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THE RELATIONSHIP BETWEEN ACCURACY OF MEDICAL TERMINOLOGY DOCUMENTATION AND DIAGNOSIS CODE ACCURACY IN OBSTETRIC CASES AT RSIA PURI MALANG

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ABSTRACT

The Accurate medical documentation and diagnostic coding are essential components of healthcare services, directly influencing the quality of patient care, health data reporting, and hospital reimbursement systems. Therefore, this study aims to identify the relationship between the accuracy of medical terminology documentation and diagnosis code accuracy, providing insights for improvement in coding systems at hospitals. This study uses a quantitative, cross-sectional approach to examine the relationship between the accuracy of medical terminology documentation and diagnosis coding in Obstetric cases. The research was conducted in 2024 at RSIA Puri Malang. Data were collected from 300 medical records through simple random sampling. Descriptive statistics were used to analyze the accuracy of documentation and coding, followed by a chi-square test to assess the correlation between medical terminology accuracy and diagnosis coding precision. The study shows a statistically significant relationship between the accuracy of medical terminology documentation and diagnosis coding accuracy in Obstetric cases, with a p-value of 0.048. Since the p-value is less than the significance level of 0.05, this indicates that the observed relationship is unlikely to be due to chance, supporting the hypothesis that accurate medical terminology documentation positively impacts the precision of diagnosis coding. The findings suggest that improving the quality of documentation can lead to more accurate coding, which is crucial for effective healthcare delivery, billing processes, and insurance claims.

Keywords: Medical Terminology Accuracy, Diagnosis Coding Precision, Healthcare Documentation, Obstetric Cases

INTRODUCTION

High-quality and standardized healthcare services have become a requirement in providing services to the public. Medical records play an essential role as a source of information containing data related to patient conditions, medical history, treatments, and diagnoses. A quality healthcare system requires accurate and reliable data, which serves as the basis for various aspects such as decision-making, research, education, and healthcare

financing. One of the important data sources in the healthcare system is the medical record, which contains information about the patient's medical history, diagnosis, treatment, and other medical procedures. According to the Minister of Health Regulation Number 24 of 2022, a medical record is a document that contains patient identity data, examination results, treatments, procedures, and other services provided to the patient.[1]

The completeness of medical record documentation is crucial, as it contains essential information, particularly the diagnosis. Managing medical record data requires professional personnel, and one important aspect of medical record management is the coding of patient diagnoses. Diagnosis coding must be performed by medical record staff with the competence related to disease classification and codification, in accordance with the Minister of Health Regulation Number 55 of 2013 on the Standard Competencies for Medical Records and Health Information Professionals.[2]

The regulation states that in carrying out their duties, PMIK (Medical Records and Health Information Professionals) must possess at least the competencies based on the Indonesian Standard Competency for Medical Records and Health Information Professionals, as outlined in the Minister of Health Decree Number HK.01.07/Menkes/312/2020 concerning the Professional Standards for Medical Records and Health Information Professionals, which include knowledge, skills, and professional attitudes that must be mastered and possessed to perform activities professionally.

The assignment of diagnosis codes in patient medical records follows the ICD-10 (International Statistical Classification of Diseases and Related Health Problems) guidelines, so coders must be able to assign diagnosis codes in accordance with the applicable rules. According to WHO (2010), coding of delivery cases includes codes for the mother's condition (O00-O75), the method of delivery (O80-O84), and the outcome of delivery (Z37). The Z37 code is used as an additional code to indicate the outcome of the delivery. Therefore, accurate coding is essential for documentation and reporting. [3,4]

Accuracy in coding will generate high-quality data. Proper coding requires complete and clear medical records. Additionally, the results of coding are necessary for statistical processing to create reports on morbidity, mortality, identify the top 10 diseases, and coding can also be used as a disease index.[3]

Inaccuracies in coding occur at the 4th character, and staff are still inconsistent in writing the Z37.- code or outcome of delivery. The Z37.- code is used to identify the outcome of delivery and track neonatal mortality rates in hospitals, and it is reported quarterly. Inaccurate coding is due to the non-specific diagnosis written by doctors, which can affect the hospital's financing system.

