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Research and Evidence on Knowledge in Administration and Management — Medical Electronic Data and Information Systems

Relationship of Completeness of Filling Out a Medical Resume with Accuracy of Secondary Diagnosis Codes of Surgical Inpatients

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ABSTRACT
Coding is an important part of medical records management, significantly affecting reporting accuracy and insurance claim. It was found that incomplete filling of medical resumes by medical personnel caused inaccuracies, especially in secondary diagnosis coding. This study aims to examine the relationship between the completeness of the filling of medical resumes with the accuracy of the secondary diagnosis code in the medical record of surgical hospitalization. Using a descriptive quantitative analytical approach, data were collected through observation of 84 medical records. The observation table served as a research instrument, with the data analyzed by the bivariate method, and The chi-square was used for statistical testing. Results showed 29 records (34.5%) had incomplete medical resumes, while 35 records (41.7%) contained inaccuracies in secondary diagnosis coding. Statistical analysis confirmed a significant relationship between the completeness of medical resumes and the accuracy of secondary diagnosis codes (p = 0.000). These findings suggest that incomplete resume filling negatively affects the quality of secondary diagnosis coding, compromising the validity of medical record data and hospital administrative processes. The study concludes that medical personnel must ensure complete filling of medical resumes to improve coding accuracy and enhance overall hospital record quality.

Keyword : *Coding, Secondary Diagnosis, Medical Resume, Accuracy*

INTRODUCTION

Based on the Regulation of the Minister of Health of the Republic of Indonesia Number 24 of 2022, health care facilities are defined as any device and/or place used to provide health services, which include promotive, preventive, curative, and rehabilitative efforts, organized by the government, regional governments, and/or the community. A hospital, as stipulated in the Regulation of the Minister of Health Number 3 of 2020, is a health service institution that provides comprehensive individual health care services, including inpatient, outpatient, and emergency care. Within the hospital, the Medical Record Unit functions as one of the supporting units that contributes to the implementation of these health service functions.

According to the regulation of the Minister of health of the Republic of Indonesia number 269/Menkes/Per/III/2008 concerning medical records, medical records are defined as documents containing patient identity data, examinations, treatments, procedures, and other services provided to patients. These documents represent the result of all processes that the patient experiences and acquires during treatment in a health facility. The creation and completion of medical records must be completed immediately after the patient receives medical services. Incomplete medical records may result in errors or inaccuracies in the coding process.

The Decree of the Minister of Health Number HK.01.07/MENKES/312/2020 outlines one of the core competencies required of medical record officers—namely, the ability to determine clinical classifications, code diseases and related health problems, as well as clinical procedures according to the classification system applied in Indonesia. This process adheres to the ICD-10 (*International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*) and ICD-9 CM (*International Classification of Procedures*), which are used for disease statistics and health facility financing systems. Therefore, medical record officers bear a significant responsibility in ensuring the accuracy and precision of diagnosis coding as determined by the attending physician (Minister of Health Number HK.01.07/MENKES/312/2020).

According to the regulation of the Minister of health of the Republic of Indonesia number 24 of 2022 concerning medical records, the task of the medical records unit is to manage documents containing a person's health information through a series of organized activities. These documents include medical records, laboratory test results, medical history, and related materials. Good management of medical records requires clear standards as stipulated in this regulation. One of the main principles outlined in the regulation is the completeness of the documentation of medical records. A complete and well-organized medical record will facilitate the treatment process and support appropriate medical decision making. In addition, the completeness and security of medical record data is also very important to maintain the confidentiality of patient information in accordance with applicable legislation.

The completeness of medical information on each medical record form plays a crucial role in determining accurate diagnostic codes, in accordance with the diagnoses established by physicians. This aligns with Hatta's statement that complete medical record documentation by

health workers facilitates other health professionals in providing appropriate treatments or therapies. Furthermore, comprehensive medical record data serve as a valuable source of information for management in determining strategic steps for the development of health services. Conversely, incomplete medical summaries or medical information can affect the accuracy of coding and hinder the work of coders (Cecilia Widijati, 2022).

A medical summary contains information regarding a patient's medical history, physician-established diagnoses, treatments received, and the results of examinations or tests performed. This document may also include current medical conditions and medications prescribed to the patient. The primary function of a medical summary is to assist doctors or other healthcare professionals in determining an appropriate treatment plan, with diagnosis establishment being the most essential element (Ministry of Health Decree of the Republic of Indonesia, 2008).

