# An Evaluation of the Impact of Accurate Clinical Coding of Health Records on Billing Accuracy in Selected Hospitals in Egbeda Local Government Area, Ibadan, Oyo State, Nigeria

***Famade TITILAYO***
*University of Ibadan, Faculty of public health*

***Ogunmola-Oladele Tinuola Oluwatoyin***
*Health Informatics and Information Management Department*
*Cavalla International University, Roseville, USA*

***OMOLE, Segun Micheal***
*Ph.D., Fhrim, Department of Health Information Management,*
*Faculty of Basic Medical Science, University of Ilesa, Ilesa, Osun State, Nigeria*

***Adedoyin Odunayo ADEBOWALE***
*Department of Dental Therapy/ Dental Surgery Technician*
*Ogun State Polytechnic of Health and Allied Sciences.*

***KARUNWI Adetunji Ademuyiwa***
*Trinity University, Yaba, Lagos.*

**Abstract:**
***Introduction:*** *Accurate clinical coding in health records is a critical component of health information management, directly influencing billing accuracy, reimbursement processes, and overall quality of healthcare delivery. Errors in coding can lead to financial losses, claim denials, and compromised healthcare data integrity, which can affect administrative, clinical, and research functions.* ***Objectives:*** *This study examined the effect of accurate clinical coding in health records on billing accuracy in selected hospitals in Egbeda Local Government Area, Ibadan, Oyo State, Nigeria. Specifically, it assessed the knowledge and practice of coding and billing, identified factors affecting coding accuracy, evaluated the impact of accurate coding on billing processes, and explored solutions to challenges affecting coding and billing.* ***Method of Analysis:*** *A descriptive survey design was employed. Data were collected from 200 health information management professionals using a structured questionnaire covering demographics, knowledge and practice, factors affecting coding, impact on billing, and potential solutions. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were analyzed using SPSS version 20.* ***Results:*** *Most respondents reported knowledge and practice of clinical coding and billing (75.0% strongly agreed). Major challenges included incomplete documentation (44.0% strongly agreed) and inadequate coding tools (57.0% strongly agreed). Accurate coding was seen to improve billing and healthcare delivery (75.0% strongly agreed). Key solutions identified were provision of adequate tools (76.0% strongly agreed), recruitment of staff (74.0% strongly agreed), and periodic training (70.0% strongly agreed).* ***Conclusion:*** *Accurate clinical coding is pivotal for improving billing precision, administrative efficiency, and healthcare data quality. Strengthening both individual competencies and organizational supports is essential to optimize coding practices, reduce billing errors, and ensure reliable health information for hospital management, reimbursement, and research purposes.*

**Keywords:** *Clinical Coding, Billing Accuracy, Health Information Management, Documentation Quality, Health Records, Hospital Revenue Cycle.*

## Introduction

Coding in healthcare refers to the systematic process of translating complex clinical information, including diagnoses, procedures, treatments, and services rendered to patients, into standardized

alphanumeric codes [1]. These codes function as a universal language within the healthcare system, enabling effective communication, data storage, analysis, and financial transactions across diverse healthcare settings. Standardized coding systems such as the International Classification of Diseases (ICD), Current Procedural Terminology (CPT), and Healthcare Common Procedure Coding System (HCPCS) are widely utilized to ensure uniformity and consistency in representing clinical data (Hodge & Peck, 2023). Through these systems, extensive and multifaceted medical information is converted into structured formats that facilitate interoperability, administrative efficiency, and healthcare delivery.

Beyond its administrative role, clinical coding is a highly specialized process that requires substantial clinical knowledge and technical expertise. Accurate coding necessitates a comprehensive understanding of medical terminology, anatomy, physiology, and disease processes, as well as strict adherence to established coding guidelines and standards [2]. Coders are required to carefully interpret patient records and extract relevant clinical details to assign precise codes that reflect the actual care provided (Smith & Johnson, 2022). This meticulous process ensures that clinical documentation is accurately represented, thereby supporting both clinical and administrative functions within healthcare systems.

