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Quality Improvement Program: A Strategy for Clinical Documentation Improvement and Its Impact on Clinical Coding Practices in Niger Delta University Teaching Hospital

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ABSTRACT

Recognizing the fact the medical record as the main source of health information, and as such it is necessary to conserve perfect, complete and accurately perform clinical documentation that in turn impart on quality of coded in patient data. The researcher reviewed 690 inpatient medical records and scores of documentation of critical service element, representing five service five departments (medicine, surgery, pediatrics and obstetrics/gynecology, and delivery, antenatal and postnatal wards), were extracted from the database of the quality improvement committee of the Niger delta university teaching. Retrospective cohort study design was deployed to review records in the pre-implementation (2014) and post-implementation (2015), following the guidelines of the International Classification of Diseases, Ten Edition, Procedure Coding System (ICD-10th-PCS), and COHSASA scale for accuracy and completeness of coding of diagnoses and procedures, and documentation recorded records. Of the 690 items abstracted, 270 (Mean= 21.35) of records were in total compliance and accurately documented pre-implementation phase, while 2496 (aggraded Mean=30.46) in the post implementation phase were in total compliance, total none compliance in the pre-implementation phase were 1053, and 227 were also none compliance in the post implementation phase, the result shows statistically significantly different between the cohort groups of pre and post implementation with (P-value = >0.000), of the items abstracted based on departments, medical ward recorded 14(4.1%) correctly documented and 48(13.9%) correctly coded in the pre implementation phase, 54 (15%) and 88(25.5%) correctly documented and coded in the post phase, the result of some selected diagnosis representing departments, 200(58%) were assigned a correct codes, 84(24.3%) were assigned an incorrect codec, and 61(17.7%) were not coded in the before phase, and 298(86.4%) were assigned a correct codes, 22(6.4%) were assigned an incorrect codes, and 25(7.2%) were not coded in the after phase of the program. The more items s accurately documented, the more coded correctly in the post adoption phase than items inaccurately documented. It is the post implementation phase that recorded highest total compliance in document components of the audited records and scoring of critical service elements that met the benchmark for good quality medical records with respects to documentation and coding. A positive correlation between accurate documentation and correct coding was noticed, which affirm that high quality documentation impact on coding accuracy. It is believed that in order to achieve quality clinical documentation and coding, it is a shared responsibility of collaboration of clinicians to act based on their all-encompassing clinical knowledge, and clinical coding professionals to apply their ample disease classification proficiency.

KEYWORDS: Quality improvement, Clinical Documentation Improvement and Coding Accuracy.

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BACKGROUND OF THE STUDY

Clinical documentation improvement strategy is a process aimed at filling in the gaps that are missing and noticed in the chart written on the account of healthcare provider and patients' interface. Clinical documentation improvement has become a survival

tactic for acute settings such as tertiary hospitals. The Centers of Medicare and Medicaid has initiated strategies and measures that needs a department to close the loop of communication from medical coders and physicians. The medical coders are the individuals Who code the diagnoses or procedures that a patient is treated during hospitalized and the doctors are the ones who document (Baksh, 2018).

The clinical documentation improvement as substantiated in literatures, due to the deterioration in the quality of clinical documentation and the prevalence errors, which complicate all efforts that depends on high quality information on health care services are delivered. Clinical documentation is the process of creating a written or electronic record that describes a patient's history and the care given to a patient (Blair et al,. 2012; Wilbanks et al., 2016 and Wilesmith et al., 2024). It serves as an important communication tool for the exchange of information between healthcare providers and it is stored in a printed or electronic medical record (Duclos-Miller, 2016).

Accountability for the accuracy, reliable, availability, compliance, and protection of health information has not been well defined in healthcare organizations, thereby, leading to hampered decision-making and limited value for healthcare. Fully detailed clinical documentation by caregivers throughout the treatment process is paramount, more so necessary to validate medical necessity and to provide outcome data focused on moving toward the value-based healthcare market of the future. According to Wilbanks et al. (2016) good quality documentation has been defined as documentation that is correct and comprehensive, uses clear terminology, is legible and readable, timely, concise and plausible. Poor nursing documentation in the acute care setting may have negative impacts on patient outcomes and may also result in litigation (Duclos-Miller, 2016). This is made possible through thorough documentation of the patient episode that captured the cost of services provided. The integrity of the data is essential to the survival of every organization (Rains, 2024). The role of documentation improvement specialists and how they can ensure adequate documentation that can be translated into clinical codes. This is a potential role for clinical coders who understand both the clinical documentation and the needs of the end users of the coded data (Hay et al. (2020). The very basic components is a data dictionary and the first step towards interoperability and health information exchange. A lack of defined strategies and policies can lead to negative consequences, such as the endangerment of patient, duplication of tests and procedures, the outcome could be a significant loss of revenue and security breaches. The more specific the physician can be, the more accurate the code will be, which can improve the disease related grouping on the patient (Rains, 2017).