Coding is the activity of assigning letters and/or numbers that represent data components, which must adhere to the ICD-10 standard. The accuracy and precision of diagnostic codes are based on the disease classification codes contained in ICD-10. A code is considered accurate and appropriate if it corresponds to the patient's condition and follows all applicable classification rules (Ferdianto & Lutfiati, 2021).

Diagnostic coding accuracy refers to the precision in using codes to describe medical diagnoses. This aspect is highly important because these codes are used to document and claim healthcare services that have been provided. The accuracy of diagnostic coding is also vital for health data management and clinical decision-making. To ensure its accuracy, standardized procedures are required for determining diagnostic codes. In addition to identifying the primary diagnosis code, coders must also pay attention to secondary diagnosis codes (Rahayu et al., 2022; Pardede, 2020).

Secondary diagnosis coding is the process of recording or assigning ICD-10 codes to additional diagnoses identified during a patient's treatment or evaluation. These secondary diagnoses represent additional conditions that may not be directly related to the primary cause of the patient's health problem but remain important to report and consider in the patient's overall management. For secondary diagnosis codes, physicians or other healthcare professionals are required to assign the appropriate ICD-10 code for each additional diagnosis identified (World Health Organization. (2019).

The rationale behind the inclusion of secondary diagnosis codes is to ensure that all relevant diagnoses are accurately recorded and can be utilized for patient health management, as well as for planning and implementing health programs. Assigning ICD-10 codes to secondary diagnoses also helps classify and organize medical data systematically, thereby facilitating analysis and comparison of medical information. Furthermore, secondary diagnosis codes play an important role in improving the accuracy and reliability of medical data collected for medical research and healthcare performance evaluation. In the INA-CBG's system, there is a concept of *severity levels*, which are influenced by secondary diagnoses. Therefore, secondary diagnosis

coding becomes a vital component in the overall health data coding process (Ministry of Health Decree of the Republic of Indonesia, 2016).

Casemix (case-based payment) is a prospective payment method implemented since 2008 as a reimbursement system for the Community Health Insurance Program (*Jaminan Kesehatan Masyarakat* or *Jamkesmas*). The casemix system groups diagnoses and procedures based on similarities in clinical features and resource or treatment costs, with this grouping process carried out using a grouper software. In Indonesia, the casemix system has undergone three tariff adjustments: the INA-DRG tariff in 2008, the INA-CBG's tariff in 2013, and the revised INA-CBG's tariff in 2014 (Amalia, 2020).

According to a study by Ririn Rahayu on the accuracy of diagnosis coding in inpatient surgical cases at RSKD Duren Sawit, it was found that, from the sample studied, 58 codes (63.74%) were accurate and 33 codes (36.26%) were inaccurate. Additionally, for secondary diagnosis coding accuracy, 84 codes (92.30%) were accurate, while 7 codes (7.70%) were inaccurate (Rahayu et al., 2022).

Another study conducted by Cecilia Widijati Imam on the completeness of medical summaries and the accuracy of diagnosis coding in perinatal cases at Panti Waluya General Hospital, Malang, revealed a significant relationship between the completeness of medical summaries and the accuracy of diagnosis coding for delivery cases. Using 44 medical record samples, the study found that medical summary completeness was categorized into three levels: 12 complete files, 23 fairly complete files, and 9 incomplete files. For the accuracy of perinatal diagnosis coding, 7 files were accurate, 31 were fairly accurate, and 6 were inaccurate. These findings indicate that the completeness of medical summaries strongly influences the accuracy of diagnosis coding in perinatal cases. The more complete the medical information recorded in the medical summary form, the more accurate the resulting perinatal diagnosis coding will be (Cecilia Widijati, 2022).

METHODS

This study used a quantitative approach using descriptive analysis methods to identify the relationship between the completeness of medical summary documentation and the accuracy of coding secondary diagnoses. The study was conducted in 2024 at the Central Hospital of Dr. M. Djamil Padang with the study population includes all cases of postoperative hospitalization in Central Hospital Dr. M. Djamil Padang, with a sample of 84 medical records selected through accidental sampling. This sampling technique is based on the availability of subjects who meet the research criteria during the data collection period.