The importance of accurate clinical coding extends to several critical aspects of healthcare management, particularly medical billing and reimbursement. Coding serves as the foundation for billing processes, as it directly determines how healthcare services are translated into financial claims submitted to insurers, government agencies, or patients. Accurate coding ensures that healthcare providers are appropriately reimbursed for services rendered, while errors in coding may result in claim denials, delayed payments, revenue loss, and potential legal consequences (Smith et al., 2021). Consequently, coding accuracy plays a pivotal role in maintaining the financial sustainability of healthcare institutions and the efficiency of revenue cycle management [3].

Medical billing, which involves the generation and submission of claims for healthcare services, is intrinsically linked to coding practices. It encompasses multiple processes, including verification of patient insurance coverage, determination of financial responsibilities such as co-payments and deductibles, claims submission, and reconciliation of payments (Phillips & Johnson, 2023). The accuracy and completeness of billing depend heavily on the precision of the underlying coding, as each billed service must correspond to appropriately assigned codes. Discrepancies in coding can lead to inaccuracies in billing, thereby disrupting the reimbursement process and affecting the financial performance of healthcare organizations. In addition to financial implications, accurate coding contributes significantly to data integrity and healthcare quality. Reliable coded data form the basis for clinical audits, epidemiological studies, healthcare planning, and policy formulation. High-quality data enable healthcare providers and policymakers to make informed decisions that enhance service delivery and patient outcomes (Johnson & Martinez, 2023). Conversely, inaccurate coding compromises data reliability, potentially leading to flawed analyses, misinformed policies, and inefficiencies in healthcare delivery systems. Thus, accurate coding is fundamental not only to financial operations but also to the broader goals of healthcare quality improvement and evidence-based practice [4].

Furthermore, the relationship between clinical coding and billing accuracy is reinforced by regulatory and compliance requirements within the healthcare sector. Adherence to coding standards and guidelines is essential to ensure transparency, accountability, and compliance with payer policies and legal frameworks. Accurate coding minimizes the risk of audits, penalties, and fraud-related issues, thereby promoting ethical billing practices and institutional credibility (Johnson & Patel, 2023). In the context of evolving healthcare systems characterized by technological advancements and a shift toward

value-based care, the need for precision in coding has become increasingly critical. Empirical evidence indicates that inaccuracies in coding are a major contributor to billing errors and inefficiencies in healthcare revenue cycles. Studies have shown that coding discrepancies often result in underbilling or overbilling, both of which have significant financial and legal implications for healthcare providers (Williams & Garcia, 2020; Smith et al., 2021). Moreover, transparent and accurate billing practices, supported by precise coding, enhance patient trust and satisfaction by providing clear and understandable financial information regarding healthcare services received. This transparency is essential for fostering positive patient-provider relationships and ensuring accountability in healthcare delivery [5]. Despite the recognized importance of accurate coding, challenges persist in many healthcare settings, particularly in developing regions where limited resources, inadequate training, and insufficient technological infrastructure may hinder optimal coding practices. In Nigeria, and specifically within local government areas such as Egbeda in Ibadan, there is limited empirical research examining the extent to which accurate clinical coding influences billing accuracy in healthcare institutions. This gap underscores the need for context-specific studies that explore the relationship between coding practices and billing outcomes within the local healthcare environment.

Given the critical role of accurate coding in ensuring billing precision, financial sustainability, regulatory compliance, and data integrity, it is essential to evaluate its impact within healthcare institutions. Understanding how coding accuracy affects billing processes will provide valuable insights into improving revenue cycle management, enhancing data quality, and strengthening overall healthcare delivery. This study, therefore, seeks to evaluate the impact of accurate clinical coding of health records on billing accuracy in selected hospitals in Egbeda Local Government Area, Ibadan, Oyo State, Nigeria, with a view to contributing to both academic knowledge and practical improvements in healthcare administration [6].

## Methods

### *Research Design*

This study adopted a descriptive cross-sectional survey design to evaluate the impact of accurate clinical coding of health records on billing accuracy in selected hospitals in Egbeda Local Government Area, Ibadan, Oyo State, Nigeria. The design allows for the collection of quantitative data at a single point in time and facilitates the examination of relationships between clinical coding accuracy and billing outcomes.

