at any point without facing any negative consequences (Saunders, Lewis, and Thornhill, 2019).

Privacy and anonymity were strictly protected throughout. The data collected was used for research purposes only, and names or staff identification numbers did not appear anywhere in the analysis or the final report. All files, whether digital or physical, were stored securely and accessible only to authorised members of the research team.

4. RESULTS AND DISCUSSION

4.1 Questionnaire Administration and Response Rate

A total of eighty questionnaires were administered using a census approach. Of these, seventy five were properly completed and returned, while five were either not returned or were invalid, giving a response rate of 93.75 percent. This high response rate strengthens the reliability and validity of the study by minimising non response bias and ensuring the target population was adequately represented.

Table 1: Questionnaire Administration and Response Rate

Questionnaires Distributed	Returned	Valid	Invalid	Response Rate
80	75	75	5	93.75%

Source: Field Survey, 2026

4.2 Demographic Characteristics of Respondents

Table 2: Gender Distribution

Gender	Frequency	Percentage (%)
Male	28	37.3
Female	47	62.7
Total	75	100

The results show that the majority of respondents were female, suggesting that this profession is predominantly staffed by women, a pattern that may shape workplace practices, attitudes, and perceptions around coding and indexing.

Table 3: Age Distribution

Age Group	Frequency	Percentage (%)
20 to 29	18	24.0
30 to 39	32	42.7
40 to 49	19	25.3
50 and above	6	8.0
Total	75	100

Most respondents fell within the 30 to 39 age bracket, representing an active and productive segment of the workforce. This age group tends to combine professional maturity, adaptability to new technology, and hands on experience, which lends extra credibility to their responses.

Table 4: Educational Qualification

Qualification	Frequency	Percentage (%)
OND / NCE	12	16.0
HND	31	41.3
BSc / BHIM	24	32.0
MSc / MPH	8	10.7
PhD	0	0.0
Total	75	100

Most respondents held tertiary level qualifications, which suggests they have the intellectual grounding and professional competence needed to understand and apply coding and indexing standards properly.

Table 5: Years of Experience

Experience	Frequency	Percentage (%)
1 to 5 years	22	29.3
6 to 10 years	28	37.3
11 to 15 years	15	20.0
16 years and above	10	13.3
Total	75	100

A good proportion of respondents brought considerable work experience with them, which strengthens the credibility of the data, since respondents with this kind of exposure are likely to have real practical familiarity with coding and indexing practice.

4.3 Analysis Based on Research Objectives

4.3.1 Objective One: Assessment of Coding Accuracy

Table 6: Coding Practices

Statement	Mean	Decision
Knowledge of coding guidelines	4.11	Accepted
Coding reflects diagnosis	3.55	Accepted
Minimal coding errors	2.92	Rejected
Coding improves service delivery	4.24	Accepted
Coding affects billing	4.31	Accepted

Respondents generally understand coding guidelines and recognise the part coding plays in improving service delivery and billing. The low mean score recorded for minimal coding errors, however, points to persistent difficulty with coding accuracy in practice, and it suggests a real need for better training, closer supervision, and more consistent adherence to standardised coding procedures.

4.3.2 Objective Two: Influence of Indexing on Timely Retrieval

Table 7: Indexing Practices

Statement	Mean	Decision
Records are properly indexed	3.33	Accepted
Indexing reduces delay	4.15	Accepted
Prevents duplication / loss	3.00	Neutral
Improves workflow	3.87	Accepted
Supports decision making	3.99	Accepted

Indexing clearly plays a significant part in reducing delays, improving workflow, and supporting decisions across the hospital. The neutral response on preventing duplication and loss of records, however, points to a problem that has not been solved yet, one that may stem from limited monitoring, thin technological infrastructure, or simple inconsistency in how records are managed day to day.

4.4 Discussion of Findings

Taken together, the findings demonstrate that accurate coding and effective indexing form an essential part of efficient healthcare delivery at the Federal Medical Centre, Yenagoa. Health Information Management personnel clearly understand why these practices matter, particularly for patient care and records management, a picture consistent with Huffman (1994), who argued that accurate clinical coding properly documents patient conditions and strengthens continuity of care.

