

Data quality assessment in healthcare: a 365-day chart review of inpatients' health records at a Nigerian tertiary hospital

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Received 10 January 2012

Accepted 20 June 2012

Published Online First
 14 July 2012

ABSTRACT

Background Health records are essential for good health care. Their quality depends on accurate and prompt documentation of the care provided and regular analysis of content. This study assessed the quantitative properties of inpatient health records at the Federal Medical Centre, Bida, Nigeria.

Method A retrospective study was carried out to assess the documentation of 780 paper-based health records of inpatients discharged in 2009.

Results 732 patient records were reviewed from the departments of obstetrics (45.90%), pediatrics (24.32%), and other specialties (29.78%). Documentation performance was very good (98.49%) for promptness recording care within the first 24 h of admission, fair (58.80%) for proper entry of patient unit number (unique identifier), and very poor (12.84%) for utilization of discharge summary forms. Overall, surgery records were nearly always (100%) prompt regarding care documentation, obstetrics records were consistent (80.65%) in entering patients' names in notes, and the principal diagnosis was properly documented in all (100%) completed discharge summary forms in medicine. 454 (62.02%) folders were chronologically arranged, 456 (62.29%) were properly held together with file tags, and most (80.60%) discharged folders reviewed, analyzed and appropriate code numbers were assigned.

Conclusions Inadequacies were found in clinical documentation, especially gross underutilization of discharge summary forms. However, some forms were properly documented, suggesting that hospital healthcare providers possess the necessary skills for quality clinical documentation but lack the will. There is a need to institute a clinical documentation improvement program and promote quality clinical documentation among staff.

INTRODUCTION

Health records document the pertinent facts of a patient's life and health history, including past and present illness(es) and treatment(s), written down by the health professionals handling the patient's care. The records must be compiled in a timely manner and contain sufficient data to identify the patient, support the diagnosis or reasons for the healthcare encounter, justify the

treatment, and accurately document the results.¹ They are the visible evidence of the hospital's clinical activities and accomplishments. Since they are the basis of any health institution, documentation of every contact of each patient with a healthcare provider must be comprehensive and robust to the scrutiny of auditors or attorneys.²

It is often said that an adequate health record indicates adequate care, and conversely, a poor health record indicates poor care. Indeed, a patient who received poor care can have a complete and thorough record, but the reverse is more likely to be true, that is, a patient may have received adequate care which is poorly documented.¹ The quality of health records depends on the health information recorded by the healthcare professionals authorized to provide and document such care. The term 'data quality' refers to the characteristics and attributes of the data, specifically: accuracy, accessibility, comprehensiveness, consistency, currency, definition, granularity (detail contained), precision, relevancy, and timeliness.³ Problems with data quality make the health record linkage process cumbersome, unreliable, and of little value to organizations, providers, and patients.⁴

The information contained in the record is essential, but the process of documenting it is often considered a lesser priority by many health caregivers. A busy physician may inadvertently record a progress note in the wrong patient's health records. A nurse may get a call to assist a patient and forget to record medication given to another patient.¹ The value of health records is ultimately dependent on their completeness and accuracy in providing patient information. This may vary with physician-patient communication, the patient's condition and the physician's documentation style. Variability in coding diagnoses and procedures may be related to the coder's training and experience. In addition, inadequate physician documentation may also affect accurate interpretation of medical charts by coders and consequently the validity of administrative data.⁵ Clinical documentation in computer-based records has been found to be more complete and more appropriate for clinical decisions than that in paper-based records.⁶ In Nigeria, health record production is still based on dictation and paper-based

systems as electronic health records and modern health information systems have not been widely adopted or where adopted (unpublished data), have not been thoroughly implemented. When dictation or a manual system is used, the production of accurate health records depends on the providers' record keeping practices.⁷

Good quality healthcare data play a vital role in the planning, development, and maintenance of healthcare services. Quality health records are essential for the maintenance of optimal healthcare.⁸ Health record review is important for quality assessment and clinical epidemiology research as researchers can access data on previous events.⁹ Improving the quality of healthcare data in patient health records can affect clinical and administrative decision making in many ways¹⁰ and impact on health economics, increase patient safety, provide evidence to support clinical decision making through healthcare research, and improve the information provided to patients on their illness and care, and the effectiveness of clinical care pathways.