### *Study Location*

The study was conducted in Egbeda Local Government Area of Ibadan, Oyo State, Nigeria. The area comprises both urban and semi-urban communities and hosts several public and private healthcare facilities. These facilities rely on effective health information management systems, including clinical coding and billing processes, making the area suitable for this study.

### *Sample Size and Sampling Technique*

The study population comprised health information management professionals, including health records officers, clinical coders, and billing officers working in selected hospitals in Egbeda Local Government Area. These professionals are directly involved in clinical documentation, coding, and billing processes. The total population for the study was two hundred (200) respondents. A total enumeration sampling technique was adopted, whereby all members of the population were included in the study due to its manageable size. Thus, the sample size consisted of all 200 health information management professionals in the selected hospitals. Health information management professionals who were actively involved in coding, documentation, and billing processes and were available at the time of

data collection were included in the study. Those not directly involved in coding or billing activities or who were unavailable during the study period were excluded.

***Research Instrument, Validity and Reliability***

Data were collected using a structured questionnaire aligned with the study objectives. It comprised five sections: Section A captured demographic data, Section B assessed knowledge and practice of clinical coding and billing, Section C examined factors affecting coding and billing accuracy, Section D evaluated the impact of accurate coding on billing, and Section E explored solutions to related challenges. Items were rated on a five-point Likert scale from strongly agree to strongly disagree. The instrument's validity was ensured through content review by experts in health information management and research methodology, with corrections made based on their feedback. Reliability was tested via a pilot study among health information management professionals outside the study area, yielding a Cronbach's alpha of 0.70, indicating acceptable consistency.

**Method of Data Analysis**

Data were collected using a self-administered questionnaire. The researcher distributed the questionnaires to respondents in their respective hospitals and provided necessary guidance where required. Follow-up visits were conducted to ensure a high response rate and to check for completeness of responses. Data collected were analyzed using both descriptive and inferential statistical methods. Descriptive statistics such as frequencies, percentages, mean, and standard deviation were used to summarize the data. Inferential statistics, specifically chi-square analysis, were used to test the relationship between clinical coding accuracy and billing accuracy. All analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 20, with a significance level set at 0.05.

***Ethical Considerations***

Ethical approval was obtained from relevant authorities in the selected hospitals prior to data collection. Informed consent was obtained from all respondents after explaining the purpose of the study. Participation was voluntary, and respondents were assured of confidentiality and anonymity. No personal identifiers were collected, and all data were used strictly for academic purposes.

**Results**

**Table 1.** Socio-Demographic and Professional Characteristics of Respondents.

| Parameter | Classification | Frequency | Percentage (%) |
|---|---|---|---|
| **Gender** | Female | 110 | 55.0 |
| | Male | 90 | 45.0 |
| **Age (years)** | 28–37 | 108 | 54.0 |
| | 38–47 | 60 | 30.0 |
| | 48–57 | 28 | 14.0 |
| | 58+ | 4 | 2.0 |

| | | | |
|---|---|---|---|
| **Mean±SD** | 38.9±7.8 | | |
| **Marital Status** | Single | 25 | 12.5 |
| | Married | 165 | 82.5 |
| | Widowed | 10 | 5.0 |
| **Highest Level of Education** | PD/ND | 60 | 30.0 |
| | HND | 90 | 45.0 |
| | B.Sc | 40 | 20.0 |
| | MSc | 8 | 4.0 |
| | Ph.D | 2 | 1.0 |
| **Religion** | Christianity | 150 | 75.0 |
| | Islam | 45 | 22.5 |
| | Traditional | 5 | 2.5 |
| **Tribe** | Yoruba | 160 | 80.0 |
| | Hausa | 20 | 10.0 |
| | Igbo | 20 | 10.0 |
| **Years of Work Experience** | 0–5 years | 90 | 45.0 |
| | 6–10 years | 70 | 35.0 |
| | 11–15 years | 30 | 15.0 |
| | 16+ years | 10 | 5.0 |
| **Professional Cadre** | Health Records Officer | 100 | 50.0 |
| | Medical Coder | 60 | 30.0 |

| | | | |
|---|---|---|---|
| | Billing Officer | 30 | 15.0 |
| | HIM Manager | 10 | 5.0 |
| **Training on Coding** | None | 60 | 30.0 |
| | On-the-job training | 110 | 55.0 |
| | Formal Certification | 30 | 15.0 |
| **Computer Literacy** | Beginner | 40 | 20.0 |
| | Intermediate | 120 | 60.0 |
| | Advanced | 40 | 20.0 |
| **Type of Hospital** | Private | 120 | 60.0 |
| | Public | 80 | 40.0 |