Despite this level of awareness, the study turned up notable challenges that limit how effective coding and indexing can actually be in practice. Chief among these are inadequate training, weak supervision, and broader systemic inefficiencies. These findings sit alongside those of O'Neill, Carter, and Smith (2021), who observed that insufficient training and a lack of continuing professional development contribute significantly to coding errors in healthcare institutions. Adedokun and Afolayan (2020), in their study of Nigerian hospitals, similarly reported that poor infrastructure and limited technical support hinder effective coding and indexing.

The study also found that effective indexing improves access to patient records and cuts delays in healthcare delivery, a finding that aligns with O'Malley and Harris (2022), who noted that proper indexing systems support quick retrieval of patient information and, through it, timely clinical decisions and better workflow efficiency. Smith, Nguyen, and Taylor (2023) similarly emphasised that well organised health information systems contribute significantly to reducing operational delays and strengthening coordination among healthcare providers.

The challenges affecting coding and indexing at FMC Yenagoa appear to be systemic and interconnected rather than isolated. Inadequate infrastructure, including unstable electricity and limited ICT resources, directly affects how efficiently staff can carry out coding and indexing tasks, a finding consistent with Blaya and colleagues (2019), who found that inconsistent power supply and lack of technical support significantly hinder health information system effectiveness in resource limited settings.

Staffing shortages and heavy workloads also appear to contribute to coding errors and indexing inefficiencies. Health Information Management personnel often manage large volumes of records with limited support, and this leads to fatigue, rushed work, and higher error rates, a pattern that echoes Abdulrahman and Sulaiman (2020), who reported that human resource shortages significantly reduce the efficiency of health information management systems in Nigerian hospitals.

The institutional environment at FMC Yenagoa also shapes coding and indexing practice in meaningful ways. Management support, resource availability, and institutional policy all appear to influence staff performance, and hospitals with strong leadership commitment to health information management tend to show better coding accuracy and indexing efficiency, an observation consistent with Cresswell and Sheikh (2013), who emphasised that organisational readiness and institutional culture strongly shape how successfully health information systems perform.

Despite the positive contributions coding and indexing already make, the persistence of coding errors and indexing challenges observed in this study suggests that their full benefit has not yet been realised at FMC Yenagoa. Without adequate training, proper supervision, and improved technological systems, these inefficiencies are likely to continue, a view supported by Galbraith's (1973) Information Processing Theory, which stresses that effective organisation, processing, and retrieval of information are critical to organisational efficiency.

The findings also underline the importance of continuing professional development for Health Information Management personnel. Regular training on updated coding guidelines, indexing techniques, and emerging health information technologies is essential for maintaining coding accuracy and indexing effectiveness, a conclusion consistent with Mutale and colleagues (2014), who reported that targeted training and supportive supervision improve data quality and reporting accuracy in healthcare facilities.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

This study examined coding accuracy and indexing effectiveness at the Federal Medical Centre, Yenagoa, guided by two objectives, assessing the level of accuracy in coding and indexing practices, and examining the influence of effective indexing on the timely retrieval of patients' records.

The findings show that coding and indexing practices are widely understood and applied by personnel and that they play a significant role in improving healthcare service delivery. On the first objective, respondents demonstrated good knowledge of coding and indexing guidelines, though challenges such as coding errors and inconsistent adherence to standards remain. On the second objective, indexing was found to contribute significantly to the timely retrieval of patient records and to enhance workflow, although limitations remain in fully preventing duplication and loss of records.

The study also found that the challenges facing coding and indexing at FMC Yenagoa are systemic and interrelated rather than isolated incidents. Inadequate infrastructure, including unstable electricity supply and limited ICT resources, directly affects how efficiently staff can perform coding and indexing tasks. Staffing shortages and heavy workloads contribute to coding errors and indexing inefficiencies, and the institutional environment, including management support and resource availability, plays a considerable part in shaping how well coding and indexing are carried out.

5.2 Conclusion

The study concludes that coding accuracy and indexing effectiveness are essential components of an efficient healthcare delivery system at the Federal Medical Centre. The findings show that effective coding and indexing significantly enhance patient care and support timely access to health information, playing a central role in strengthening the overall performance of the healthcare system.