Accurate documentation of patient encounters is a key to the economic health of the hospital. Healthcare organizations often find that their clinical documentation does not accurately reflect the care they provide. This affects ongoing patient care, regulatory compliance, physician/facility profiles, legal protection/defense, and reimbursement. The Niger delta university teaching hospital introduced Quality Improvement program, which began in 2015 with the aim of identifying gaps that need to be closed to meet COHSASA (Council for health services accreditation of southern Africa) standard, and to be the first public hospital in Nigeria to secure COHSASA accreditation.

Traditionally, in the inpatient setting, health information management professionals check the data collected for discrepancies after discharge. Discharge summaries are scrutinized for deficiencies, and care provider response to query for any clarification. This process could be accelerated. Through concurrent clinical documentation review, unclear or conflicting documentation will be amended. The increased need for interpreting coded data for meaningful comparison and quality reporting has led to the expansion of the health information management professional's role in clinical documentation improvement (Ilog, 2014). The concept of what constitutes high-quality data relative to clinical documentation can be understood as elements of quality (e.g. accurate, complete, consistent, reliable, specific) (Alonso et al., 2020) and considered fit for-purpose (Riley et al., 2023a).

Service quality is the foundation and basis for every organization, to sustain and retain the trust and loyalty of customers for continuous patronage and word of mouth advertisement to other members of the external environment. The drive to keep the business afloat and to ensure patients has value for the money spent to acquire service must commiserate and correlate with the services provided. To this end, Quality improvement programs must be deliberate and exact to survive competition, its roots, which emphasizes small, low-cost, low-risk improvements and patient satisfaction. Chang (2016) asserts that Quality has a pragmatic interpretation as the non-inferiority or superiority of something; it is also defined as fitness for purpose. Quality is a perceptual, conditional, and somewhat subjective attribute and may be understood differently by different people. Consumers may focus on the specification quality of a product/service, or how it compares to competitors in the marketplace. Quality as viewed by (Cadilhac et al., 2017), is an elusive concept. Definitions range from the vague to the Martini advert ("doing the right thing, at the right time, in the right way, for the right person - and having the best possible results"2). Health professionals are therefore expected not only to provide excellent direct patient care, but to contribute to 'quality improvement', that is, the ongoing, systematic effort to improve patient outcomes and system performance (Mortimer et al, 2018). Quality improvement demand sustained effort over a substantial time frame to achieve.

The service provider cannot undertake quality check before the service is finally delivered to the customer. In order to assess the service quality the customer judges the expected service quality against the perceived quality when they receive it (Ramya et al, 2019).

Quality improvement is about giving the people closest to issues affecting care quality the time, permission, skills and resources they need to solve them. It involves a systematic and coordinated approach to solving a problem using specific methods and tools with the aim of bringing about a measurable improvement.

Although, the health information management department of Niger Delta University Teaching Hospital initiated Inpatient document review before coding program to identify deficiencies thereby documenting it on deficiency slip, this has suffered setback and become non-functional. Although, there was no formal staff assigned for this role, rather a shared service for the clinical coders. There is the lack of education for the medical team as to connecting their clinical terminology (medical language) to the coding standards, thus hampering the coder's understanding of the severity, risk of mortality and disease related grouping assigned on patient's encounter. Coding guidelines are not aligned with what doctors learned in medical school. Medical language does not totally correspond with the coding language. There is lack of consistent follow-up of queries and clarification on the floor. There is a need to analyze and improve workflow and processes to include making daily rounds with the residents, participating in their presentations and educating the interns and residents on documentation issues on a monthly basis. Improving physician documentation ensures that the patient's clinical course is clearly recorded.

STATEMENT OF THE PROBLEM

Accurate clinical documentation is indispensable for several reasons, such as support to effective patient care by providing a comprehensive and detailed record of the patient's medical history, diagnosis, and treatment plan. This information is crucial for healthcare providers to make informed decisions, coordinate care, and monitor patient progress medical history and current condition (Ayanbode et al., 2021). The quality improvement program is a strategy employed by the Niger Delta university teaching hospital to improve the quality of healthcare services and accuracy of clinical documentation of patient medical records among others. The program typically involve the idea of interdisciplinary collaboration, ongoing education and training, real-time feedback and monitoring, and technology-enabled solutions (Pallast et al., 2018 and Oladapo et al., 2021). It is worthy to note that, accurate clinical documentation is the basis for determining clinical coding, reimbursement healthcare organizations receive from payers, such as insurance companies and government programs (Burks et al., 2022).

Studies has reported that inaccurate or incomplete documentation can lead to coding errors, resulting in improper reimbursement and potential compliance issues (Campbell & Giadresco, 2020). This can have significant financial implications for healthcare organizations, potentially leading to denied claims, reduced revenue, and increased administrative costs (Opele, et al 2020). Additionally, poor documentation can impact the quality of care provided, as healthcare providers may not have access to complete and accurate information about the patient, accurate clinical documentation is essential for several reasons (AHIMA, 2020). This information is crucial for healthcare providers to make informed decisions, coordinate care, and monitor patient progress medical history and current condition (Ayanbode & Nwagwu, 2021).

