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A Study on the Completeness Level of Inpatient Medical Record Documentation

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ABSTRACT:

Introduction: Medical records are crucial for meeting legal and professional healthcare standards and are key performance indicators for accreditation. Comprehensive records ensure patient identification, diagnosis validation, and support care documentation. Accurate, complete records ensure continuity of care, patient safety, and effective communication among healthcare professionals, while also providing legal protection and aiding in financial, educational, and research purposes.

Materials and Methods: This study examines 640 inpatient records from Shri B M Patil Medical College Hospital, Vijayapura, India, for 6 months of 2023. It evaluates documentation completeness and accreditation compliance in 160 records each from Surgery, Obstetrics and Gynaecology, Orthopaedics, and ENT departments using systematic random sampling and a deficiency checklist. **Results:** Analysis revealed varying completeness in medical records across departments. There was high completeness in OPD Registration and Discharge/Death Summary (98.8%) and Anaesthesia Records (96.3%). Surgery Consent (75.6%) and Investigation Reports (72.5%) showed lower completeness. Essential elements like history sheets, doctor's orders, and nurse's records show 6.3% to 11.9% incompletion.

Conclusion: Accurate medical records are vital for patient care and hospital management, enhancing continuity of care and informed decision-making. Regular audits, staff training, adequate paramedical support, and key performance indicators are essential for maintaining quality. Improving communication and adopting electronic records can further enhance documentation. Findings were shared with hospital administrators.

Keywords: Inpatient Medical Records, Completeness, Documentation, Surgical Allied Departments

1. INTRODUCTION

Medical records documentation (manual or electronic) is an important legal and professional requirement for all health professionals. (Hussein et al., 2018) It is a key performance indicator considered by accreditation bodies worldwide related to delivering healthcare services in the hospital (Helfand & Freeman, 2008). In the era of information and technology, medical records are the most important, the most real, and the richest resource for health and medical information because they are based on medical science facts. (Torki et al., 2015)

A medical record is deemed comprehensive if it includes enough data to identify the patient, validate the diagnosis or condition, support the care, treatment, and services, and record the course and outcomes of the care, treatment, and services. Any written or electronic entry in the medical record needs to be timed, dated, and verified by the individual in charge of delivering or assessing the service. (Centers for Medicare & Medical Services (CMS) Manual System, 2009) having complete and accurate medical records Complete and correctly compiled medical records aim to support continuity of care and patient safety and promote structured and effective communication among healthcare professionals. Since it details every facet of the patient's care, these elements mediate between physicians, patients, and other healthcare providers.

Medical records provide legal protection for patients, healthcare providers, or hospitals when required or when there is a problem. In addition, medical records have a big role in supplying financial purposes, shaping treatment costs, and supporting medical education, healthcare services, and clinical research. (Alfoghi & Ramadan, 2017) Previous research has identified barriers to physicians entering clinical data as coded entries, including time constraints during consultations (Voorhamn & Denig, 2007) and the underappreciation of the usefulness of coded data as a quality indicator. Other reasons include illegible handwriting, inaccuracy, incomplete information, and poor concordance.

This hospital has used accreditation as an effective tool to develop programs for ongoing quality improvement or to provide new leadership for enhancing ongoing quality initiatives. In other words, one way to improve the quality and safety of health-care organisations is through accreditation, which emphasises the continuous improvement of quality and patient and staff safety (Rabiee Seif M et al., 2010). In addition to that, a good number of strategies have been implemented to reduce the deficiencies in medical record documentation with different levels of success. These include audits, case record templates, reminders, educational training programs, and multimodal programs that are also conducted regularly (Lorenzetti et al., 2018; Hayrinen et al., 2008; Le Grand Rogers et al., 2015; Van Deen et al., 2019)

One of the leading causes of incomplete records is that medical professionals, including surgeons, thought that patients needed urgent medical attention or surgical care. However, they do not view the documentation of care-related data as a part of the treatment process. This is a misconception, as the time needed to register and complete patients' medical information is integral to the clinical process. (Tavakoli et al., 2006) This issue may arise in teaching hospitals because of inadequate supervision of data handlers work (Ente et al., 2010). It is wise to remember that (Poor records mean poor defence, and no records mean no defence) (Rangraz et al., 2010)