These findings highlight a critical need for system-level interventions in order to reduce errors in documentation and coding. In this context, practical and technological solutions become essential. Inaccurate medical documentation and coding can lead to significant financial consequences for healthcare facilities. Inaccurate medical documentation and coding can lead to significant financial consequences for healthcare facilities. According to Indonesia’s Ministry of Health Regulation No. 76/2016, claims submitted to the national health insurance

system (BPJS Kesehatan) must adhere to INA-CBGs standards, which mandate accurate and complete medical records and coding. Non-compliance can result in claim denials, reduced reimbursements, or financial penalties, thereby affecting hospital revenues. Other research also emphasize that miscoding due to inadequate documentation can distort funding allocations and lead to reimbursement rejections.[5]

To mitigate these risks, implementing technology-based solutions is essential. Digital audit systems can automatically verify the completeness and accuracy of medical records before claim submission, identifying discrepancies and enabling timely corrections. Additionally, regular training for health professionals through e-learning platforms has proven effective in enhancing coding competencies and standardizing documentation practices. The World Bank, in collaboration with the American Health Information Management Association (AHIMA), conducted train-the-trainer workshops in Indonesia, benefiting medical coders from the Ministry of Health and BPJS Kesehatan, aiming to improve the accuracy and consistency of clinical coding.[6]

Furthermore, the adoption of electronic medical records (EMRs) is mandated by the Ministry of Health Regulation No. 24/2022, requiring all healthcare facilities to implement EMRs by December 31, 2023. This regulation facilitates the integration of digital audit trails and access controls, enhancing data accuracy and security.[7]

RESEARCH METHOD

This study employs a quantitative research design with a cross-sectional approach to analyze the relationship between the accuracy of medical terminology documentation and the precision of diagnosis coding in Obstetric cases. This approach was selected as it allows researchers to collect data from various cases at a single point in time and analyze their correlation. Data collection was conducted from October to November 2024, with data gathered incrementally each week to ensure the completeness of the information required for this study. Data were collected through direct observation of patient medical records. The sample for this study consists of 300 medical record documents of obstetric cases, selected using a simple random sampling method from a population of approximately 1,200 records, which was estimated using Slovin's formula with a 5% margin of error.

The collected data will be analyzed using descriptive statistics to illustrate the accuracy of medical terminology documentation and diagnosis coding. Subsequently, a correlation analysis will be conducted to assess the relationship between the accuracy of medical terminology documentation and diagnosis coding accuracy. A chi-square (χ^2) test will be used to determine the association between medical terminology accuracy and the precision of diagnosis coding in Obstetric cases.

The accuracy of medical terminology documentation was assessed by comparing the diagnosis written by physicians with the standardized terms listed in the ICD-10 reference. Documentation was considered accurate if it matched the appropriate ICD-10 medical terminology without the use of abbreviations, mixed language, or non-standard expressions. Diagnosis coding accuracy was evaluated by reviewing whether the assigned ICD-10 code

corresponded precisely to the documented diagnosis, including the correct use of 4th character detail and supplementary codes for delivery outcomes.

The chi-square (χ^2) test was used to assess the association between the accuracy of medical terminology documentation and diagnosis coding. The data were first coded into two categories—accurate and inaccurate—for both variables. A contingency table was then constructed to show the frequency distribution of combinations. The chi-square value was calculated and compared to the critical value at a significance level of 0.05 to determine whether the observed association was statistically significant.

Informed consent was obtained from all participants before their involvement in the study. Participants were fully informed about the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any point without any consequence. All personal data collected from the participants were anonymized and kept confidential to protect their privacy. Data was securely stored and only accessible to the research team. Furthermore, no identifying information was included in any reports or publications resulting from this study.