OBJECTIVES OF THE STUDY

I. Evaluate clinical documentation improvement in the pre to post implementation of quality improvement program
II. Measure the quality of clinical documentation and accuracy of coding per departments
III. Assess accuracy of disease codes of selected common diseases per department

LITERATURE REVIEW

Conceptual Review of Clinical Documentation Improvement

Clinical documentation improvement has been utilized in the healthcare information management industry for decades. It has played a more critical role over the years. During the past years, clinical documentation improvement campaigns have gone from a leading voice mainstream, as hospitals strategizes to step up service outcome in accordance with the new medicare severity disease related grouping (DRG) system. Many factors stimulated healthcare organizations to establish regulatory policies and programs to increase inspection of quality and performance improvement initiatives. This framework proposed by (Torrey et al., 2012) highlights the multifaceted nature of documentation, emphasizing that it should not only be accurate and complete, but also timely, clear, and accessible to all relevant stakeholders (Davis et al., 2024).

Clinical documentation has been defined as "information that is chronicled about a person's episode of health care. The primary purpose of clinical documentation is to facilitate, safe, high quality and continuous care, and is stored within a health record" (Australian Commission on Safety and Quality in Healthcare, 2023). It needs to perfectly reflect medical events and decision-making for purposes of care continuity and as communication link. However, the quality and utility of clinical documentation has

influence to ensure data integrity that is well beyond the primary purpose of supporting patient care. The World Health Organization has defined data integrity as: the degree to which data are complete, consistent, accurate, trustworthy, and reliable and that these characteristics of the data are maintained throughout the data life cycle. The data should be collected and maintained in a secure manner, such that they are attributable, legible, contemporaneously recorded, original or a true copy and accurate. Assuring data integrity requires appropriate quality and risk management systems, including adherence to sound scientific principles and good documentation practices according to World Health Organization report in 2016 (Victorian Agency for Health Information, 2018). Clinical Documentation Improvement strategies are focused on harnessing and integrating knowledge of these relationships and communicating this to medical professionals, the aim being to ensure clinical documentation supports not only patient care, but also all external users of the health information.

Overview of Clinical Coding: Clinical coding, also known as medical coding, refers to the process of translating healthcare diagnoses, procedures, medical services, and equipment into alphanumeric universal codes (Campbell & Documentation review: Coders review the patient's medical record, including history, physical examination, test results, and treatment plans. Code selection: Coders select the appropriate codes from standardized coding systems (e.g., ICD-10, CPT) to represent the patient's diagnoses (Giadresco, 2020; Iyanda et al., 2015). The primary purpose of clinical coding is to: Standardize and classify medical information: Clinical codes, such as those from the International Classification of Diseases (ICD) and the Current Procedural Terminology (CPT) systems, provide a standardized way to represent a wide range of medical conditions, treatments, and services. This standardization allows for consistent data collection, analysis, and reporting across healthcare settings.

Quality Improvement as Strategy for Improved Clinical Documentation

Quality has a pragmatic interpretation as the non-inferiority or superiority of something; it is also defined as fitness for purpose as asserted by (Chang et al., 2016). Quality is a perceptual, conditional, and somewhat subjective attribute that is understood differently by different people. Consumers may focus on the specification quality of a product and service, or how it compares to competitors in the marketplace. Quality is defined as the evaluation of excellence, which makes a thing what it is envisioned. The concept of quality was mainly applied to products in the manufacturing sector. Definitions range from the vague (e.g. 'the totality of characteristics of an entity that bear on its ability to satisfy stated and implied need' (1) to the Martini advert ("doing the right thing, at the right time, in the right way, for the right person - and having the best possible results" (2). In defining the concept we either let it escape butterfly-like from our grasp or transfix it upon a pin. In either case we lose sight of what really constitutes quality (Auka, 2012) hold the view that quality derives from the assessment of what customers expected before using a product or service and their experience of what was delivered. Therefore, in the case of the academic library, if the service provided meets users information needs or expectations it can be considered that there is quality service. That is, when the information provided meets users 'needs and expectations and it is used by them, it might have a positive impact on users. (Klaus (1985) argued that service quality is a phenomenon experienced by individuals and is manifested in individual behavior. It is also a dynamic, complex configuration of physical, situation, and behavioral variables. Klaus (1985, p. 24) defined quality as "the shared experience of gain by participants and stable pattern of behavior associated with a given type of service encounter.

THEORETICAL REVIEW

From a theoretical viewpoint, the literatures on clinical documentation improvement programs, quality improvement are drawn from various disciplines and theoretical frameworks.

