Research Article

Prospects and Challenges of Clinical Coding and Indexing in Tertiary Healthcare Facilities: A Case Study of Usmanu Danfodiyo University Teaching Hospital, Sokoto

*Dr. Abubakar Hamza [1], Sani Hassan Sauwa [2], Kayode Orimoloye [3]

[1,2,3] School of Health Information management, Usmanu Danfodiyo University Teaching Hospital Sokoto

Corresponding author: Dr. Abubakar Hamza

School of Health Information management, Usmanu Danfodiyo University Teaching Hospital Sokoto

Abstract

Clinical coding and indexing are critical components of modern health information management systems, ensuring accurate documentation, effective data retrieval, and evidence-based healthcare delivery. This study examined the prospects and challenges of clinical coding and indexing in tertiary healthcare facilities, focusing on Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto. A descriptive cross-sectional survey design was used, involving 108 Health Information Management (HIM) professionals. Data were collected through structured questionnaires and analyzed using descriptive statistics such as frequencies and percentages. Findings revealed that most respondents were knowledgeable about clinical coding and indexing, with 90% familiar with international coding systems such as ICD-10 and ICD-11. However, key challenges included inadequate training opportunities (71%), shortage of qualified professionals (70%), poor infrastructure, limited access to updated coding manuals, and weak institutional support. Despite these challenges, the study identified strong prospects, including improved patient data management, enhanced billing accuracy, support for evidence-based decision-making, and opportunities for professional growth. The study concludes that clinical coding and indexing have significant potential to strengthen health systems in Nigeria, provided that barriers such as inadequate staffing, insufficient funding, and poor documentation are addressed. It recommends regular refresher training, recruitment of skilled coding personnel, adoption of modern technologies, and stricter enforcement of documentation standards.

Keywords: Clinical coding, Indexing, Health Information Management, Challenges, Prospects, UDUTH Sokoto.

Introduction

Health information is the foundation of effective healthcare delivery, planning, and policy development. Clinical coding and indexing play vital roles in transforming patient data into standardized formats that facilitate clinical care, research, and hospital administration. According to the World Health Organization (WHO, 2019), the International Classification of Diseases (ICD) provides a globally accepted framework for coding diseases and procedures to ensure uniformity in health data reporting. Despite their importance, the implementation of clinical coding and indexing in many Nigerian healthcare facilities faces significant obstacles. These include a shortage of trained professionals, inadequate infrastructure, outdated software, and limited institutional commitment (Nwankwo et al., 2020). Such challenges impede accurate data capture, affect hospital reimbursement, and undermine health system performance.

There are various demands for accurately coded data. In addition to their use on claim for reimbursements, codes are also included in the data set used for the evaluation of the process and outcome of healthcare. Quality management activities, case-mix management: planning, market and other administrative purpose and research activities.

The tenth revision of the International Classification of Diseases (ICD-10) is widely used for epidemiological research and health management. The clinical modification (CM) and procedure coding system (PCS) of ICD-10 were developed to describe more clinical details with increasing diagnosis and procedure codes and applied in disease-related groups for

reimbursement. The expansion of codes made the coding time-consuming and less accurate. The state-of-the-art model using deep contextual word embeddings was used for automatic multilabel text classification of ICD-10. In addition to input discharge diagnoses (DD), the performance can be improved by appropriate preprocessing methods for the text from other document types, such as medical history, comorbidity and complication, surgical method, and special examination, (Pei-fu, C. at al 2022)

Asadi, el al (2022). Coding can be defined as a process of assigning numeric digits to represent several descriptive attributed diseases of condition or operative term. Coding is the translating of narrative descriptions of diseases, injuries and procedures into alphanumeric codes precisely the process of assigning numbers to medical and health term, International Classification of Disease — 10th revisions (ICD-10) revision.

Huffinan, (2019) Huffman, on her part defined coding as: "A procedure which assigns numeric code to diagnostic and procedural data, based on a medical classification system."