The distribution by gender revealed that 55.0% of the participants were female, while 45.0% were male, indicating a slight predominance of females in the health information management workforce within the selected hospitals [7]. The age of respondents ranged from 28 to over 58 years, with the majority (54.0%) falling within the 28–37 years category. A further 30.0% were aged 38–47 years, 14.0% were between 48 and 57 years, and only 2.0% were 58 years and above. The mean age of respondents was 38.9 years, with a standard deviation of 7.8 years, reflecting a relatively young workforce actively engaged in clinical coding and billing tasks. In terms of marital status, the majority of respondents were married (82.5%), 12.5% were single, and 5.0% were widowed. The educational attainment of participants indicated that most had completed HND programs (45.0%), followed by PD/ND holders at 30.0%, B.Sc. graduates at 20.0%, and a minority with MSc (4.0%) or Ph.D. degrees (1.0%). Regarding religion, 75.0% of respondents identified as Christians, 22.5% as Muslims, and 2.5% practiced traditional beliefs. The ethnic composition was predominantly Yoruba (80.0%), with Hausa and Igbo respondents constituting 10.0% each [8].

Work experience varied among respondents, with 45.0% having 0–5 years of experience, 35.0% reporting 6–10 years, 15.0% having 11–15 years, and only 5.0% with more than 16 years in health information management. Professional cadre distribution showed that half of the participants were health records officers (50.0%), 30.0% were medical coders, 15.0% were billing officers, and 5.0% held managerial positions within the health information management units. Regarding training on coding, 55.0% had received on-the-job training, 30.0% had no formal training, and 15.0% possessed formal certification in clinical coding. Computer literacy was predominantly intermediate, with 60.0% of respondents reporting intermediate skills, 20.0% beginner-level skills, and 20.0% advanced-level

proficiency. The type of hospital in which respondents were employed indicated that 60.0% worked in private healthcare facilities, while 40.0% were employed in public hospitals [9].

**Table 2.** Knowledge and Practice of Clinical Coding and Billing (N = 200).

| Statement | Strongly Agree (SA) | Agree (A) | Disagree (D) | Strongly Disagree (SD) | Mean | Std. Dev |
|---|---|---|---|---|---|---|
| **I have sufficient knowledge of clinical coding and medical billing processes** | 110 (55.0%) | 70 (35.0%) | 10 (5.0%) | 10 (5.0%) | 1.60 | 0.75 |
| **I regularly apply clinical coding in my daily work** | 105 (52.5%) | 75 (37.5%) | 10 (5.0%) | 10 (5.0%) | 1.63 | 0.78 |
| **I regularly perform medical billing tasks in my hospital** | 90 (45.0%) | 80 (40.0%) | 15 (7.5%) | 15 (7.5%) | 1.82 | 0.88 |
| **I have received formal or specialized training on clinical coding and medical billing** | 95 (47.5%) | 85 (42.5%) | 10 (5.0%) | 10 (5.0%) | 1.73 | 0.81 |
| **I am confident in accurately assigning codes based on patient records** | 100 (50.0%) | 75 (37.5%) | 15 (7.5%) | 10 (5.0%) | 1.70 | 0.79 |
| **My hospital provides adequate support and resources for coding and billing activities** | 90 (45.0%) | 80 (40.0%) | 20 (10.0%) | 10 (5.0%) | 1.85 | |