Although healthcare personnel show a clear understanding of coding and indexing practice, the study found that their effectiveness is limited by systemic challenges, inadequate training and professional development, weak supervision, insufficient technological infrastructure, and inconsistent adherence to standardised procedures among them. The study further found that organisational factors, management support, resource availability, and institutional policy, exert a greater influence on the effectiveness of coding and indexing than individual competence alone.

The findings also indicate that improving coding accuracy and strengthening indexing procedures can produce real benefits, including reduced waiting time and faster retrieval of patient records. Achieving these benefits, however, requires deliberate institutional commitment to capacity building, technological upgrades, and consistent enforcement of standards.

5.3 Recommendations

Based on the findings of this study, the following recommendations are offered to improve coding and indexing practice and lift healthcare system efficiency at the Federal Medical Centre and comparable institutions.

1. Hospital management should invest in continuously upgrading health information infrastructure, including stable electricity supply, reliable internet connectivity, and modern Electronic Health Record systems. These improvements are necessary to keep coding and indexing processes running without interruption and to reduce system delays and data loss.
2. Health Information Management personnel should undergo structured, regular training programmes, ideally on a quarterly or biannual basis, covering international coding standards such as International Classification of Diseases systems, modern indexing techniques, and the effective use of digital health technologies. This will help reduce coding errors and lift overall accuracy and professionalism.
3. Hospital management should establish dedicated supervisory frameworks and functional ICT support units within the Health Information Management Department. These units should carry out routine monitoring of coding and indexing activities, provide prompt technical assistance, and enforce compliance with standard procedures to keep errors and inconsistencies to a minimum.
4. Digital health information systems used for coding and indexing should be simplified, standardised, and made genuinely user friendly. System designers and hospital ICT units should make sure interfaces are intuitive and match the skill levels of the staff using them, to encourage effective adoption and reduce operational difficulty.
5. Government should provide targeted funding mechanisms for digital health transformation in public healthcare institutions, alongside clear national policies developed and strictly enforced to standardise coding and indexing practice across hospitals, including monitoring frameworks to ensure compliance and the sustainability of digital health initiatives.

5.4 Limitations of the Study

This study carries several limitations worth bearing in mind when interpreting its findings. First, the research was conducted in a single hospital, which limits how far the results can be generalised, since healthcare practices, resources, and administrative systems vary considerably across different hospitals in Nigeria.

Second, the study relied on self reported data from respondents, which is subject to potential bias, including recall bias and social desirability bias, where participants may overstate compliance with proper coding and indexing procedures or understate the challenges they actually face.

Time and resource constraints also limited the possibility of expanding the study to include multiple hospitals or a larger sample, and a broader scope would have allowed for comparative analysis and stronger generalisation of findings across different healthcare settings.

Finally, the study deliberately focused on coding and indexing as key components of Health Information Management. While necessary to meet the study's objectives, this focus means other important factors, electronic health record system design, institutional policy, and broader information management practice among them, were not examined in depth. Despite these limitations, the study offers valuable insight into coding accuracy and indexing effectiveness within the context examined, and it provides a foundation for further research in this area.

5.5 Suggestions for Further Studies

Building on the findings and limitations of this study, several areas stand out as worth pursuing in future research to strengthen the evidence base on Health Information Management practice. First, future studies should adopt a multi hospital design involving both public and private healthcare facilities, addressing the generalisability limitation identified here. A broader comparative approach would let researchers examine how differences in hospital size, funding, staffing, and management systems shape coding and indexing practice. Second, future research should lean more heavily on objective data sources, hospital records, insurance claims, audit reports, and electronic health record extracts among them, to reduce reliance on self reported information and improve the validity and reliability of findings. Third, further studies should look more closely at digital health technologies, particularly the role of electronic health records, automated coding systems, and health information management software, examining how these technologies affect coding accuracy and indexing efficiency. Fourth, future researchers could explore the relationship between staff competence, continuing professional training, and the effectiveness of coding and indexing systems, offering deeper insight into the human resource factors that shape efficiency within Health Information Management units.

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