Omidoyin, (2016). Clinical coding: this is the translation of medical terminologies as written by the clinician, to describe a patient's complaint, problem, diagnosis, treatment or reason for seeking medical attention into coded format that is nationally and internationally recognized. Clinical Coding is also defined as the translation of diagnosis of disease, health related problems and procedural concepts, from text to alphabet or numeric code for easy storage, retrieval when it is needed and uniformity of comparison and analysis.

Tajudden T. et al (2021) Clinical coding and indexing is the process by which medical procedure and diagnoses are represented and displayed by universal code number. It is a system that plays a key role in modern healthcare and also allow statistical analyses of diseases and treatment, diagnoses related group, reimbursement, easier observance and tracking of epidemic and production events.

Mr. Collins (2024) prospect is from the Latin word prospectus which means a "view or outlook." A prospect is still a way of looking ahead and expecting good things. It's like potential in that it's something that might be but isn't yet. There is also the potential for something bad to happen, but prospects usually look good. In the 1800s, when men in floppy brown hats started saying "there's gold in them there hills!". The noun became a verb to prospect is to search for gold. Either way, when you have prospects, you have a golden future.

Dictionary match, (2025) Challenge as a verb is derived from a Latin word meaning "to accuse falsely" and it is still used much as it was in the 13th century in the sense of questioning whether something is true or right. Students sometimes challenge a weeknight curfew, and lawyers might challenge the evidence submitted by the other side in a lawsuit. Challenge is also used as a noun for a competition in which people challenge one another to prove that they are the best at something.

Statement of the Problem
Despite government efforts toward recruiting qualified personnel and providing tools for effective clinical coding and indexing, the desired outcomes have not been fully achieved. Tertiary healthcare facilities in Sokoto State continue to face numerous challenges that hinder the quality and accuracy of patient health records. Key issues include incomplete or poorly documented discharge summaries, illegible handwriting in medical records, inadequate motivation among coding and indexing staff, and inconsistent adherence to standard documentation practices.

These deficiencies contribute to errors in coding and indexing, which in turn compromise the accuracy of hospital data, affect clinical decision-making, and reduce the reliability of health information used for planning and research. Therefore, this study seeks to investigate the prospects and challenges of clinical coding and indexing in tertiary healthcare facilities in Sokoto State, with particular reference to the Usmanu Danfodiyo University Teaching Hospital, Sokoto.

Objectives Of the Study
The main objective of this study is to investigate the prospects and challenges of clinical coding and indexing in tertiary healthcare facilities in Sokoto State. The specific objectives are to:
1. Examine the benefits of clinical coding and indexing in healthcare facilities in Sokoto State.
2. Assess the perceptions of Health Information Management (HIM) professionals regarding clinical coding and indexing.
3. Determine the extent of ICD usage by Health Information Management professionals in the two tertiary healthcare facilities.
4. Identify the hindrances to effective clinical coding and indexing in tertiary healthcare facilities in Sokoto State.
5. Evaluate the combined influence of prospects and challenges on clinical coding and indexing.
6. Explore strategies for promoting effective clinical coding and indexing in tertiary healthcare facilities in Sokoto State.

Literature Review
Clinical Coding and Indexing

Browns (2009) defined clinical coding as a vital component of a standardized health record, which is a prerequisite for sharing records. Clinical coding ensures that medical information is accurately structured and transmitted, making it standardized and comparable worldwide.

Kouner (1990) describes clinical coding as the translation of written clinical notes about patient care into code format. For example, acute appendicitis is represented by the code "K35.9." Clinical coding applies standardized classification systems (e.g., ICD-10) across all specialties—including endocrinology, pediatrics, and oncology—to record diagnoses and procedures.

A disease and procedure classification system allows systematic recording, analysis, interpretation, and comparison of morbidity and procedural data across hospitals, states, and countries. This information supports health policy development, research, planning, and financial reimbursement.

WHO (2018) highlighted that clinical coding and indexing improve data accuracy by enabling precise capture and storage of patient data, reducing errors, and enhancing data analysis. Standardized codes facilitate identification of trends, patterns, and outcomes.

Coding

Omidoyin (2006) defines coding as the process of assigning numerical digits to represent descriptive attributes of diseases or procedures. Coding is a primary function of health information departments, directly related to interpreting medical knowledge. The WHO recommends substituting numbers for words or letters in the international classification of diseases to enable information processing.