Data were collected through direct observation of the contents of the medical records using an observation checklist as the primary instrument. The data analysis techniques used include univariate analysis to describe the frequency distribution of each variable, and bivariate analysis using the chi-square test to identify the relationship between the two main variables in the study.

This methodological approach enables the researcher to obtain an accurate quantitative overview of the pattern of medical summary completion and its conformity with the secondary diagnosis coding process.

RESULTS

1. Completeness of Filling Out a Medical Resume

Based on the results of observations through the observation table that researchers conducted on 84 medical records of patients discharged from surgical inpatient installations, the percentage of completeness of filling out medical resumes obtained can be seen in the following table:

Table 1. Frequency Distribution of Completeness of Filling Out a Medical Resume Patient Goes Home Inpatient Surgical Installation

Completeness of the Medical Resume	*f*	%
Complete	55	65,5
Incomplete	29	34,5
Total	84	100,0

Based on Table 1. showed that out of 84 medical records of patients discharged from surgical inpatient facilities, researchers found more than half of 55 (65.5%) medical records with complete medical resumes and found less than half of 29 (34.5%) medical records with incomplete medical resumes.

2. Secondary Diagnosis Code Accuracy

Based on the results of observations through the observation table that the researchers conducted on 84 medical records of patients discharged from surgical inpatient installations, the percentage of accuracy of the secondary diagnosis code obtained can be seen in the following table:

Table 2. Secondary Diagnosis Code Precision Frequency Distribution Patient Goes Home Inpatient Surgical Installation

Secondary Diagnosis Code Accuracy	*f*	%
Exact	49	58,3
Not Exactly	35	41,7
Total	84	100,0

Based on Table 2 shows that from 84 medical records of patients discharged from surgical inpatient facilities, researchers found more than half of 49 (58.3%) medical resumes with appropriate secondary diagnosis codes while medical resumes with inappropriate diagnosis codes were less than half of 35 (41.7%).

3. Relationship of Completeness of Filling Out a Medical Resume with Accuracy of Secondary Diagnosis Codes

Based on the results of observations through the observation table that the researchers conducted on 84 medical records of patients discharged from surgical inpatient installations, the percentage results obtained between the completeness of the medical resume and the accuracy of the secondary diagnosis code can be seen in the following table:

Table 3. Relationship of Completeness of Filling Out a Medical Resume with Accuracy of Secondary Diagnosis Codes

Completeness of the Medical Resume	Secondary Diagnosis Code Accuracy				P value
	Exactly		Not Exactly		
	f	%	*f*	%	
Complete	46	83,6	9	16,4	0,000
Incomplete	3	10,3	26	89,7	
Total	49	58,3	35	41,7	

Based on Table 3. above, it was found that the secondary diagnosis code that is not right is more common in incomplete medical resumes as much as 26 (89.7%) compared to complete medical resumes as much as 9 (16.4%). Statistically obtained p value = 0.000 where there is a relationship between the completeness of the medical resume with the accuracy of the secondary diagnosis code.

DISCUSSION

1. Completeness of the Patient's Medical Resume at Home Surgical Inpatient Installation at Dr. M. Djamil Padang

Based on the results of the study involving 84 postoperative inpatient medical records, it was identified that 29 (34.5%) of the medical summary documents did not meet the completeness criteria. This finding aligns with Pardede's (2020) research on the completeness of medical summaries and the accuracy of diagnosis codes for BPJS inpatient claims at Dr. M. Djamil Central General Hospital Padang, where among 20 medical summaries reviewed, various aspects were found to be incomplete: 2 summaries lacked anamnesis information, 3 lacked physical examination data, 7 lacked diagnostic and laboratory results, 5 lacked documentation of diagnostic/therapeutic procedures, and 3 lacked medication administration records during treatment.

The results of such studies are partly due to the fact that the completion of medical summaries is not always carried out directly by specialist doctors but is often delegated to Resident Doctors. Other contributing factors include lack of knowledge and compliance among physicians in completing medical records, suboptimal understanding of ICD-10 coding among coders, limited awareness of Minister of Health Regulation No. 76 of 2016, and ineffective communication between coders and doctors.

The medical summary, as a condensed record of patient care, plays a crucial role as it contains information on diagnoses and both medical and non-medical interventions during treatment. This information forms the basis for determining disease and procedure codes according to ICD-9-CM and ICD-10 coding guidelines, which are then used to establish INA-CBG's tariff classifications and severity levels (Hapsari et al., 2020).