Sensemaking Theory: Offer insights into the cultural and social dynamics involved in the adoption of clinical documentation improvement programs, which includes the need for buy-in from healthcare providers and the importance of aligning clinical documentation improvement initiatives with organizational goals and values as stated by (Aron et al., 2011). It is primarily developed by organizational psychologist (Karl, 1995), focuses on how individuals and groups create meaning and understanding from ambiguous or uncertain situations. The theory is all above the process where people actively interpret and make sense of experiences, often in the face of incomplete or contradictory information. The theory, is a framework for understanding how individuals and organizations make sense of complex and ambiguous situations. It focuses on the process of creating meaning in the face of uncertainty, rather than simply seeking accurate information. The theory highlights the importance of identity construction, retrospective interpretation, and social interaction. The key concepts of the sensemaking theory are as follows; Enactment, Identity, Retrospect, Cues and Plausibility.

Furthermore, quality improvement theories, such as the Model for Improvement (Langley et al., 2009), offer a theoretical framework for conceptualizing clinical documentation improvement programs as part of a broader effort to enhance patient safety and care quality through systematic documentation practices (Deitrick et al., 2013).

Deming's Theory of Quality Management: This theory was put forth by Deming (Shewhart et al., 1986). It rests upon fourteen points of management derived from four profound points; system appreciation, knowledge variation, knowledge theory and

psychology knowledge. According to Deming, system appreciation entails coming to terms with the procedures that the organization's processes and systems operate. When it comes to variation knowledge, the theory posits that there should be an understanding of the variation occurring and the causes of variation. Knowledge theory is concerned with the understanding what can be known while on the other hand psychology knowledge deals with human nature. Deming notes that awareness of the various knowledge types in an organization comprises important dimensions of quality service management.

The theory uses fourteen points to advocate for quality service management. These points are: the creation of constancy of purpose, adoption of new philosophies, eradication of dependencies on mass inspections, desist from awarding business based on price, aiming for continuous production and service improvement, bringing cutting edge on-the-job training, implementing cutting edge leadership methods, abolition of fear from the company, deconstruction of departmental barriers, getting rid of quotas and standards, supporting craftsmanship pride, ensuring training and education for everyone and ensuring that the top management structure is supportive.

Document Theory: It examines the concept of a document and how it can serve with other concepts to understand communication, documentation, information, and knowledge as postulated by Buckland, 2015). Knowledge Organization itself is in practice based on the arrangement of documents representing concepts and knowledge. The word document commonly refers to a text or graphic record, but, in a semiotic perspective, non-graphic objects can also be regarded as signifying and, therefore, as documents. The steady increase in the variety and number of documents since prehistoric times enables the development of communities, the division of labor, and reduction of the constraints of space and time. Documents are related to data, facts, texts, works, information, knowledge, signs, and other documents. Documents have physical (material), cognitive, and social aspects (Buckland, 2015).

The theoretical review probes into the multidisciplinary landscape of clinical documentation improvement strategies, accent the viewpoints that various literatures contribute to the understanding of the study. Organizational behaviour theories, like Sensemaking, document and deming's theory of quality management Theories (Styhre et al., 2002) offer insights into the social and cultural dynamics involved in the implementation of clinical documentation improvement programs. These theories highlight the need for healthcare providers to collectively make sense of the changes brought about by clinical documentation improvement initiatives and align them with their existing values, beliefs, and work practices (Aron et al., 2011). Health economics theories, particularly those related to reimbursement models and revenue cycle management, help explain the potential financial benefits of clinical documentation improvement programs (Awogbami et al., 2020). These theories underscore the importance of accurate documentation in supporting appropriate reimbursement, reducing denied claims, and optimizing an organization's financial performance (Manchikanti et al., 2017). Lastly, quality improvement theories, such as the Model for Improvement (Langley et al., 2009), provide a theoretical foundation for understanding clinical documentation improvement as a systematic approach to enhancing patient safety and care quality through continuous documentation improvement (Deitrick et al., 2013). In summary, the literature review highlights the empirical evidence supporting the positive impact of clinical documentation improvement programs on coding accuracy, reimbursement, and quality of care, while also drawing upon conceptual and theoretical frameworks from various disciplines to provide a more comprehensive understanding of the study variables.

Practice Theory: Practice theory refers to a set of approaches that focus on studying people's actions and behaviors rather than their internal mental processes. The practice theory was developed by Pierre Bourdieu in 1977 (Piere, 1977; Giddens, 1979; and De Certeau, 1984). It places emphasis on the routine actions, material elements, bodily actions, and meanings within a social context. It provides a framework for understanding how these elements of actions and behaviors of health information management professionals' intersect and reproduced patient service action demands.