The objectives of coding include statistical data analysis, retrieval, and reporting for research. Data can be analyzed using tools such as Microsoft Excel, Microsoft Access, or specialized statistical software. Classification and coding are interrelated; coding is impossible without a classification system. Clinical coding assigns alphanumeric codes to diagnostic statements following classification rules, covering morbidity and mortality conditions.

American Health Information Management Association (2019) defines clinical coding as the transformation of verbal descriptions of diseases, injuries, and procedures into numeric or alphanumeric designations. Initially, coding classified mortality data, but it now also covers morbidity and procedural data for clinical care, research, quality management, planning, and administration.

Bajaj, Crabtree, and Tucker (2007) emphasized that coding requires logical and mathematical knowledge, including classification, numbers, and time concepts. Coders organize facts into conceptual systems, relate codes, and make inferences about unfamiliar diseases and procedures. Coding has extended to outpatient and non-consultative clinics to capture comprehensive data.

Mogli (2001) explained that coding groups similar conditions and procedures for statistical tabulation, supporting health service planning, disease pattern classification, standardized reporting, and healthcare evaluation.

Indexing

Omidoyin (2001) describes indexing of diseases and operations as listing specific diseases or procedures on a card according to a recognized classification, including all essential patient data.

Aina (2004) defines indexing as a process that guides users to the intellectual content of a document or collection of documents. The resulting index serves as a pointer to relevant information.

Indexing is a critical function of health information officers. It compiles patient care data, providing a listing of diseases and procedures with corresponding code numbers to maintain a health information database. The index serves as a repository for research, training, and healthcare system management.

Prospects of Coding
1. Career Prospects: Coders assign codes for reimbursement, data analysis, and healthcare quality management. Roles include Data Analysts and Health Informatics Specialists.
2. Industry Prospects: Adoption of EHRs, AI, telehealth, and personalized medicine increases demand for skilled coding professionals.
3. Research Prospects: NLP and machine learning can improve automated coding; studies can assess data quality, interoperability, and HIE systems.

4. Educational Prospects: Certificates, undergraduate/graduate programs, online courses, workshops, and conferences can enhance coding skills and knowledge.

Challenges

Maryam et al. (2022) identify coding errors caused by limited coder ability, incomplete physician documentation, inconsistent terminology, and communication gaps.

Organizational Challenges: Insufficient staffing, resources, poor communication, and inconsistent practices.

Clinical Challenges: Complex cases, emerging diseases, and variable documentation.

Technological Challenges: Legacy systems, interoperability issues, and poor data quality.

Importance of Accurate Clinical Coding

Accurate clinical coding translates medical terminology into standardized codes recognized nationally and internationally. High-quality coded data supports hospital management, statistical analysis, policy planning, and decision-making (NHS, 2023). Audit and training of coders are essential to ensure accurate, reliable data.

Challenges in Coding and Indexing

Errors in coding can have far-reaching consequences. Common challenges include:

- Physician documentation errors (Surjan, 2021)
- Incomplete or illegible medical records (Anian & Ismail, 2021; Lucyk et al.)
- Ambiguous abbreviations
- Human error in code selection

Price and Robinson highlight illegible handwriting, lost records, inaccessible documentation, and tight deadlines. Coding errors include omitted diagnoses, indexing mistakes, and violations of ICD rules.

Impact of Technology on Coding and Indexing

Tajudeen et al. (2021) define coding as transforming clinical information into processable codes. Modern coding and indexing facilitate morbidity and mortality analysis, public health planning, budgeting, and research (Bronnert, 2013; Adebayo & Omole, 2019). Standardized coding enhances data collection, reporting, and international comparability. Modernization requires quality-oriented, technology-driven systems for accurate data collection, analysis, and decision-making.

THEORETICAL FRAMEWORK

This study is anchored on two complementary frameworks: the Health Information System (HIS) Performance Model and the Technology Acceptance Model (TAM). These models provide insights into operational, technological, and behavioral factors affecting clinical coding and indexing.