World Health Organization (WHO) declares that medical records must be clear, concise, complete, correct, consecutive, contemporary, confidential, person-centred, collaborative, and comprehensive to assess documentation quality and, subsequently, assess patient care quality. (Torki et al., 2015) A prior report from the World Health Organization showed that one of the

reasons for medical errors was poor communication among healthcare professionals (Al-Bassam, 2016)

Numerous research has been carried out on the completeness of medical record documents. Even though thorough documentation is crucial for the medical record, many instances of inadequate documentation have been shown. In the study conducted at Mazandaran University, the average data registration in all four sheets was 60%, and the average of registering all the pages in teaching hospitals was 61% and 58% in non-teaching hospitals (Saravi et al., 2016). In William Lodge Study, Overall, 6% of completeness of medical records was found among surgical and obstetric patients with documented SSI and sepsis diagnosis, vitals, inpatient clinical progress, and perioperative documentation indicators, as defined by the research team (Lodge et al., 2020). Gedefa Bayisa's study found that the inpatient department of WURH experienced an improvement in medical record completeness from 53% to 82% at project completion (Bayisa et al., 2024).

2. MATERIALS AND METHODS

Study setting and period:

An institutional-based review of 640 inpatient medical records was done at Shri B M Patil Medical College Hospital and Research Centre, a 1200-bed teaching facility in Vijayapura, Karnataka, India. Every year, the hospital offers health care services to over fifty thousand people and is NABH accredited. This study analysed medical records for a six-month period in 2023 that included 160 cases each from the following departments: Surgery, Obstetrics and Gynaecology, Orthopaedics and ENT. The sample size calculation yielded 630 medical records, with an additional 10 records included, a total of 640. This retrospective cross-sectional study aims to review the documentation process for patient files as per the National Standards of Accreditation.

Sample Size Calculation:

With an anticipated Proportion of completeness in medical records of 18% (Relationship of Accreditation Status with Completeness of Medical Record Documents for Inpatients at the Hospital) (Lestari et al., 2021), the study requires a sample size of 630 with a 95**%** level of confidence and 3% absolute precision**.**

Formula used

$$n=\frac{z^2\ p*q}{d^2}$$

Where Z= Z statistic at α level of significance

d= Absolute error

P= Proportion rate

q= 100-p

Statistical Analysis

- The data obtained will be entered into a Microsoft Excel sheet, and statistical analysis will be performed using a statistical package for the social sciences (SPSS Version 20).
- Results will be presented as Mean ±SD/Median and Inter quartile range, counts, percentages, and diagrams.

Methods of data collection

All patients discharged during the study period were selected through systematic random sampling. Specifically, every 25th case paper of a discharged patient was included in the study. This was determined by dividing number of surgical cases in half year, approximately 16000, by the sample size of 640, resulting in 25. Each selected case paper was thoroughly

assessed to ensure completeness and compliance with national and international accreditation standards.

Study tool: Data extraction was performed using a deficiency checklist developed by the researcher and confirmed by the professor, adhering to standards set by national and international accreditation agencies. This checklist encompassed 13 components crucial for comprehensive patient assessment, expressed in complete/incomplete. These components included: OPD registration form**,** Discharge/Death summary and date**,** Final diagnosis**,** Unit chief seal and signature**,** History sheet**,** Doctor's orders**,** Nurse's daily records**,** TPR (Temperature, Pulse, Respiration) records**,** Surgery consent**,** Anaesthesia consent**,** Anaesthesia records**,** Operation records**,** Investigation reports. The overall completeness was fixed at, >90% - "High Completeness", 80% - 89% - "Moderate Completeness", <79% - Low Completeness".

Inclusion Criteria: Inpatient case sheets from the surgical and allied departments (Surgery, Obstetrics and Gynaecology, Orthopaedics, ENT) were included in the study.