Conceptual Model for the Study

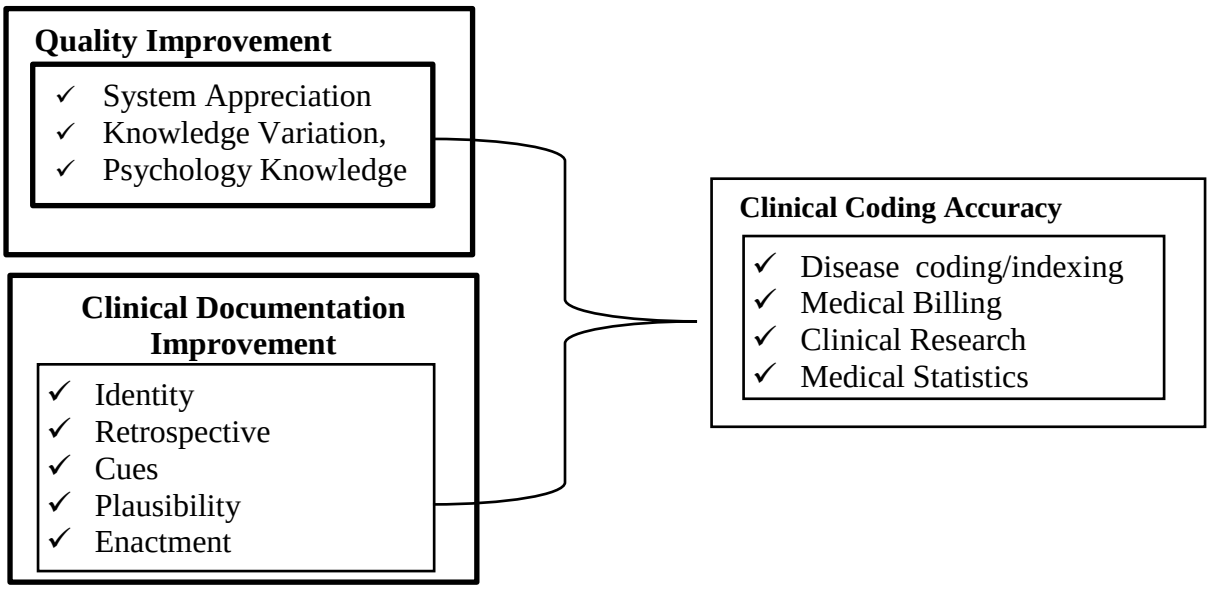


Figure 1: Researcher's Conceptual Framework

METHODOLOGY

This study is a retrospective cohort review of secondary data generated from the assessment scores of the quality improvement committee database, and discharged patient records in Niger delta university teaching hospital, reviewed for clinical documentation improvement and accuracy of coding for a 4 month period from April through July 2025. Randomly 690 medical records were retrieved from five inpatient departments (medicine, surgery, obstetrics and gynaecology, pediatrics and delivery/antenatal/postnatal) for pre to post implementation of the quality improvement program. A retrospective review was performed utilizing data from the quality improvement committee to compare the year before (2014), and after (2015).

The quality improvement committee was implemented in 2014 to improve the quality of health services, inpatient record documentation among others by establishing and utilizing a step-by-step, systematic process: 1. Structured note from the COHSASA assessment scale to score and classify each item as none compliance, partial and total compliance of the medical records components such as; accuracy, legible, consistency, comprehensiveness, thorough, timely, professional language, organized, real-time documentation, prompt completion, patient safety, and legal protection, 2. Using the International Classification of Disease, and procedure coding system Ten Revision (ICD-10-PCS) system, each item was audited for accuracy and completeness of the assigned code. Each item was classified according to the scoring system for measuring quality of coding; correct coding (8 -10), incorrect coding (5- 7), and not coded (0 – 4). A score of eight was assumed to be the benchmark for good quality. However, the remaining numbers of the score do not reflect a descending/ ascending rank of quality coding expert advisor.

The goal of the quality improvement program was a deliberate strategy to improve the quality of healthcare services, clinical documentation in the medical record by the physicians to accurately reflect the diagnoses, and management plans among others. The database and medical records of the two-cohort group was used to provide detailed analysis of the pre-implementation and post implementation, 2014 the year prior to and 2015 the year after. A retrospectively recorded data was extracted and used to evaluate the pre-to-post-implementation scores obtained from clinical service elements of in-patient care. The study used data collection checklist to extract scores.

A total of 2,413 discharged patient medical records was recorded between 2014 to 2015, and were reviewed over the two phases, 345 in the pre-phase group and 345 in the post-phase group, using taro yamane's sample size determination to arrive at 345 due to the study limitation (time, resources and others). Scores of medical records were available in the program registry (Database). The scoring system was considered by the COHSASA scale, and coding experts for easy interpretation of data. All data were analyzed using SPSS software (SPSS Inc., version 29). Independent-sample t test analyses were used with significance defined as $p < 0.05$.

RESULTS

A total of 690 in-patient medical records were reviewed, expending the scores from the Quality Improvement Committee assessment scorings. The study was conducted within 4-month (April – July, 2025) period. The patients' records reviewed were based on cross-sectional according to departments, of the 345 records reviewed, 102 were of medical, 51 Surgical, 67 from Obstetrics & Gynae, 46

from Paediatrics, and 79 from Delivery, Antenatal and Postnatal wards respectively. The two cohorts were significantly statistically different in terms of clinical documentation content in the post and pre-implementation phases (p-value, .000), according departments' journey on clinical documentation improvement was a total of 17.1% noted in the pre-period, from then tremendous improvement was recorded at 51.0% were accurately documented in the pre-period, as shown in Table 3. A significant statistical difference was also found between the pre-period mean of 1.80 clinical documentation and post-period mean of 2.22 (p <.000, t-test), indicating that the post cohorts had a higher clinical documentation improvement.