Health Information System (HIS) Performance Model

Developed by Lippeveld et al. (2000), the HIS Performance Model emphasizes the interdependence of human resources, infrastructure, technology, and funding. It assesses the accuracy, timeliness, completeness, and usability of health data, recognizing systemic deficiencies (e.g., inadequate training or outdated infrastructure) as potential bottlenecks.

Application to the Study:

At UDUTH Sokoto, this model evaluates how skilled coders, coding tools (ICD-10/11), technological infrastructure, and funding affect coding accuracy and efficiency. It identifies strengths, gaps, and opportunities for improvement in clinical coding practices.

Technology Acceptance Model (TAM)

Davis (1989) proposed TAM, focusing on:

- **Perceived Usefulness (PU):** Belief that technology enhances performance.
- **Perceived Ease of Use (PEOU):** Perception that technology is user-friendly.

External factors such as training, system design, and support influence adoption. In healthcare, TAM helps explain adoption of EMRs, coding software, and other digital tools.

Application to the Study:

At UDUTH Sokoto, TAM evaluates how coders' perceptions of digital platforms influence adoption and proficiency. Positive perceptions increase accuracy and efficiency; negative perceptions hinder adoption and compromise data quality. Strategies such as training, improved usability, and support can enhance technology acceptance and clinical coding outcomes.

CONCEPTUAL MODEL

The conceptual model synthesizes insights from the Health Information System (HIS) Performance Model and the Technology Acceptance Model (TAM) to create a comprehensive framework for examining the multidimensional factors influencing clinical coding and indexing in tertiary healthcare institutions. It frames clinical coding as a complex, interactive process shaped by individual, organizational, technological, and clinical determinants, all of which ultimately affect system-level outcomes. The model is structured around four interrelated dimensions:
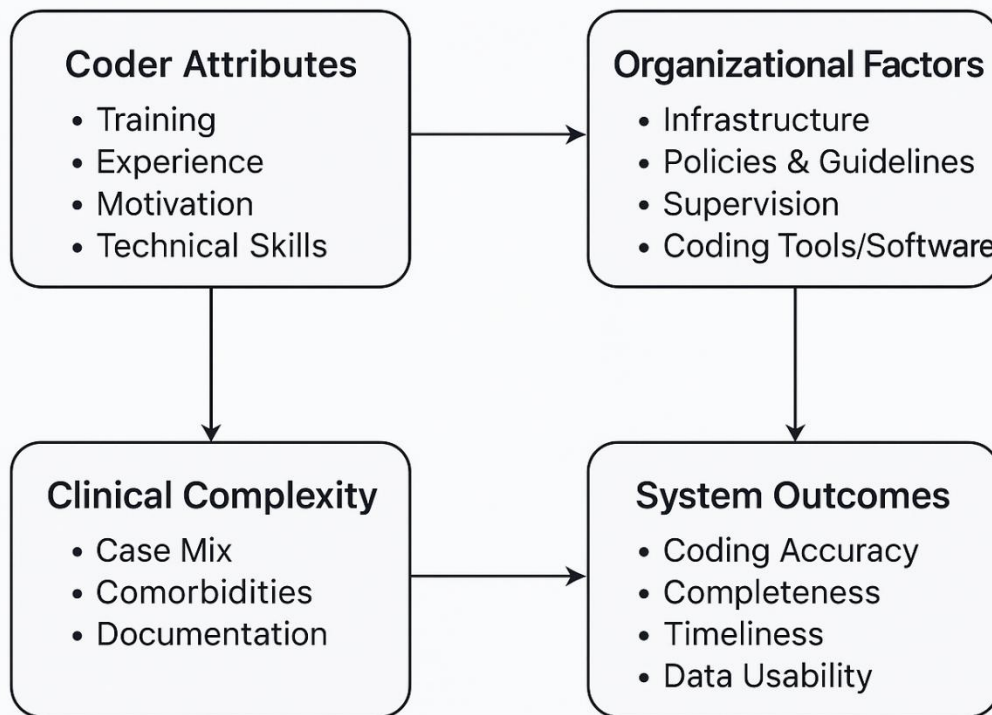
1. Coder Attributes

This dimension captures individual characteristics that directly influence coding quality and productivity. These include:

- Professional training and ICD literacy
- Work experience and technical competence
- Motivation and job satisfaction
- Technological literacy and adaptability

Coders with advanced ICD-10 skills, adequate experience, and strong motivation are more capable of producing accurate and reliable codes, particularly when dealing with complex cases. Conversely, insufficient training, poor morale, or low digital competence may result in coding errors, delays, and reduced data quality.