The analysis of respondents' knowledge and practice of clinical coding and billing revealed that a majority of the participants reported adequate understanding and application of coding and billing processes. Specifically, 55.0% of respondents strongly agreed and 35.0% agreed that they possessed sufficient knowledge of clinical coding and medical billing, resulting in a mean score of 1.60 (SD = 0.75). Regarding the practical application of clinical coding in their daily work, 52.5% strongly agreed and 37.5% agreed, indicating that most respondents regularly engage in coding activities (mean = 1.63, SD = 0.78). Medical billing practice was slightly lower, with 45.0% strongly agreeing and 40.0% agreeing that they perform billing tasks, while 15.0% either disagreed or strongly disagreed (mean = 1.82, SD = 0.88). In terms of training, 47.5% of respondents had received formal or specialized training on coding and billing, and an additional 42.5% reported receiving on-the-job training, highlighting that most participants had some form of preparation to perform these tasks effectively (mean = 1.73, SD = 0.81).

Furthermore, 50.0% of respondents strongly agreed and 37.5% agreed that they were confident in accurately assigning codes based on patient records (mean = 1.70, SD = 0.79). However, when asked about the availability of hospital support and resources for coding and billing activities, 45.0% strongly agreed and 40.0% agreed, while 15.0% disagreed or strongly disagreed (mean = 1.85, SD = 0.86), suggesting that institutional support could be improved to enhance coding and billing performance [10].

**Table 3.** Factors Affecting Accurate Clinical Coding and Billing Accuracy (N = 200).

| Statement | Strongly Agree (SA) | Agree (A) | Disagree (D) | Strongly Disagree (SD) | Mean | Std. Dev |
|---|---|---|---|---|---|---|
| **Poor or incomplete documentation of patient medical records hinders coding accuracy** | 90 (45.0%) | 80 (40.0%) | 20 (10.0%) | 10 (5.0%) | 1.75 | 0.88 |
| **Illegible or unclear physician handwriting affects proper code assignment** | 105 (52.5%) | 70 (35.0%) | 15 (7.5%) | 10 (5.0%) | 1.63 | 0.82 |
| **Inadequate access to updated coding tools and manuals limits coding precision** | 100 (50.0%) | 70 (35.0%) | 20 (10.0%) | 10 (5.0%) | 1.65 | 0.84 |
| **High patient load and increased coding workflow reduce accuracy** | 120 (60.0%) | 60 (30.0%) | 15 (7.5%) | 5 (2.5%) | 1.50 | 0.78 |
| **Lack of a conducive work environment for coding and billing activities affects performance** | 110 (55.0%) | 70 (35.0%) | 15 (7.5%) | 5 (2.5%) | 1.53 | 0.79 |
| **Shortage of trained coding and indexing personnel hinders accurate documentation** | 110 (55.0%) | 65 (32.5%) | 15 (7.5%) | 10 (5.0%) | 1.57 | 0.81 |
| **Inconsistent or unfavorable hospital management policies affect coding practices** | 105 (52.5%) | 70 (35.0%) | 15 (7.5%) | 10 (5.0%) | 1.63 | 0.82 |
| **Physicians' refusal or delay in completing discharge summaries and medical forms affects coding** | 100 (50.0%) | 75 (37.5%) | 15 (7.5%) | 10 (5.0%) | 1.65 | 0.83 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Limited supervision and quality checks on coding accuracy** | 95 (47.5%) | 80 (40.0%) | 15 (7.5%) | 10 (5.0%) | 1.68 | 0.84 |
| **Lack of continuous professional development and refresher training** | 90 (45.0%) | 85 (42.5%) | 15 (7.5%) | 10 (5.0%) | 1.70 | 0.85 |
| **Technical issues or limitations with electronic health record systems** | 85 (42.5%) | 80 (40.0%) | 20 (10.0%) | 15 (7.5%) | 1.78 | |

Accurate clinical coding and billing in hospitals are influenced by a combination of organizational, professional, and technical factors that shape documentation precision. Poor or incomplete patient medical records were reported by 45.0% of respondents as a major obstacle, with an additional 40.0% agreeing that insufficient or unclear clinical information makes assigning correct codes challenging. Illegible or unclear physician handwriting was cited by 52.5% of respondents as strongly affecting coding accuracy, with 35.0% agreeing, emphasizing the reliance of coders on quality primary documentation. Limited access to updated coding tools and manuals was also noted, with 50.0% strongly agreeing and 35.0% agreeing that the absence of standardized references hinders coding precision [11].