The distribution and quality of clinical documentation and coding accuracy between departments as shown in Table 3, the result shows that there is difference in the accuracy of documentation between departments, that is equated to medical service provider's adherence and performance show that they are statistically significant (P value). The quality of clinical documentation and accuracy of coding was the highest in the medical department 54 (15%), also Hypertension representing department of medicine had 24.1%, followed by paediatrics 45(13.0%) in the post-implementation period as shown in Table 4. More so, the accuracy of coding was noticed to vary from departments sampled for this study, with the highest from medicine with 88(25.5%), and delivery, antenatal/postnatal department was 18.6% were coded correctly (met a score of 8 - above) of the total 345 medical records abstracted in the post-implementation period. This difference was statistically significant (P-value < 0.00, t-test).

While the number of actual or observed accurate code did significantly change, there was a significant increase in the expected accurate coding from pre-to post-

implementation. The anticipated number of accurate coding in the pre-implementation phase was 49%, while in the post-phase the expected number of accurate coding was 82.9% (p < 0.00, t-test). The noticed number of items with incorrect codes in the pre-implemented period was 24.3%, and the number of medical records with incorrect codes in the post-implementation period was 6.4%.

The five departments Diagnosis selected based on department (specialties) as shown in Table 4, revealed that Hypertension (HTN) recorded 24.1% accurate coding in the post implementation phase, and 11.3% in the pre-implementation phase. A total of 17.7% and 7.2% were not coded in the pre- and post-implementation phases. The Clinical documentation did however significantly improve with a mean difference 0f 1.80 in 2014 (pre-implementation), and 2.22 in 2015(post-implementation) (p < .000) as shown table 2.

Table 1. Clinical documentation in the pre and post implementation of Quality Improvement

Table 1 shows significant statistical difference of clinical documentation improvement in the post implementation (2015), the mean score also signifies difference of 30.46, as against 21.35 in the pre-implementation phase (2014). The above result on the above Table is a pointer to the fact that quality improvement as a strategy for clinical documentation is the right approach in addressing clinical documentation gaps. The total compliance in the post (2015) implementation shows more than the pre-implement. The none-

Key Aspect of patient records Documentation Content	**2014**				**2015**				
	None Compliance	**Partial Compliance**	**Total Compliance**	**Mean**	**None Compliance**	**Partial Compliance**	**Total Compliance**	**Mean**	**P-Value**
Accuracy	150	195	0	1.57	29	137	179	2.43	>0.002
Legible	121	183	41	1.77	34	123	188	2.45	>0.000
Consistency	72	273	0	1.79	29	103	213	2.53	>0.001
Comprehensiveness	12	304	29	2.05	29	189	127	2.28	>0.002
Thorough	91	225	29	1.82	0	69	276	2.80	>0.005
Timely	151	194	0	1.56	7	108	230	2.69	<0.002
Professional Language	72	273	0	1.79	0	137	208	2.60	>0.005
Organized	150	185	10	1.57	99	29	217	2.20	<0.001
Real-time Documentation	121	183	41	1.77	0	132	213	2.62	<0.000
Prompt Completion	72	273	0	1.79	0	154	191	2.55	<0.001
Patient Safety	12	304	29	2.05	0	103	242	2.70	>0.05
Legal Protection	29	225	91	1.82	0	133	212	2.61	>0.000
Total	**1053**	**2817**	**270**	**21.35**	**227**	**1417**	**2496**	**30.46**	
Key: 0 – 45 (None Compliance), 50 – 75 (Partial Compliance), 80 &Above (Total Compliance)									

compliance in the post implementation phase is fewer with 227 than the pre-implementation phase of 1053 none compliance in the clinical documentation contents. Correspondingly, analysis shows that the pre-implementation of quality improvement program recorded 2817 partial compliance, while the post-implementation phase recorded 1417 partial compliance in clinical documentation. More so, table 1 reveal that, in the initial pre-implementation period, there were 270 total compliance in the documentation content, while in the post-implementation period, there were 2496 total compliance. The result in the table above shows that there is strength in the adoption and implementation of quality improve program in the aspect of improvement in clinical documentation.

Table 2. Independent t- test comparing quality of clinical documentation in pre and post implementation

Group Statistics

	Year in review	N	Mean	Std. Deviation	Std. Error Mean
Documentation Content	2014(Pre)	345	1.80	.693	.037
	2015(Post)	345	2.22	.638	.034

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Documentation Content	Equal variances assumed	2.897	089	-8.348	688	.000	-.423	.051	-.523	-.324
	Equal variances not assumed			-8.348	683.267	.000	-.423	051	-.523	-.324

The table above is the result of the independent t-test, the P-value of the Lavene's test is > .05, which implies that there is homogeneity of variance (i.e. equal variance assumed), in this study the P-value (Lavene's test) = 0.89 >.05, therefore first row is considered for the interpretation of the above table is based on equal variances assumed row. From the result it shows that the probability value p-value (.000) is less than .05, this implies that there is statistically significance difference in clinical documentation improvement between the pre implementation and post implementation phases. Also, the 95% confidence interval shows that the lower and upper are both negative, implying that there is statistically significance difference in clinical documentation improvement. More so, from the group statistics it shows that the compared Mean for 2015 is 2. 22 as against 1.80 in 2014, also showing clinical documentation improvement in the post implementation period.