2. Organizational Factors

This dimension refers to institutional conditions that either enable or hinder effective clinical coding and indexing. Key elements include:

- Availability of modern IT infrastructure (computers, servers, electronic record systems)
- Coding software and standardized tools
- Adequate staffing levels and supervision
- Supportive policies, guidelines, and financial resources
- Continuous professional development opportunities

Organizations with strong infrastructure, clear documentation policies, and efficient supervisory structures tend to achieve more accurate and consistent coding outcomes. In contrast, outdated systems or weak operational support often lead to inefficiencies and poor data quality.

3. Clinical Complexity

Clinical complexity captures the nature and variability of patient cases and the quality of the documentation generated by healthcare providers. Influencing factors include:

- Diversity of case mix

- Prevalence of comorbidities or rare conditions
- Completeness and clarity of clinical documentation
- Clinician–coder communication
- Timeliness of record availability

Highly complex or poorly documented cases make it challenging for coders to assign correct codes, which can undermine the accuracy and usability of health data.

4. System Outcomes

This dimension reflects the overall performance of the health information system as influenced by the three preceding factors. Key outcomes include:

- Coding accuracy and completeness
- Timeliness of data capture
- Reliability and usability of health data for planning, research, and decision-making

High-quality outcomes support efficient resource allocation, effective disease surveillance, clinical decision-making, and hospital management. Poor outcomes, however, compromise service delivery and health system performance.

Interactions within the Model

The model illustrates the dynamic interactions among the four dimensions. For example:

- Skilled coders (coder attributes) operating in a technologically supportive environment (organizational factors) can more effectively manage complex cases (clinical complexity), ultimately producing high-quality data (system outcomes).
- Inadequate training, limited supervision, outdated IT systems, or poor clinical documentation can trigger a cascade of negative effects that compromise coding accuracy and overall HIS performance.

Thus, the model highlights that improvements in any dimension must be accompanied by supportive conditions across the others to achieve optimal outcomes.

Application to the Study Context

Within Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto, the conceptual model serves to:

- Identify how coder attributes (e.g., training gaps, ICD proficiency) influence coding performance
- Examine organizational enablers or constraints, such as infrastructure reliability, record management policies, and supervision
- Assess the complexity and quality of clinical documentation generated within the hospital
- Evaluate how these factors collectively affect coding accuracy, data completeness, and system usability

Through this lens, the model guides the identification of key challenges—including inconsistent documentation practices, unreliable IT systems, or coder skill gaps—and supports the development of targeted interventions such as capacity-building, infrastructure upgrades, and standardized documentation protocols. This provides a systematic approach for strengthening health information management and improving data quality within Nigerian tertiary healthcare settings.

2. Methodology
3.2 Research Design

The study adopted a descriptive cross-sectional survey design, which is appropriate for collecting data from a defined population at a single point in time. This design enabled the researcher to assess the current practices, perceived benefits, and challenges associated with clinical coding and indexing in the selected tertiary healthcare facilities in Sokoto State. The cross-sectional approach was suitable because it provides a snapshot of existing conditions and allows for the examination of relationships between variables without manipulating the study environment.

Population of the Study

The population for this research comprised Health Information Management (HIM) professionals working at Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto. The total number of eligible HIM professionals in the hospital is 132, and this entire group formed the target population for the study. These individuals are directly responsible for health records management, clinical coding, and indexing activities, making them relevant respondents for the research objectives.

Sample Size and Sampling Technique

Given the relatively small and manageable population size (132 HIM professionals), the study utilized a total enumeration sampling technique. Consequently, all 132 eligible professionals were included as study participants to ensure full representation and enhance the accuracy and generalizability of the findings within the hospital context.