Exclusion Criteria: OPD and Inpatient case sheets from departments other than surgical and allied departments were excluded.

3. RESULTS

Four surgical departments were evaluated on the degree of completeness of several documentation parameters. The results of the study are presented in the provided table. The Chi-Square test was used to assess the statistical significance of the differences in the completeness levels across the four departments.

Table 1: Department-wise distribution of completeness of inpatient medical record documentation

		DEPARTMENTS									
Documentation Parameter	**Completeness Level**	**OBG**		**General Surgery**		**Orthopedics**		**ENT**		**Chi-Square Test**	**Significance Value**
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**		
OPD Registration Form	Complete	158	98.8	157	98.1	158	98.8	157	98.1	0.406	P=0.939
	Incomplete	2	1.3	3	1.9	2	1.3	3	1.9		
Discharge/Death Summary Date	Complete	158	98.8	158	98.8	157	98.1	158	98.8	0.338	P=0.953
	Incomplete	2	1.3	2	1.3	3	1.9	2	1.3		
Final Diagnosis	Complete	134	83.8	144	90.0	137	85.6	126	78.8	7.970	P=0.047
	Incomplete	26	16.3	16	10.0	23	14.4	34	21.3		
Unit Chief Sign & Seal	Complete	143	89.4	137	85.6	150	93.8	148	92.5	7.215	P=0.065
	Incomplete	17	10.6	23	14.4	10	6.3	12	7.5		

History Sheet	Complete	149	93.1	143	89.4	142	88.8	130	81.3	11.348	P=0.010
	Incomplete	11	6.9	17	10.6	18	11.3	30	18.8		
Doctor's Order	Complete	153	95.6	147	91.9	148	92.5	152	95.0	2.773	P=0.428
	Incomplete	7	4.4	13	8.1	12	7.5	8	5.0		
Nurse's Daily Records	Complete	141	88.1	145	90.6	147	91.9	151	94.4	4.070	P=0.254
	Incomplete	19	11.9	15	9.4	13	8.1	9	5.6		
T.P.R Chart	Complete	139	86.9	143	89.4	134	83.8	133	83.1	3.318	P=0.345
	Incomplete	21	13.1	17	10.6	26	16.3	27	16.9		
Surgery Consent	Complete	126	78.8	125	78.1	121	75.6	151	94.4	23.460	P=0.001
	Incomplete	34	21.3	35	21.9	39	24.4	9	5.6		
Anesthesia Consent	Complete	125	78.1	131	81.9	141	88.1	144	90.0	11.125	P=0.822
	Incomplete	35	21.9	29	18.1	19	11.9	16	10.0		
Anesthesia Records	Complete	151	94.4	151	94.4	153	95.6	154	96.3	0.915	P=0.822
	Incomplete	9	5.6	9	5.6	7	4.4	6	3.8		
Operation Records	Complete	148	92.5	140	87.5	145	90.6	146	91.3	2.519	P=0.472
	Incomplete	12	7.5	20	12.5	15	9.4	14	8.8		
Investigation Reports	Complete	126	78.8	119	74.4	116	72.5	117	73.1	2.017	P=0.569
	Incomplete	34	21.3	41	25.6	44	27.5	43	26.9		

The examination of medical records revealed significant variations in completeness across different departments. High completeness, exceeding 90%, was observed in the OPD Registration Form (98.1% - 98.8%), Discharge/Death Summary Date (98.1% - 98.8%), doctor orders (91.9% - 95.6%), and Anaesthesia Records (94.4% - 96.3%). No statistically significant differences were found in these components across all departments. In nursing daily records, all departments achieved high completeness rates between 90% and 94.4%, except for the OBG department, which had a moderate completeness rate of 88.1%. Similarly, operation records showed high completeness rates between 90.6% and 92.5% in all departments, except for general surgery, which had a moderate completeness rate of 87.5%, with no significant differences observed.