Table 3. Clinical documentation versus Coding according to departments

Department	**Pre-implementation**			**Post-implementation**	
Hospital Wards	**Total Number of abstracted ..**	**Number of records accurately documented %**	**Number of records correctly coded%**	**Number of records accurately documented %**	**Number of records correctly coded%**
Medical Ward	102	14(4.1%)	48(13.9%)	54 (15%)	88(25.5%)
Surgical Ward	51	13(3.8%)	27(7.8%)	24(7%)	38(11.0%)
Obstetrics/Gynaecology Ward	67	10(2.9%)	33(9.6%)	34(9.9%)	57(16.5%)
Paediatrics Ward	46	7(2.0%)	27(7.8%)	19(5.5%)	39(11.3%)
Delivery/AN/PNWs	79	15(4.3%)	34(9.9%)	45(13.0%)	64(18.6%)
Total	345	59(17.1%)	169(49%)	176(51.0%)	286(82.9%)

The above table 3 shows the result on clinical documentation and clinical coding according to the hospital department of in-patient service care, with retrospective of the pre-implementation and post-implementation phases of quality improvement program, as displayed above. The unit sample size were determined as per patient volume of in-patient service demand within the period under review. The result shows that in the post-implementation period male/female medical wards, 15% of in-patient records were

accurately documented, and 25.5% records were also correctly coded. The result were similar with other wards such as, male/female surgical, obstetrics/gynaecology, paediatrics, delivery, antenatal and postnatal wards respectively. The result shows that male and female medical wards recorded more accurate clinical documentation and correctly coding in the post-implementation phase of quality improvement program. This result is better interpreted and anchored on the impact the program.

Table 4. Quality of coding of selected common diseases per department (Specialty)

Diseases per Specialty (Department)	2014			2015			P-Value
	Accurate Code%	Inaccurate Code %	Not Coded	Accurate Code%	Inaccurate Code %	Not Coded%	
Hypertension (I10)	39(11.3%)	34(9.9%)	29(8.4%)	83(24.1%)	14(4.1%)	5(1.4%)	> 0.00
Appendectomy(0DTJ4ZZ)	44(12.8%)	5(1.4%)	2(0.6%)	49(14.2%)	2(0.6%)		> 0.01
Celphalo-Pelvic Disproportion with obstructed labor(O65.4)	38(11.0%)	18(5.2%)	11(3.2%)	57(16.5%)	4(1.2%)	6(1.7%)	> 0.00
Bronchiopneumonia (J18.0)	27(7.8%)	15(4.3%)	4(1.2%)	43(12.5%)	2(0.6%)	1(0.3%)	> 0.05
Eclampsia during Labor (O15.1)	52(15.1%)	12(3.5%)	15(4.3%)	66(19.1%)	0 (0%)	13(3.8%)	> 0.05
Total	200(58%)	84(24.3%)	61(17.7%)	298(86.4%)	22(6.4%)	25(7.2%)	
Key: Scoring system for measuring quality of coding; Correct Coding (8 -10), Incorrect Coding (5- 7) and Not Coded (0 – 4)							

The table above is the retrospective review on the quality of coding of some selected diseases peculiar to departments, from the result, total number of accurate codes were 58%, 24.3% inaccurate code and 17.7% not coded in the initial pre-implementation of quality improvement as a strategy for clinical documentation improvement. However, in the proceeding post-implementation phase the result shows an improved quality of codes, reduction in inaccurate codes and lower percentage of not coded records. This result reflect the true position of the preceding tables, by revealing that the quality improvement program adopted is a right decision that has impacted on clinical documentation improvement and other aspects of healthcare administration and management.

DISCUSSION

Improved clinical documentation is the anchor, as synopsis for evaluating caregiver expertise contribution in the patient medical care journey. This entails technical and concise efforts of every curative and allied healthcare service providers to act in accordance with professional ethics, rules and policies shielding their actions in the premise of legal jurisdiction.

This study shows significant degree of clinical documentation improvement, coding accuracy, and department quality adherence in the post-implementation period of the quality improvement program, the scores of the assessment done by the quality improvement committee shows that 2496 met the standard for total compliance in the post implementation phase, using COHSASA scoring scale (scoring of eighty & above). The aggregated mean (Mean=30.46) in 2015, the study outcome implies statistically significant difference in the period reviewed, thereby showing the strong impact of the quality improvement program (Table 1). The findings of this study is in coherence with (Seligson et al., 2021) result that shows significant improvements in E/M charges submitted and reimbursement collected following the implementation of standardized clinical documentation as well as billing education among healthcare providers.