RESULTS AND DISCUSSION

Level of Accuracy in Medical Terminology Documentation

The analysis of the accuracy level in the writing of medical terminology in medical records for Obstetric cases, conducted on 300 medical records, can be seen in the following table:

Table 1. Frequency Distribution of Accuracy in Medical Terminology Documentation

Characteristics	Frequency	Presentation (%)
Accurate	166	55,3
Inaccurate	134	44,7
Total	**300**	**100**

Table 1 shows that the accuracy rate of medical terminology documentation in obstetric medical records is 55.3%. Accuracy was assessed by comparing the documented terminology against standardized diagnosis codes, namely ICD-10. A record was classified as accurate if the terminology precisely matched the relevant standard code without spelling errors, ambiguity, or deviation. Conversely, records were considered inaccurate if they contained misspellings, ambiguous terms, incorrect terminology, or failed to comply with the standardized coding system. Although over half of the cases met the accuracy criteria, nearly half did not, indicating a significant gap in documentation quality. This gap may adversely affect healthcare service quality and clinical decision making. Therefore, efforts to improve documentation accuracy such as intensive staff training, clearer guidelines, and supportive systems are essential to ensure compliance with applicable diagnosis coding standards.

The results of the study indicate that the accuracy of medical terminology documentation in obstetric case records at RSIA Puri Malang still requires improvement. Overall, only about 55.3% of diagnoses were documented correctly in accordance with the applicable standards.

This suggests that while a majority of cases have diagnoses recorded in line with the standards, a significant proportion of medical records still contain inaccuracies in the use of medical terminology. Accurate documentation of medical terminology is crucial as it ensures that the information in the medical records can be used appropriately for clinical decision-making. Inaccuracies in medical terminology may lead to misinterpretations of diagnoses and negatively impact the quality of healthcare services.

A study revealed that errors in the documentation of obstetric diagnoses at RS PKU Muhammadiyah Sukoharjo were caused by the use of Indonesian terms, abbreviations that do not conform to hospital standards, and terminology that did not align with ICD-10 guidelines.[3] The Ministry of Health of the Republic of Indonesia (2016) has issued regulations requiring doctors to document patient diagnoses in the Medical Record Document (MRD) in accordance with the standards outlined in ICD-10. This is now a duty and responsibility of doctors. Therefore, it is essential to conduct orientation and socialization for healthcare personnel at RSIA Puri Malang to ensure they accurately document patient diagnoses in the MRD following the applicable ICD-10 guidelines. Hatta (2013) also stated that, in addition to medical record officers, healthcare professionals, such as doctors, are also required to document patient diagnoses using the medical terminology established in ICD-10.[8]

In this study, it was found that diagnosis documentation still uses a mix of Indonesian and English. This finding is in line with the research conducted by Widyaningrum (2020), which stated that discrepancies in diagnosis documentation are caused by the habit of doctors or staff often mixing medical terminology with Indonesian.[9] This impacts the disease coding process, as coding officers may struggle to understand and identify the lead term, especially when doctors use unfamiliar or unclear terms. Coding officers will require more time to convert Indonesian terms into the appropriate medical terminology before assigning the diagnosis code. If coding officers do not fully understand medical terminology, it may hinder their ability to code accurately and affect the precision of diagnosis coding.

Analysis of the Level of Accuracy of Obstetric cases Diagnosis Codes

This study analyzed the accuracy of diagnostic codes in obstetric medical records. The purpose of this analysis was to identify the extent to which diagnosis codes were applied in accordance with established standards. Understanding the level of accuracy is expected to provide insights into the quality of diagnosis documentation in medical records and its potential impact on the care process and clinical decision-making. The following table presents the frequency distribution of diagnosis code accuracy in medical records for Obstetric cases.