Patient health record review has improved the chart documentation of care by medical house officers¹¹ and has impacted on the quality of health record documentation.¹² It has enhanced communication among healthcare teams resulting in improved patient care.¹³ Health record review offers an attractive mechanism for evaluating clinical competence because of its ease of implementation relative to other methods.¹¹

Ensuring quality patient care information is challenging in light of complex and ever changing healthcare delivery systems.¹ Responsibility devolves to all healthcare providers as many healthcare administrators recognize that quality improvement can enhance services offered,⁸ with leadership roles taken by healthcare administrators, senior doctors, and senior staff in all departments. These personnel need to ensure that their staff maintain quality healthcare documentation at all times. Most importantly, senior members of health information departments must ensure adequate documentation collection, analysis, and assessment in order to guarantee the completeness, availability, and accessibility of health records.⁸ Therefore, healthcare institutions must facilitate regular analysis of health records so that good patient care information systems are maintained.

Inadequacies in clinical documentation have been reported at the Federal Medical Centre, Bida by the Department of Health. This study sought to verify such information more scientifically by assessing the quantitative properties of inpatient health records at the hospital.

METHODS

Study objective

The objective of this study was to assess the quantitative properties of inpatients' health records at the Federal Medical Centre, Bida, Nigeria.

Setting

The study was carried out using selected discharge folders of patients from all 13 wards of the Federal Medical Centre, Bida. These wards were further grouped into six specialties for data clarity and brevity as follows: accident and emergency, medicine, obstetrics and gynecology, pediatrics, psychiatry, and surgery.

Study materials

The paper-based health records of patients admitted and discharged between January 1 and December 31, 2009 were reviewed. A health record review form designed by Abdelhak and published by WHO¹³ was modified and used by the authors. The form consists of 23 questions with the answers 'yes', 'no', or 'not applicable' and

evaluates the following: promptness of documentation by contributors (within the first 24 h of the decision to admit the patient was communicated), clinical quality and detailing, laboratory investigation orders, discharge decisions and follow-up plans, assembly and discharge analysis, and clinical coding.

Participants and sampling

This retrospective review took place between November 2009 and June 2011. Nine of the authors ITA, AAS, OEY, AAA, OOA, LMO, MA, OAA and MWH participated in the weekly generation of lists of discharged patients which was based on the daily ward forms. They also participated in the selection, case retrieval and filing of selected records. They monitored and participated in chart review and data abstraction and ITA entered abstracted data into SPSS. These nine abstractors are experienced health information management professionals formally trained in clinical coding which is essential for data abstraction.

A stratified random sampling method was used to select the health records of 15 discharged patients at each weekly review meeting to give a total sample size of 780 records (9.20% of hospital discharges in 2008¹⁴). The three most senior personnel among the abstractors (ITA, OEY, AAS) validated the abstractions carried out by the six others.

Statistical analysis

The statistical software SPSS V.17.0 was used for data analysis with results presented as simple frequency, cross-tabulation, a bar chart, means, SDs, and correlation coefficients.

Ethics

Ethics approval to conduct this research was granted by the Research Ethics and Review Committee of the Federal Medical Centre, Bida. Ethics requirements demand that patients give explicit consent for their records to be used in research, but as this was a retrospective study it was difficult to obtain consent from individual patients. However, local research ethics committees can approve such research when access to health records is essential for the research and consent is not practical.¹⁵

All direct identifiers of patients were removed before data abstraction and subsequent transfer of information onto the computer system. The only possible identifier left was the unit number which was used to track duplication and monitor abstraction processes. However, as patient unit numbers are not given in the study, all patients' health records were essentially de-identified and the individuals cannot be identified.¹⁶

RESULTS

Demographic patterns of abstracted records

A total of 732 records (93.85%) were abstracted from the 780 identified; the remaining 48 records were missing from the