The responsibility for ensuring the completeness of medical summaries lies primarily with healthcare providers, particularly physicians. Non-compliance in completing documentation may lead to discrepancies in determining severity levels. Incomplete or unclear diagnostic entries can result in *undercoding*, where the diagnosis coding does not accurately reflect the appropriate INA-CBG's tariff classification (Hapsari et al., 2020).

Completeness in documenting diagnoses and procedures within medical summaries serves as the foundation for accurate coding, cost calculation, and severity level grouping. Therefore, improvements are needed in the preparation of medical summaries, particularly to ensure consistency between diagnostic documentation and supporting examinations based on clinical pathways and clinical guidelines. The completeness of each aspect within the medical summary not only supports insurance claims but also contributes to hospital reporting and medical research (Hapsari et al., 2020).

In addition, the study also noted inaccuracies among coders in reviewing and translating medical summaries into diagnosis codes. In some cases, even though a secondary diagnosis has been documented by a doctor, the coder fails to establish the appropriate code. In other cases, on the contrary, coding difficulties arise as a result of incomplete or ambiguous information in the medical summary. These findings are in line with various recent studies showing that medical coding error rates are still high in various countries. Other factors that affect coding inaccuracies include incompleteness of medical documentation, high workload, low experience of coders, as well as weak internal quality control processes. Several studies have also highlighted the effectiveness of the implementation of the quality control circle (QCC) which is able to significantly reduce the coding error rate (Alshahrani, A., 2024; Pratiwi, D. N., & Ramadhani, L. (2023).

In addition, technological developments such as the use of Natural Language Processing (NLP) and artificial intelligence (AI) began to be used to assist the coding process and proved to be able to reduce the error rate to below 2%. However, recent research confirms that this technology is not yet able to completely replace the role of humans, as it still requires a clinical verification process to ensure the accuracy of the code. Therefore, communication and coordination between health care providers and medical records officers needs to be strengthened, accompanied by an increase in coder competence, the implementation of clear sops, and the use of integrated and regularly supervised technology to ensure the coding process is carried out accurately and comprehensively *(Liu et al., 2024).*

Based on the analysis, the researcher found that the completeness of medical summary documentation by healthcare professionals remains suboptimal. The section most frequently left incomplete is the diagnosis field, especially for secondary diagnoses. This incompleteness includes non-specific diagnoses, the use of non-standard medical terminology, or the complete absence of secondary diagnosis entries. Such conditions directly impact the coding process, as coders lack sufficient information to assign accurate diagnosis codes in accordance with coding standards.

2. Accuracy of the Secondary Diagnosis Code on the Medical Resume of the Patient Going Home Surgical Inpatient Installation

The results obtained by the researchers showed that from 84 medical records of patients discharged from surgical inpatient installations, researchers found 35 (41.7%) medical records that were not appropriate secondary diagnosis codes.

This research is in line with the research of Setiyoargo et al., (2022) entitled "completeness of the medical Resume and accuracy of the diagnostic code for childbirth cases" it is known that the inaccuracy of the diagnostic code for childbirth cases is 57% because it is caused by the coder not providing a secondary code as a form of additional information related to the type of birth that occurred. Based on the results of the study, the accuracy of the diagnosis code of childbirth cases in medical records there are 6 medical record files with accurate categories, 31 medical record files with fairly accurate categories and 7 Medical Record files with inaccurate categories. Accuracy in the provision of diagnostic codes is something that must be considered by medical recorders, the accuracy of diagnostic data is very important in the management of clinical data management, reimbursement, along with other matters related to care and health services (Setiyoargo et al., 2022).

The results of this study are in line with the research of Rahayu et al., (2022) entitled "Review of the accuracy of Diagnosis codes in inpatient surgery cases at Duren sawit RSKD" based on 91 inpatient surgery cases in October - December 2021, 58 main diagnosis codes were found in medical records that had accuracy with a percentage of (63.74%) and 33 main diagnosis codes were found in medical records that had less precise codes with a percentage of (36.26%). While in the secondary diagnosis code found as many as 84 (92.30%) the right diagnosis code (Rahayu et al., 2022).