Table 2. Frequency Distribution of Diagnosis Code Accuracy

No	Indicator	Frequency	Presentation (%)
1.	Inaccurate Code	14	4,7
2.	Incorrect 4th Character Category	6	2,0

No	Indicator	Frequency	Presentation (%)
3.	No Additional Code Assigned	0	0
4.	Uncoded	222	74,0
5.	Accurate Code	58	19,3
	Total	**300**	**100**

Table 2 reveals a concerning pattern in the accuracy of diagnosis coding for obstetric medical records. The fact that 74% of records remain uncoded suggests a significant gap in the documentation process, which can severely limit the utility of medical records for clinical evaluation, epidemiological studies, and healthcare planning. Additionally, the relatively low proportion of correctly coded records (19.3%) indicates insufficient adherence to coding standards, which may stem from inadequate training, lack of awareness, or system inefficiencies. Patient misidentification and sample identification errors can cause significant harm or discomfort. Accurate patient identification is crucial for quality care, as reliance on incorrect data can lead to errors in healthcare activities, miscommunication, and inappropriate treatment.[10]

Errors such as incorrect codes and inaccuracies in specific character categories, though lower in frequency, still highlight issues of precision that could compromise patient classification and data quality. Overall, these findings emphasize the urgent need for targeted interventions, including comprehensive coding training, enhanced supervision, and improved coding guidelines, to elevate the completeness and accuracy of diagnosis documentation in obstetric care. Accurate coding is essential for maintaining the integrity of patient records. Errors in coding can lead to misclassification of diseases, which can affect treatment plans and overall patient safety. Training helps healthcare workers understand and implement the correct coding practices, thereby improving the quality and reliability of healthcare data.[11]

Based on the data analysis conducted, it was found that the accuracy of diagnosis codes in obstetric case medical records at RSIA Puri Malang was also found to be insufficient. As many as 74% of medical records did not have diagnosis codes assigned, indicating a significant issue in the coding system. This clearly presents a major challenge for accurate medical documentation and can impact the quality of health data within the hospital. The findings of this study align with the research conducted by Rahmawati and Utami (2020), which stated that most diagnoses were uncoded, influenced by factors such as coding staff forgetting to enter codes on forms.[12]

It was found that only 19.3% of medical records were correctly coded, indicating that a substantial proportion of cases lacked accurate coding. The accuracy of diagnosis codes is crucial for statistical reporting, epidemiological analysis, and health policy planning and evaluation. The results of this study are consistent with the findings of Rahmawati and Utami (2020), who reported that 98% (43 medical records) were inaccurate due to errors in code selection, which were influenced by factors such as illegible handwriting from doctors and the presence of new diagnoses.[12]

Analysis of the Relationship Between Accuracy in Medical Terminology

Documentation and Diagnosis Code Accuracy in Obstetric Cases

The analysis of the relationship between the accuracy of medical terminology documentation and diagnosis code accuracy in Obstetric cases was conducted using the Chi-Square test. This test aims to determine whether there is a significant relationship between the accuracy of medical terminology documentation and the accuracy of diagnosis codes in medical records for Obstetric cases. Based on the results of the Chi-Square test, the following data were obtained:

Table 3. Chi-Square Tests

Diagnosis Code Accuracy	Diagnosis Terminology Accuracy		Total	P-value
	Correct	Incorrect		
Accurate	27	33	60	0,048
Inaccurate	142	98	240	
Total	**168**	**131**	**300**	

Based on the results of the Chi-Square test, a statistical value of 3.916 was obtained with a significance level (p-value) of 0.048. Since the p-value is less than 0.05, it can be concluded that there is a statistically significant relationship between the accuracy of diagnosis codes and the accuracy of diagnosis documentation. These findings suggest that the quality of diagnosis documentation is significantly related to the accuracy of the assigned codes.