Table 1 Data reliability, consistency, and responsibility for care

Documentation standards	N	n (%)
Record documented by clinicians within the first 24 h of admission	732	721 (98.49)
Nursing care plans documented within the first 24 h of admission	732	627 (85.66)
Patient's name properly documented on the first page of all continuation sheets	732	551 (75.27)
Unit number recorded on the first page of all continuation sheets	732	431 (58.88)
Progress notes documented each day	732	672 (91.80)
Progress notes signed and dated each day	672	645 (95.98)
Investigation order forms signed and dated	732	528 (72.13)

Table 2 Clinical detailing and quality assurance

Documentation standards	N	n (%)
Record contains past medical history	732	642 (87.70)
Provisional diagnosis documented in the records	732	690 (94.26)
Discharge notes recorded	732	640 (87.43)
Discharge summary completed	732	94 (12.84)
Discharge summary contains summary of hospitalization	94	90 (95.74)
Discharge summary contains information on treatment and medication administered	94	89 (94.68)
Discharge summary contains follow-up details	94	88 (93.62)

shelves. Twenty-one (2.89%) of the analyzed patients had more than one admission during the period under review.

Abstracted records were from the departments of obstetrics and gynecology (336, 45.90%), pediatrics (178, 24.32%), accident and emergency (140, 19.13%), medicine (38, 5.19%), surgery (30, 4.09%), and psychiatry (10, 1.37%). These percentages reflected the following hospital discharge patterns given in the hospital statistics for 2008¹⁷: obstetrics and gynecology 38.60%, pediatrics 23.10%, accident and emergency 23.70%, medicine 6.50%, surgery 6.4%, and psychiatry 1% of total discharges. The relationship between these hospital statistics and study data is statistically significant: $r(4)=0.98$, $p<0.05$ with a critical value of 0.81.

Data reliability and consistency, and responsibility for care

Table 1 provides data on responsibility for care, consistency in clinical documentation, and reliability. Within the first 24 h of admission, 721 (98.49%) records had documentation by clinicians and 627 (85.66%) by nurses. Patients' names were correctly documented on the first page of progress notes in 551 (75.27%) records and unit numbers in 431 (58.88%) records. Daily progress notes were written in 672 (91.80%) records, 645 (95.98%) of which were signed and dated. Finally, investigation orders were signed and dated in 528 (72.13%) of the records.

Clinical detailing and quality assurance

Table 2 shows that 642 (87.70%) records contained information on past medical history, 690 (94.26%) recorded the provisional diagnosis, and 640 (87.43%) had discharge notes recorded. However, a discharge summary was completed in only few (94, 12.84%) records. The three subsections of the discharge summary forms analyzed were all well documented: summary of hospitalization (90, 95.74%), treatment and medication administered (89, 94.68%), and follow-up details (88, 93.62%).

Essential documentation by specialty

The subspecialty distribution of quality documentation is given in table 3. Prompt documentation within the first 24 h of admission was highest (100%) in surgery and lowest (90%) in psychiatry; documentation of patients' names on every page of

the progress notes was highest (80.70%) in obstetrics and gynecology and lowest (65.70%) in pediatrics; correct entry of unit numbers in progress notes was highest (70%) in surgery and lowest (40%) in pediatrics; completion (utilization) of discharge summary forms was highest (23.33%) in surgery and lowest (0%) in psychiatry; regular entry of the principal diagnosis in the discharge summary forms was highest (100%) in medicine and lowest (0%) in psychiatry; and proper documentation of investigation orders was highest (91.10%) in obstetrics and gynecology and lowest (40%) in psychiatry.

Assembly, discharge analysis, and clinical coding

The majority (454, 62.02%) of the patients' health records were chronologically arranged and continuation sheets held together with file tags (456, 62.29%) and most (590, 80.60%) records were found analyzed and properly coded before subsequent return to the filing areas.

DISCUSSION

The abstracted records reflect the discharge patterns at the Federal Medical Centre, Bida in 2008. All specialties and subspecialties in the hospital were covered in contrast to the study by O'Neil *et al*¹⁸ where only one department was examined. In our study, records of maternal healthcare constituted almost half (336, 45.80%) of the total records examined.