Sampling Technique

The study specifically employed total population sampling, a subtype of purposive sampling where the entire population that meets the inclusion criteria is selected. This approach is appropriate when:

- the population size is not large,
- the target group possesses specialized knowledge or skills relevant to the study,
- comprehensive coverage is needed to avoid sampling bias.

Using total population sampling ensured that all HIM professionals involved in clinical coding and indexing at UDUTH were represented, thereby improving the reliability of the results.

3. Results

Table 1: Personal and Professional Information of Respondents

Age Group	Frequency	Percentage (%)
20–24	29	27
25–34	31	29
35–44	20	18
45–54	25	23
55 and above	3	3
Total	**108**	**100%**

Age Group	Frequency	Percentage (%)
20–24	29	27
25–34	31	29
35–44	20	18
45–54	25	23
55 and above	3	3
Total	**108**	**100%**
Area of Specialization	**Frequency**	**Percentage (%)**
HIM	108	100
Others	0	0
Total	**108**	**100%**

Source: Field Survey, 2025

Personal and Professional Information

A total of 132 questionnaires were distributed to professionals in the study area, out of which 108 were successfully retrieved, representing an 81% response rate. In terms of age distribution, the largest proportion of respondents fall within the 25–34 age bracket (29%), followed closely by those aged 20–24 (27%). Respondents aged 45–54 years constitute 23%, while 18% fall within the 35–44 age group, and only 3% are aged 55 years and above. Regarding gender, the respondents are predominantly male (55%), while females constitute 45%. This suggests a need for increased female representation during recruitment processes. With respect to educational qualifications, 40% of respondents hold a National Diploma (ND), making it the most common qualification. This is followed by Higher National Diploma (HND) holders at 30%, B.Sc. holders at 19%, and M.Sc. holders at 7%. The remaining 4% fall under "other" unspecified qualifications. Overall, ND and HND qualifications dominate the workforce, while advanced degrees such as Master's, PhD, and other qualifications remain relatively uncommon (each below 9%). All respondents (100%) are staff of the Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto, and all are professionals in Health Information Management, indicating full alignment with the focus area of the study. Analysis of work experience shows that 29% of respondents have 1–3 years of professional experience, 22% have more than 10 years, 20% have 4–6 years, 16% have 7–10 years, and 13% have less than one year of experience. The data shows that 56% of respondents have never attended any professional training, while 44% have received some form of training.

S/N	Statement	SA	A	N	D	SD	Total
1	I am familiar with the concept of clinical coding and indexing	51 (47%)	45 (42%)	4 (4%)	7 (6%)	1 (1%)	108 (100%)
2	I have received formal training in clinical coding and indexing	45 (42%)	52 (48%)	3 (3%)	6 (5%)	2 (2%)	108 (100%)
3	I am familiar with international coding systems (e.g., ICD-10, ICD-11)	28 (26%)	53 (49%)	19 (18%)	8 (7%)	0 (0%)	108 (100%)
4	Clinical coding and indexing are part of my routine responsibilities	33 (31%)	57 (53%)	8 (7%)	9 (8%)	1 (1%)	108 (100%)

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5	I have adequate knowledge to perform clinical coding without supervision	20 (18%)	48 (44%)	19 (18%)	19 (18%)	2 (2%)	108 (100%)
6	I regularly use coding manuals or software in my work	24 (22%)	57 (53%)	13 (12%)	10 (9%)	4 (4%)	108 (100%)
7	My hospital provides adequate resources (manuals, software, internet) to support coding and indexing	32 (30%)	48 (44%)	8 (7%)	19 (18%)	1 (1%)	108 (100%)
8	I believe knowledge of statistics is important for accurate coding and indexing	42 (39%)	50 (46%)	9 (8%)	4 (4%)	3 (3%)	108 (100%)
9	I feel confident in applying statistical knowledge to improve coding accuracy	41 (38%)	49 (45%)	9 (8%)	7 (6%)	2 (2%)	108 (100%)
10	I require further training and professional development in coding and indexing	35 (32%)	60 (56%)	7 (6%)	5 (5%)	1 (1%)	108 (100%)