High completeness levels were also noted in the final diagnosis for surgery (90%). In comparison, the OBG and orthopaedics departments had moderate completeness levels of 83.8% and 85.6%, respectively, and the ENT department had a low completeness level of 78.8%, showing a statistically significant difference. The completeness of unit chief

signatures and seals was high in orthopaedics (93.8%) and ENT (92.5%) and moderate in OBG (89.4%) and surgery (85.6%), with no significant statistical differences observed.

In the history sheet, the OBG had a high completeness rate of 93.1%, while all other departments had moderate completeness rates ranging from 81.3% to 89.4%, showing a statistically significant difference. Moderate completeness was observed in the TPR chart, with rates ranging from 83.1% to 89.4% across all departments, with no statistically significant differences.

For surgery consent, ENT achieved high completeness at 94.4%, while all other departments demonstrated low completeness levels ranging from 75.6% to 78.8%, showing statistically significant differences. High completeness was also noted in anaesthesia consent for the ENT (90%), moderate completeness in surgery (81.9%) and orthopaedics (88.1%), and low completeness in OBG (78.1%), with no statistically significant differences.

A low level of completeness was observed in investigation reports, ranging from 72.5% to 78.8% across all departments, with no statistically significant differences noted.

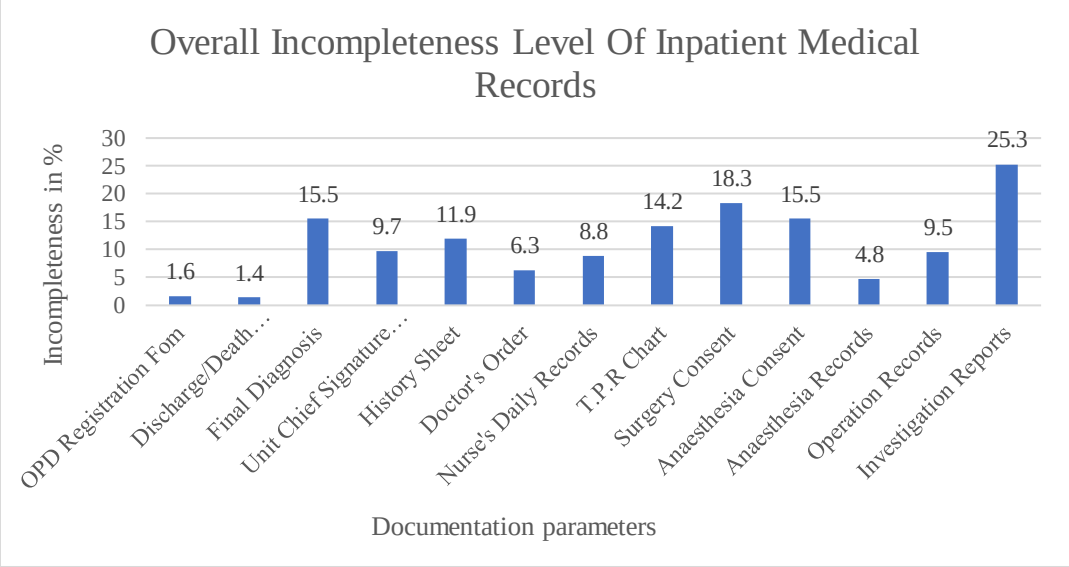

Figure 1: Overall distribution of incompleteness of inpatient medical record documentation

The analysis of the incompleteness levels of medical records across various documentation parameters is illustrated in the graph. The graph represents the percentage of incomplete records for each parameter, highlighting areas where documentation practices need improvement.

Further down the line, the final diagnosis, a vital component of the medical record, exhibits a concerning incomplete rate of 15.5%. The absence of a unit chief's signature and seal, at 9.7%, undermines the authenticity and legitimacy of the documentation. The history sheet, doctor's orders, and nurse's daily records, all essential elements of patient care, exhibit incomplete rates ranging from 6.3% to 11.9%.

The consequences of these incomplete documentation parameters extend beyond the immediate patient encounter. The T.P.R. chart, which tracks vital signs, has a 14.2% incomplete rate, potentially hindering the early detection of healthcare issues. The surgery and anaesthesia consent forms, with incomplete rates of 18.3% and 15.5%, respectively, raise concerns about the informed decision-making process and patient safety.