It was found that the inaccuracy of the secondary diagnosis code as many as 7 medical records was caused by the provision of a less appropriate code in the 4th character. Obstacles contained in the implementation of disease codefication based on 5m elements (Man, Money, Machine, Method, Material) obtained 1 factor that becomes an obstacle, namely :Man Factor (human) lack of thoroughness of doctors in choosing the appropriate code with a given diagnosis. The lack of accuracy of the coding staff in re-examining the diagnosis is less accurate in the diagnosis. Coding officer is not a graduate of the Academy of medical records (Rahayu et al., 2022)It was found that the inaccuracy of the secondary diagnosis code as many as 7 medical

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Accuracy and accuracy in the provision of diagnosis code is something that must be considered by medical recorders, the accuracy of diagnosis data is very important in the management of clinical data management, reimbursement of costs (reimbursement), along with other matters related to care and health services. The way to obtain a precise and accurate diagnosis code is to pay attention to information that supports or other causes that affect the main or secondary diagnosis code (Widijati, 2022).

Improper and accuImproper and accurate diagnosis codes will have an impact on several things including health insurance systems, health education and research, health statistics, hospital quality, hospital reporting and hospital accreditation. An inaccurate diagnosis code will affect the patient's health insurance if it concerns other conditions of the patient accompanied by complications and comorbidities. If a condition of complications and comorbidities is not completely recorded in the medical resume will cause data errors in a study. In the implementation of hospital accreditation, it will also reduce the value of accreditation because the data displayed related to hospital reports is also inaccurate and irrelevant. This is in accordance with the statement of previous research that the purpose of coding one of them is to provide diagnosis and action information for research, education and assessment of output quality.

3. Relationship of Completeness of Filling Out a Medical Resume with Accuracy of Secondary Diagnosis Codes

The results of this study show that out of 84 postoperative inpatient medical records, 35 (41.7%) were found to have inaccurate secondary diagnosis codes. This finding is consistent with the study on the completeness of medical summaries and the accuracy of delivery diagnosis codes, in which 57% of diagnosis codes were inaccurate because coders failed to assign secondary codes that provided additional information regarding the type of delivery. The study revealed that, out of all samples, only six medical records contained accurate codes, 31 were categorized as moderately accurate, and seven were categorized as inaccurate (Setiyoargo et al, 2022).

Accuracy in assigning diagnosis codes is a crucial aspect that must be emphasized by medical record officers, as the precision of diagnostic data is vital for clinical data management, cost reimbursement, and other aspects related to healthcare services. This finding is further supported by Rahayu et al. (2022), who analyzed 91 inpatient surgical cases and found that 58 primary diagnosis codes (63.74%) were accurate, while 33 codes (36.26%) were inaccurate. For

secondary diagnoses, 84 codes (92.30%) were recorded as accurate. Further analysis revealed that inaccuracies in secondary diagnosis codes in seven medical records were caused by errors in assigning the fourth character of the code. Based on the 5M approach (Man, Money, Machine, Method, Material) used to identify inhibiting factors, the human factor emerged as the main issue. This includes physicians' lack of attention in selecting appropriate codes for diagnoses, coders' lack of accuracy in reviewing diagnostic information, and the fact that some coding staff did not have an educational background in medical record management (Rahayu et al., 2022).

Achieving accurate and appropriate diagnosis coding requires careful attention to supporting information or other factors influencing both primary and secondary diagnosis codes. Inaccurate diagnosis codes can have a wide range of implications for health insurance systems, medical education and research, health statistics, hospital quality, hospital reporting, and accreditation. Inaccurate coding may affect patients' health insurance claims, especially in cases involving complications and comorbidities. Incomplete documentation of such conditions in medical summaries can result in data inaccuracies for research purposes. In the context of hospital accreditation, this can lower accreditation scores due to inaccurate and unreliable data presented in hospital reports. These findings are consistent with previous studies stating that one of the main purposes of coding is to provide diagnostic and procedural information for research, education, and quality assessment (Widijati, 2022).

CONCLUSIONS

Based on the research conducted, a number of important findings were obtained. Researchers identified 29 records (34.5%) with incomplete medical summaries, and 35 records (41.7%) were found to contain inaccuracies in the coding of secondary diagnoses. Statistical analysis using the Chi-Square test indicated a significant correlation between the completeness of the medical summary and the accuracy of secondary diagnosis coding ($p = 0.000$). These results show that thorough clinical documentation has a direct impact on coding accuracy; therefore, quality improvement initiatives should prioritize enhancing the quality of clinical documentation by healthcare providers as well as improving the accuracy of coding professionals in interpreting the available information.

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