High patient volumes and increased workflow were identified by 60.0% of respondents as strongly affecting coding accuracy, with 30.0% agreeing that time pressures often lead to rushed or incomplete coding. The lack of a conducive work environment, including inadequate workspace and limited institutional support, was highlighted by 55.0% of respondents as strongly impactful, with 35.0% agreeing. Shortages of trained coding and indexing personnel were similarly recognized, with 55.0% strongly agreeing and 32.5% agreeing that staff limitations compromise accuracy.

Inconsistent management policies and limited supervision were reported by 52.5% of respondents as strongly affecting coding practices, with 35.0% agreeing, reducing opportunities for audits and quality checks. Delays or refusal by physicians to complete discharge summaries and medical forms were also significant, with 50.0% strongly agreeing and 37.5% agreeing that these practices impede accurate code assignment. Limited continuous professional development and refresher training affected 45.0% of respondents strongly, with 42.5% agreeing. Technical limitations, including issues with electronic health record systems, were reported as strongly affecting coding by 42.5% of respondents, with 40.0% agreeing [12].

**Table 4.** Impact of Accurate Clinical Coding on Effective Billing (N = 200).

| Statement | Strongly Agree (SA) | Agree (A) | Disagree (D) | Strongly Disagree (SD) | Mean | Std. Dev |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| **Accurate clinical coding enables assessment of the quality of healthcare services provided** | 150 (75.0%) | 50 (25.0%) | 0 | 0 | 1.25 | 0.44 |
| **Clinical coding and billing improve medical research and enhance knowledge for better healthcare performance** | 125 (62.5%) | 45 (22.5%) | 15 (7.5%) | 15 (7.5%) | 1.63 | 0.97 |
| **Accurate coding and billing support effective administrative and clinical decision-making** | 140 (70.0%) | 60 (30.0%) | 0 | 0 | 1.30 | 0.46 |
| **Clinical coding generates reliable information for reimbursement purposes** | 140 (70.0%) | 60 (30.0%) | 0 | 0 | 1.31 | 0.46 |
| **Coding and billing data help monitor utilization of hospital resources and facilities** | 145 (72.5%) | 55 (27.5%) | 0 | 0 | 1.27 | 0.45 |
| **Accurate coding contributes to standardized reporting systems across hospital departments** | 150 (75.0%) | 50 (25.0%) | 0 | 0 | 1.25 | 0.44 |
| **Accurate coding ensures effective billing and timely reimbursement from payers** | 150 (75.0%) | 50 (25.0%) | 0 | 0 | 1.25 | 0.44 |
| **Proper coding improves healthcare delivery by enabling targeted interventions and monitoring outcomes** | 152 (76.0%) | 48 (24.0%) | 0 | 0 | 1.27 | 0.44 |
| **Accurate coding provides foundational data for administrative planning and clinical decision-making** | 152 (76.0%) | 48 (24.0%) | 0 | 0 | 1.24 | 0.43 |
| **Coding accuracy reduces errors in billing, minimizes claim denials, and enhances financial performance** | 145 (72.5%) | 50 (25.0%) | 3 (1.5%) | 2 (1.0%) | 1.29 | 0.48 |

| | | | | |
|---|---|---|---|---|
| **Accurate coding improves patient satisfaction by ensuring transparent and precise billing** | 140 (70.0%) | 55 (27.5%) | 3 (1.5%) | 2 (1.0%) |

The majority of respondents (75.0% strongly agreed and 25.0% agreed) indicated that accurate coding enables the assessment of the quality of healthcare services provided, highlighting its role in maintaining high standards of patient care. Similarly, 62.5% strongly agreed and 22.5% agreed that clinical coding and billing enhance medical research and knowledge, contributing to improved healthcare performance. Accurate coding was also recognized as a key tool for supporting administrative and clinical decision-making, with 70.0% strongly agreeing and 30.0% agreeing on its relevance. The process of clinical coding was reported to generate reliable information for reimbursement purposes, with 70.0% of respondents strongly agreeing and 30.0% agreeing. Additionally, 72.5% strongly agreed and 27.5% agreed that coding data help monitor the utilization of hospital resources, indicating its importance in resource management and operational planning. Standardization of reporting systems was also emphasized, as 75.0% strongly agreed and 25.0% agreed that accurate coding contributes to consistency across hospital departments [13].