Generally, our results demonstrate consistency and promptness in documenting care. This is in accordance with the findings by Durkin² but contrary to those of Gunningberg *et al*¹⁹ where the quality of documentation in patients' health records was poor overall. However, our study revealed that laboratory investigation orders were not consistently signed when ordered, the patient's unit number was often not correctly recorded, and discharge summaries were largely not utilized. Failure to sign forms ordering investigations might reflect a reluctance to take full responsibility for care, while the only fair entry of unit numbers would result in the loss of records of individual patients. The unit number is the unique identifier that distinguishes one patient from another especially in the study setting (Bida) where more than one member of a family may share the same name. Non-completion of the discharge summary is contrary to clinical documentation standards as identified by Kind and Smith.²⁰ Incorrect entry of unit numbers and non-completion of discharge summaries resulting in incomplete medical charts produces suboptimal administrative data for management decision making.⁵ Nevertheless, when discharge summaries were written, they were correctly documented, suggesting that hospital healthcare providers possess the required skills but lack the will to properly complete the forms.

We found that surgical records were more promptly documented and there was better utilization of surgical discharge summaries than in other specialties. A higher proportion of

Table 3 Essential documentation by specialties/subspecialties

Ward	% Documented within 24 h	% Patient's name properly documented	% Unit number properly documented	% Principal diagnosis documented in discharge summary	% Investigation orders properly documented	% Discharge summary completed
Accident and emergency	97.9	75.7	58.6	90	71.4	7.69
Medicine	97.4	68.4	68.4	100	84.2	18.42
Obstetrics and gynecology	99.1	80.7	61.9	94.3	91.1	15.77
Pediatrics	98.3	65.7	49.4	88.2	83.1	8.43
Psychiatry	90	80	60	0	40	0
Surgery	100	76.7	70	85.7	86.7	23.33

discharge summaries were correctly completed in medically related records and laboratory investigations were ordered more frequently for maternal cases. However, documentation of pediatric cases was only average, while discharge summaries were not completed at all in psychiatry. In addition, the case notes in patients' health records were not always chronologically arranged and tagged, perhaps due to the fact that file tags were frequently out of stock during the period under review. It is unacceptable that some of the discharged patients' health records were not properly reviewed or coded, as standard practice in disease classification and clinical coding as recommended by WHO²¹ is that the records of every discharged patient should be clinically coded, which is important for determining reimbursement for health-care facilities²² and improves clinical research.

Overall, our findings demonstrate that adherence to documentation standards was suboptimal, especially as regards the entry of unit numbers on progress notes and the non-completion of discharge summaries in most cases. Given the fundamental role of the discharge summary in healthcare transitions, its non-completion is of concern and may impact patient safety.²⁰

Our findings suggest that a periodic hospital-wide comprehensive review of patients' health records in a clinical documentation improvement program²³ would reveal other errors in documentation standards as specified by Kind and Smith.²⁰ Such a review would improve patient care,^{12 24} lead to higher reimbursement,²² and help evaluate the competence of clinicians, clinical support professionals, and other hospital staff.⁶

CONCLUSION AND RECOMMENDATIONS

There were noticeable inadequacies in clinical documentation, especially gross underutilization of the discharge summary. The implementation of a statutory clinical documentation improvement program is necessary to improve data quality in the hospital. Likewise, routine chart review in the admission and discharge unit and the clinical coding and indexing unit of the hospital needs to be strengthened.

In addition, all contributors to patients' medical charts require training in health data quality through the existing hospital continuing education programs and mentoring by senior colleagues.

Major limitations in our study are the lack of specific published work on this topic and the small sample size. More robust data quality improvement studies would be useful in the future.

Acknowledgments The authors wish to thank the three anonymous reviewers of *JAMIA* for their insightful and thoughtful comments on our manuscript.

Contributors ITA: conceived of the study, initiated the design, handled data entry, participated in record selection, chart review, data abstraction, and coordination, analyzed the data, and drafted the manuscript; AAS, OEY, AAA, OOA, LMO, MA, OAA, MWH: participated in study design, record selection, and data abstraction, and revised the manuscript; AOA, KAO, AGO, SAA, SAE, JAJ, ADJ, MEA: participated in study design, data analysis, and coordination, and revised the manuscript; AAS, OEY, MA: participated in record review; AOA: proofread the final manuscript. All authors read and approved the final manuscript.

Competing interests None.

Provenance and peer review Not commissioned; externally peer reviewed.

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