The results of the Chi-Square test indicate a significant relationship between the accuracy of medical terminology documentation and diagnosis code accuracy (p-value = 0.048). This means that the more accurate the medical terminology used in the medical records, the greater the likelihood that the assigned diagnosis code will also be accurate. These findings align with previous studies, which have shown that errors in diagnosis documentation can directly impact the accuracy of the diagnosis codes assigned.[4,13–18]

The results of this study are consistent with other research which found that the hypothesis test using the chi-square test showed a significant relationship between the accuracy of medical terminology documentation and diagnosis code accuracy in cardiovascular cases at Panti Waluyo Hospital, Surakarta. Furthermore, this study's findings are relevant to other research which demonstrated a significant relationship between the accuracy of diagnosis documentation and the diagnosis code accuracy in obstetric cases and other various cases in inpatient medical records.[9,12,14,19]

These findings highlight a critical need for system-level interventions in order to reduce errors in documentation and coding. In this context, practical and technological solutions become essential.[17] Inaccurate medical documentation and coding can lead to significant financial consequences for healthcare facilities. Inaccurate medical documentation and

coding can lead to significant financial consequences for healthcare facilities.[3,9]

One of the key areas is the adoption of electronic documentation systems equipped with automatic error detection tools. According to a systematic review, documentation errors such as incompleteness, inaccuracy, and inconsistency are common, and one way to minimize these is by standardizing the documentation process and utilizing electronic documentation systems.[20]

According to Indonesia's Ministry of Health Regulation No. 76/2016, claims submitted to the national health insurance system (BPJS Kesehatan) must adhere to INA-CBGs standards, which mandate accurate and complete medical records and coding. Non-compliance can result in claim denials, reduced reimbursements, or financial penalties, thereby affecting hospital revenues.[21] Cheng et al. also emphasize that miscoding due to inadequate documentation can distort funding allocations and lead to reimbursement rejections.[5]

To mitigate these risks, implementing technology-based solutions is essential. Digital audit systems can automatically verify the completeness and accuracy of medical records before claim submission, identifying discrepancies and enabling timely corrections. Moreover, electronic patient records (EPR) systems have shown promise in improving the quality of patient care. By replacing traditional paper records, EPRs help achieve more accurate and complete documentation of patient information, thus streamlining clinical decision-making and enhancing communication among healthcare providers.[22] Implementing dedicated audit systems in nursing documentation highlights the potential benefits of digital systems over paper records. Studies have shown that digital records are more often rated as complete and are better at documenting risks and interventions, which supports proactive patient care and enhances the quality of nursing documentation.[23]

Additionally, regular training for health professionals through e-learning platforms has proven effective in enhancing coding competencies and standardizing documentation practices. Moreover, education and training are critical in reducing documentation and coding errors. Studies show that a lack of formal education in residency curricula contributes to inaccurate billing and documentation errors. Implementing a formal educational framework within training programs can enhance understanding and application of accurate billing and coding practices.[24] The World Bank, in collaboration with the American Health Information Management Association (AHIMA), conducted train-the-trainer workshops in Indonesia, benefiting medical coders from the Ministry of Health and BPJS Kesehatan, aiming to improve the accuracy and consistency of clinical coding.[6]

Furthermore, the adoption of electronic medical records (EMRs) is mandated by the Ministry of Health Regulation No. 24/2022, requiring all healthcare facilities to implement EMRs by December 31, 2023. This regulation facilitates the integration of digital audit trails and access controls, enhancing data accuracy and security.[7,25]

CONCLUSION

This study demonstrates a statistically significant relationship between the accuracy of medical

terminology documentation and the precision of diagnosis coding in obstetric case records at RSIA Puri Malang. Despite this finding, both documentation and coding practices still require considerable improvement.

To address these issues, it is recommended that healthcare facilities implement regular training programs for physicians and coding staff to ensure consistent adherence to ICD-10 guidelines and proper use of medical terminology. Moreover, standardized documentation protocols should be enforced, and digital audit systems should be introduced to routinely assess the completeness and accuracy of medical records. These practical strategies are essential for enhancing clinical data quality, minimizing claim errors, and ensuring fair and accurate reimbursement under the national health insurance system.

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