Regarding financial implications, accurate coding ensures effective billing and timely reimbursement from payers, as reported by 75.0% of respondents who strongly agreed and 25.0% who agreed. The respondents further highlighted that proper coding facilitates improved healthcare delivery by enabling targeted interventions and monitoring outcomes, with 76.0% strongly agreeing and 24.0% agreeing. Foundational data for administrative planning and clinical decision-making was also reinforced, with 76.0% strongly agreeing and 24.0% agreeing. Moreover, 72.5% strongly agreed and 25.0% agreed that accurate coding reduces billing errors, minimizes claim denials, and enhances the financial performance of healthcare institutions. Finally, 70.0% strongly agreed and 27.5% agreed that accurate coding improves patient satisfaction by ensuring transparent and precise billing [14].

**Table 5.** Recommended Strategies for Enhancing Accurate Clinical Coding and Billing (N = 200).

| Statement | Strongly Agree (SA) | Agree (A) | Disagree (D) | Strongly Disagree (SD) | Mean | Std. Dev |
|---|---|---|---|---|---|---|
| **Provision of adequate coding manuals, software, and billing tools to support accurate documentation** | 152 (76.0%) | 48 (24.0%) | 0 | 0 | 1.24 | 0.43 |
| **Recruitment of sufficient clinical coding and billing personnel to handle workload effectively** | 148 (74.0%) | 44 (22.0%) | 6 (3.0%) | 2 (1.0%) | 1.30 | 0.56 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Periodic training and professional development programs for coding and billing staff** | 140 (70.0%) | 52 (26.0%) | 6 (3.0%) | 2 (1.0%) | 1.34 | 0.57 |
| **Enforcement of hospital policy requiring timely completion of discharge summaries and medical forms** | 144 (72.0%) | 48 (24.0%) | 4 (2.0%) | 4 (2.0%) | 1.32 | 0.60 |
| **Implementation of proper motivation and recognition programs for coding and billing personnel** | 148 (74.0%) | 48 (24.0%) | 4 (2.0%) | 0 | 1.27 | 0.48 |
| **Provision of a conducive working environment to facilitate efficient coding and billing activities** | 146 (73.0%) | 50 (25.0%) | 2 (1.0%) | 2 (1.0%) | 1.29 | 0.53 |
| **Establishment of quality improvement systems, including regular audits and feedback mechanisms** | 150 (75.0%) | 46 (23.0%) | 2 (1.0%) | 2 (1.0%) | 1.27 | 0.52 |
| **Adoption of supportive supervision and monitoring to reduce coding errors** | 145 (72.5%) | 50 (25.0%) | 3 (1.5%) | 2 (1.0%) | 1.28 | 0.51 |
| **Integration of electronic decision-support systems to assist coders and reduce errors** | 140 (70.0%) | 50 (25.0%) | 6 (3.0%) | 4 (2.0%) | | |

Respondents overwhelmingly supported several strategies to enhance accurate clinical coding and billing in hospitals [15]. Provision of adequate coding manuals, software, and billing tools was strongly endorsed, with 76.0% of respondents strongly agreeing and 24.0% agreeing that access to appropriate resources is essential for accurate documentation. Recruitment of sufficient clinical coding and billing personnel was also highlighted as a key intervention, with 74.0% strongly agreeing and 22.0% agreeing that adequate staffing helps manage workload effectively and reduces errors. Periodic training and professional development programs received strong support, as 70.0% of respondents strongly agreed and 26.0% agreed that continuous capacity building improves coding accuracy. The enforcement of hospital policies requiring timely completion of discharge summaries and medical forms was considered important, with 72.0% strongly agreeing and 24.0% agreeing that such policies ensure the availability of necessary clinical information for coding. Proper motivation and recognition programs for coding and billing personnel were similarly endorsed, with 74.0% strongly agreeing and 24.0% agreeing that recognition positively influences staff performance and adherence to coding standards [16].