The anaesthesia and operation records, crucial for ensuring the quality of surgical interventions, exhibit incomplete rates of 4.8% and 9.5%, respectively and the investigation reports, which provide the foundation for accurate diagnosis and treatment, have the highest incomplete rate at 25.3%.

Discussion

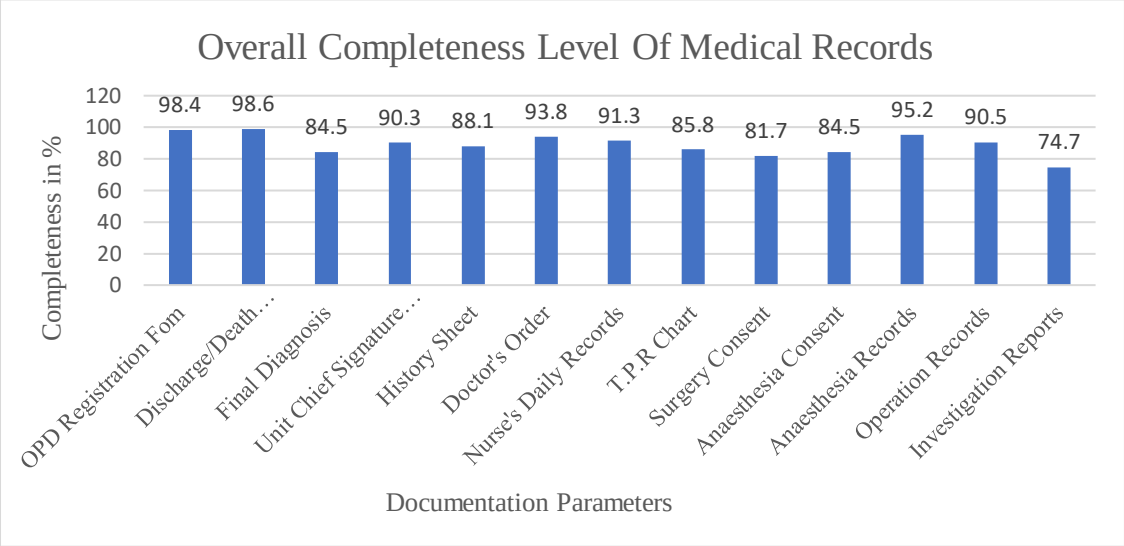

Figure 2: Overall distribution of completeness of inpatient medical record documentation

The completeness of medical records is critical in ensuring high-quality patient care, accurate clinical decision-making, and effective healthcare management. Several assessments protocol was used in the completeness assessment of patient's medical records, but most studies go through restricted records or special diseases. This study evaluated the incompleteness levels of various documentation parameters across four surgical departments and found significant variations. The findings are consistent with previous research, highlighting the need for continuous improvement in medical documentation practices.

Our results on the high completeness rates of OPD registration forms are consistent with earlier studies, emphasising the significance of comprehensive patient identifying information, such as name, date of birth, gender, and admission date, for determining ownership of the form (Hadyan & Nadjib, 2022). The discharge summary is often the sole means of contact for general practitioners and rehabilitation programmes. Since summaries contain crucial information such as the patient's identity, primary and final diagnosis, treatment results, and discharge status, they should be done correctly to avoid major mismanagement and communication breakdowns (Shepperd et al., 2009).

Regarding the recording of critical medical record components, such as final diagnosis, this study's completeness rate of 84.5% closely aligns with the moderate range (70 - 79%) reported in Aryaei's and Abbassi's research (Babai, Salavati, 2007; Shirin & Nahid, 2011). Implementing a defect-eliminating form and conducting quantitative analysis have been effective in enhancing the overall completeness of these records (Torki et al., 2015)

The South Jakarta study was similar to our result, as 95.4% of the unit chief's signature and seal were complete. In contrast, our study is very thorough and achieves 90.3% in completeness; this study indicates that the status of the signature and name on the medical record form is the authentication element for validity and integrity (Hadyan & Nadjib, 2022).