The coding accuracy in the five department is 286(82.9%) in the post implementation period, this reflect coder performance, exceeded the documentation errors (inaccurate documentation, not documented) which reflect physician performance, but coding errors (incorrect coding, not coded) declined with 6.4% (p-value=0.00) (2015). The result validate quality improvement resourcefulness in coding accuracy. Other study also determine clinical documentation and quality of clinical coding, and the effect of other intervention programs (Elkbuli et al., 2018), demonstrated that it is likely that there is differences between the two cohort groups were due to impart improvement in documentation. To be able to report good outcomes requires both good clinical care and accurate documentation. Good clinical care without good documentation component that can result in outcomes that are worse than expected standards. The premise of clinical documentation improvement is simple: engage clinicians to improve the clinical documentation in the medical record in "real time" so that it is fit for reporting, analysis and reimbursement (Hay et al., 2020). The coding practices must showcase all critical data that reveals the true state and accurate picture of the patient. However, the findings of this study is in disavowal with a study report of overall coding accuracy rates remained stable over the course of time regardless of the modality of the educational intervention (Nguyen et al., 2017).

The differences between physician performances (clinical documentation) across the five departments in this study were significant, implying a higher level of concordance between clinical documentation when compared to coding, in whom differences in

performance across the five departments were statistically significant. The clinical documentation of physicians and that of coders (accurately documented, and correctly coded) was the lowest 19(5.5%) in the medical records audited for the department of paediatrics and lowest 38(11.0%) correctly coded for surgical departments, more so, the accuracy of codes for hypertension representing medicine was the highest accurately coded (24.1%), while Delivery/AN/PNWs as zero (0%) not coded in the post implementation period (2015). This variance could be related to the coders' level of education and training as well as increased complexity of medical records and terminology (i.e. documentation component) in the departments. There is a positive correlation between accurate documentation and correct coding as noted in this study, which could support the conclusion that high quality documentation enhances coding accuracy (Alonso et al., 2020). The quality of coded data in also buttered on physician's knowledge to provide quality clinical documentation useful to coders to the quality of coding, as such incorrect code is anchored on the physician knowledge of clinical coding. This was confirmed and reported in a study that physicians in south-south region of Nigeria, with knowledge on coding were 45.5%, and those without were 54.5% among 200 respondents (Kurokeyi, 2017).

The result of the pre-implementation period shows linkage of poor clinical documentation, as reported in a study that there are several problems, identified in health records that influence the coded data such as the lack of or unclear documented information; the variability in diagnosis description; "copy & paste"; and the lack of solutions to solve these problems (Alonso et al., 2020). In order to achieve a best practice clinical coding healthcare service providers must specify and consider all the documentation components and comorbidities, coupled with grading or staging, clearly documented data that reflect good care, connecting associated conditions, procedures, and other accompanying findings. The findings of this study indicates significant statistical difference, which is interpreted based on the lower and upper values in the Independent Samples t-Test. This study has demonstrated that, improved clinical documentation and quality of coding is strengthened by quality improvement program, as reported to have strong influence on the outcome in the post implementation phase, also it did improve on the quality of clinical coding.

The analysis shows that the coded data, has same statistical trend as demonstrated, accentuating that accurately coded data originate from accurate documentation. Failure to list the diagnosis, the use of improper ICD-10 terminology, and to abide by the clinical documentation guidelines were noted as source of error, but were felt to have a negative influence on medical record documentation and coding quality. What is needed are clear and unambiguous guidelines to streamline the documentation and coding process, which might explain the skepticism that surrounds the new Health Care Financing Administration (HCFA) guidelines.

In summary, the assessment done by the quality improvement committee, 2496 (723.5%) were total compliance, the required standards for a good quality clinical documentation. The positive correlation between accurate documentation and correct coding supports the conclusion that high quality documentation enhances coding accuracy. These data, suggest room for improvement, which can be achieved through better collaboration of clinicians, who have extensive clinical experience, and coding professionals, who have broad disease and procedure cataloguing system proficiency.

CONCLUSION/RECOMMENDATION

Adopting clinical documentation improvement interventions, such as quality improvement program is a proven strategy associated with statistically significant difference in the observed clinical documentation improvement, increased quality of codes, coding and documentation standard practices as per department in the period of the study retrospectively. Coding accuracy results in improved clinical documentation components measures by none-compliance, partial and total compliance, as such more accuracy was reported in the post initiation period in terms of some selected morbidities specific to departments, reduced none coded and correct documentation. The following recommendations are hypothesized based on the study findings.

In order to achieve excellent clinical documentation and accuracy of disease and procedure coding, healthcare organizations and the quality improvement committee should as a matter of urgency adopt an implementable robust Clinical Documentation Improvement program that focuses on accurate, complete, and timely documentation of patient care, which in turn impacts coding accuracy, reimbursement, and overall quality of care. Also, management should conduct a comprehensive training programs, which foster collaboration between physicians, data transcribers and coders by exploring the benefit of technology. The quality improvement committee to conduct regular assessment of service elements.

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