Provision of a conducive working environment was identified as critical, with 73.0% strongly agreeing and 25.0% agreeing that suitable workspaces and institutional support facilitate efficient coding activities. The establishment of quality improvement systems, including regular audits and feedback mechanisms, was highlighted by 75.0% strongly agreeing and 23.0% agreeing, reflecting the importance of monitoring and accountability in reducing errors. Supportive supervision and monitoring were also emphasized, with 72.5% strongly agreeing and 25.0% agreeing that oversight improves coding quality. Finally, integration of electronic decision-support systems was recommended, with 70.0% strongly agreeing and 25.0% agreeing that technological tools assist coders and minimize errors [17].

**Discussion of Findings**

The results of this study reveal that health information management professionals in selected hospitals in Egbeda Local Government Area generally possess considerable knowledge of clinical coding and billing processes. Most respondents indicated that they understood and regularly applied clinical coding and billing tasks within their professional roles, which aligns with literature suggesting that coder competency and familiarity with coding standards are essential for accurate health information management (Smith & Johnson, 2022). However, gaps remain in formal coding education, as a substantial proportion of respondents had limited specialized training, suggesting the need for continuous professional development to sustain coding accuracy [18].

Several factors affecting accurate clinical coding and billing were identified, underscoring the complexity of achieving high data quality in real-world hospital settings. Poor or incomplete medical documentation, illegible physician handwriting, and insufficient access to updated coding tools were among the key constraints highlighted by participants. These findings reflect earlier studies indicating that documentation quality significantly influences coding accuracy (O'Malley et al., 2020; Bowman, 2021). High patient loads and increased workflow pressures further complicate the coding process, often resulting in hurried or incomplete documentation. Inadequate institutional support structures such as limited supervision, unfavorable management policies, and absence of regular quality checks also contributed to coding challenges, confirming previous observations that organizational context shapes coding outcomes (Johnson & Martinez, 2023) [19]. The analysis also demonstrated that accurate clinical coding positively impacts billing accuracy and broader hospital functions. Respondents strongly agreed that precise coding facilitates not only effective billing and timely reimbursement but also enhances administrative decision-making, resource utilization tracking, and standardized reporting. This supports prior evidence that reliable coded data underpins reimbursement processes and healthcare analytics, enabling better planning and quality assessment (Johnson & Patel, 2023; Williams & Garcia, 2020). Moreover, the perceived contribution of coding to research and performance improvement aligns with arguments that coded datasets are foundational for epidemiological studies, policy formulation, and institutional learning (AHIMA, 2023; WHO, 2022) [20].

Importantly, respondents proposed several strategies to mitigate barriers to accurate coding and billing. Key among these were the provision of adequate coding manuals and tools, recruitment of sufficient coding personnel, mandatory completion of clinical documentation, and regular training programs. These recommendations resonate with best practices in health information management, which emphasize resource availability, training, and quality improvement systems as enablers of coding accuracy and data integrity (CMS, 2022; Phillips & Johnson, 2023). The study's findings collectively highlight that while individual knowledge and practice are necessary, system-level supports such as conducive work environments, supportive supervision, and integrated technology are equally critical to strengthen coding and billing performance [21].

## Conclusion

This study evaluated the impact of accurate clinical coding of health records on billing accuracy in selected hospitals in Egbeda Local Government Area, Ibadan, Oyo State, Nigeria. The findings indicate that although health information management professionals generally possess knowledge and apply coding practices, systemic factors such as poor documentation, inadequate tools, and staffing limitations hinder optimal coding accuracy. Accurate clinical coding was found to enhance billing precision, administrative and clinical decision-making, reporting systems, and research capabilities. Strategies such as provision of adequate resources, targeted training, supportive policies, and quality improvement systems were recommended to address barriers to coding and billing accuracy. Implementing these approaches can improve documentation quality, strengthen revenue cycles, and ensure reliable health information for both operational and strategic purposes.

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