Interpretation

This section examines the current practices in clinical coding and indexing among Health Information Management professionals. Findings show a generally high level of awareness, training, and engagement in coding-related responsibilities. Regarding familiarity with the concept of clinical coding and indexing, a total of 89% of the respondents (47% strongly agree; 42% agree) affirm that they understand the concept. Only 7% disagree, while 4% remain neutral, indicating a strong foundational awareness of coding practices. Similarly, when asked whether they have received formal training on clinical coding and indexing, 90% (42% strongly agree; 48% agree) confirm having undergone such training. Only a small proportion (5% disagree; 2% strongly disagree) indicate otherwise, demonstrating that training in clinical coding is widespread among the professionals. Lastly, a vast majority of respondents (88%, made up of 32% strongly agree and 56% agree) state that they require further training and professional development in clinical coding and indexing. Only 6% disagree. This highlights a strong demand for continuous learning and capacity building in the field.

Discussion of findings

The findings highlight that clinical coding and indexing are widely recognized among HIM professionals as essential to improving hospital performance and patient data management. However, the study revealed significant systemic and operational barriers similar to those reported by Olaniyan et al. (2019) and Adegoke & Afolabi (2017), who identified training deficits, lack of standardization, and poor technology adoption as major issues in Nigerian health institutions.

Limited awareness among clinicians about the importance of accurate documentation also contributes to errors and delays in coding. These findings align with Maryam et al. (2022), who reported that incomplete and illegible records significantly reduce coding accuracy.

Nevertheless, prospects remain high. Adoption of ICD-11, investment in modern electronic health record systems, and continuous professional development programs can drastically improve coding quality and hospital data integrity. Furthermore, enhancing motivation through recognition, career advancement, and fair remuneration can increase coder efficiency and retention.

SUMMARY

This study examined the prospects and challenges of clinical coding and indexing in a tertiary healthcare facility, using Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto, as a case study. The primary aim was to assess the level of knowledge, current practices, and challenges encountered by Health Information Management (HIM) professionals in performing accurate clinical coding and indexing of medical records. The study also sought to identify opportunities for improvement and future development within the system. Accurate and standardized coding is essential for ensuring uniform representation of diseases, procedures, and healthcare interventions across various levels of the health system. Despite its importance, many healthcare facilities in Nigeria continue to face obstacles such as inadequate infrastructure, insufficiently trained personnel, and limited funding, all of which hinder the smooth adoption and implementation of advanced classification systems such as ICD-10 and the newer ICD-11.

Findings from the study indicate that most HIM professionals at UDUTH are familiar with the principles of clinical coding and indexing and have received some form of training—either formal or informal—in the use of the International Classification of Diseases (ICD). However, several operational, technical, and institutional challenges were identified as major barriers to full implementation and optimal efficiency of the coding and indexing process. Overall, the research reveals that although clinical coding and indexing are widely recognized as crucial components of effective health information management, their success depends heavily on sustained institutional commitment, adequate funding, clear policy guidelines, and continuous professional development.

CONCLUSION

The findings of this study affirm that clinical coding and indexing are fundamental to the development of a modern, efficient, and data-driven healthcare information system. These processes are central to supporting informed decision-making, enhancing the quality of healthcare delivery, enabling effective epidemiological surveillance, and ensuring accurate hospital revenue management through standardized classification of diagnoses and procedures. At Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto, HIM professionals demonstrated a reasonable level of understanding of clinical coding and indexing principles. However, the practical application of this knowledge remains constrained by structural and institutional limitations.

The study concludes that the challenges affecting effective clinical coding and indexing are multi-dimensional. They include technical issues, financial shortages, human resource constraints, managerial gaps, and inadequate policy frameworks. Key among these challenges are the sustained reliance on manual systems, insufficient IT support, poor infrastructure, and the absence of a fully integrated Electronic Health Record (EHR) platform. In conclusion, the study emphasizes that the future of health information management in Nigeria depends on strategic investments in digital transformation, improved infrastructure, and consistent capacity building. When these measures are effectively implemented, clinical coding and indexing can evolve from routine administrative activities into powerful tools for national health planning, policy development, and quality healthcare delivery.

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