In Northern Tanzania, the study highlights that patient history sheets were 76% complete in a survey, but secondary data quality checks and report cards may have contributed as key indicators (William Lodge II et al., 2020). Although our investigation found a completion rate of 88.1%. The findings highlighted the need for ongoing performance monitoring and feedback linked to recommendations that support good record-keeping practices in healthcare.

The study results show a completion rate of doctor's orders of around 93.7%. An earlier audit in Wallaga University Referral Hospital noted up to 84% - 100% of physician notes. This was implemented using a Plan-Do-Study-Act method incorporating supportive supervision, standardized formats, orientation programmes, chart audit teams and data ownership assignments (Bayisa et al., 2024).

Research conducted in a Brazilian university hospital showed that complete documentation of all nursing records was found in only 82%. As per our results, 91.2% with a relatively high completeness rate. These findings indicate an effort to improve the quality of medical record documentation (Borsato et al., 2011).

A study from New South Wales, Australia, identified that incomplete documentation of vital signs might result in delayed recognition of patient deterioration (Cardona-Morrell et al., 2016). According to our research, the TPR chart recorded vital signs with 85.8%, which emphasises the need for improved monitoring techniques.

Consent forms for surgery and anaesthesia represent morally and legally sound patient care. These documents, which should be filled out by the patient, physician, and witness, must unambiguously include all pertinent information regarding the medical process (Hadyan & Nadjib, 2022). According to an audit conducted in Italy (Azzolini et al., 2019), the completion rate for surgery consent forms was 77.7%, consistent with our finding that more than 80% were completed.

The anaesthetic record has several functions in the perioperative management of anaesthesia, including; research, medico-legal issues and ensuring safe practice (Raff & James, 2003) The same was found during the report done at Munini Hospital in Rwanda whereby 91 –96%; $p<0.275$ were all; completeness level of pre-operative anaesthesia record form increased (Ufitinema et al., 2016) Accordingly, as evident from our research that shows the completeness of 95.2%, this is in line with the current study. Results showed that implementing electronic medical records can lead to better recording (Jang et al., 2013). In the 2014 Royal College of Surgeons study, improvement in surgical documentation was assessed against the Good Surgical Practice guidelines. Good quality operation notes are vital for patient care and medico-legal issues. This study achieved a 90.5 % completeness level, which shows that simple interventions can significantly improve clinical practice (Parwaiz et al., 2017). Such incomplete documentation undermines any efforts to analyze and learn from previous procedures, depriving us of the capability for continual improvement in healthcare practices.

Regular review, training, and incentive mechanisms were shown to explain the lowest documentation errors in a study conducted in Iran on laboratory testing, which had an incompleteness rate of 20.64% (Tabesh et al., 2022). This percentage is 25.3% in our study, which is significantly higher. This concerning statistic emphasises how urgently the gaps in the documentation of crucial healthcare information must be filled.

4. Conclusion

Medical records are the solution to better patient care and hospital management. They contain information the hospital needs or wants to know for continuity of care and communication between health professionals about a patient. Moreover, these records can provide data for facility-level quality improvement and decision-making.

The study reported that regular audits, training and orientation of health staff on good medical record practice are required as these impact the quality of medical records. There should also be enough paramedical personnel for proper documentation work. By the same notion, if KPIs were implemented, it could even enable data-driven decision-making. For

example, our electronic medical records could further enhance clinical documentation, and we might use internal quality control as a departmental performance metric.
For hospital management, accountability, medical research, etc., it is very important that healthcare professionals address their lack of communication or understanding well to maintain the complete record so far. Findings from the audit are reviewed by the administration, ward supervisors and medical record officers.

Ethical Considerations
Ethical clearance and approval for this study were obtained from the BLDE (Deemed to be University) Ethical Review Committee with reference number BLDE (DU)/IEC/ 806/2022-23. The confidentiality of patient information was strictly maintained throughout the study period.

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Declaration of competing interest
The authors declare no conflicts of interest.

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