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ACCURACY OF WRITING THE DIAGNOSIS AND ACCURACY OF THE CEREBRAL INFARCTION CODE INPATIENT PATIENTS AT HOSPITAL X

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ABSTRACT

Issue: The implementation of the clinical classification system and the coding of health-related diseases must be in accordance with the correct medical terminology. The results of the initial survey of 10 medical resumes of inpatient *cerebral infarction* cases showed that 4 (40%) had the right diagnosis code and 6 (60%) did not have the right diagnosis code. The inaccuracy of the diagnosis code is due to the writing of the diagnosis of the disease not in accordance with medical terminology and there is no communication between the *coder* and the doctor. This can affect the quality of data, information and reports as well as the accuracy of rates for general patients and INA-CBG's rates used as a method of payment for BPJS patients so that it can have an impact on the decline in the quality of hospital services. **Objective:** To determine the accuracy of medical terminology and the accuracy of inpatient *cerebral infarction coding* at X House in 2023. **Methods:** This type of research is observational research with descriptive design. The population and samples in this study were 84 medical resume sheets of inpatient cases in 2023. The research data used secondary data using a checklist sheet instrument, then processed univariately using frequency distribution. Results: From 84 sheets of medical resumes of inpatient *cerebral infarction* cases, there were 56 (67%) complete and 28 (33%) incomplete medical terminology writing, and the accuracy of the diagnosis code 47 (56%) was accurate and 37 (44%) was inaccurate. It is hoped that the hospital will socialize the Diagnosis Writing policy that has been determined by management so that medical personnel write diagnoses in accordance with the terminology in ICD-10 as stated in the Standard Abbreviation Manual for Hospital X and include coders in coding training.

Keywords : *Cerebral Infarction*; Diagnosis Codes; Medical Records; Medical Terminology

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1. INTRODUCTION

According to Government Regulation of the Republic of Indonesia Number 47 of 2021 concerning the Implementation of the Hospital Field, every hospital that provides services to the public is required to organize services in the field of medical records which are carried out starting from data collection, data processing and presentation of health information. Regulation of the Minister of Health of the Republic of Indonesia Number 24 of 2022 concerning Medical Records states that in the process of processing medical record information, there is a coding process which is an activity of providing clinical classification

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codes in accordance with the international classification of disease diagnoses in accordance with statutory provisions. The important thing that must be considered by medical record personnel is the accuracy of diagnosis coding, because accurate coding requires complete and correct medical records including the writing of disease diagnoses by doctors (Hatta, 2013).

The coding process begins with the establishment of a diagnosis by a doctor which will then be coded by the coder by providing the correct disease classification code according to the coding standards of the *International Classification of Diseases and Related Health Problems, Tenth Revision* (ICD 10) published by WHO. Diagnosis of disease includes the main diagnosis is a health condition that is the cause of the patient getting treatment for examination, and is established at the end of service and is responsible for the needs of treatment resources. Establishment and writing of precise and clear diagnoses by doctors must be in accordance with the nomenclature in ICD 10 (Hatta, 2013).

In line with Made et al (2020) in determining and writing a diagnosis that must be in accordance with ICD-10 is the responsibility of the doctor, while *coding* officers must communicate well with each other in order to produce precise and accurate disease coding. If the writing of the diagnosis included in the medical record file is incorrect, it will affect the accuracy of coding and have an impact on the cost of health services.

According to the Ministry of Health of the Republic of Indonesia (2010) most hospitals in Indonesia (around 65%) have not made complete and clear diagnoses based on ICD 10 and have not coded correctly. The average percentage of inaccurate diagnosis codes in 30 health service facilities in Indonesia is 56.64%. Siswanto (2020) said in his research that the level of coding inaccuracy in several countries such as the UK and Saudi Arabia is around 20% to 70%. One of the factors causing the inaccuracy of diagnosis codes is because the writing of diagnoses by doctors is not specific according to the disease condition of each patient and does not refer to the ICD 10 classification standard (Laela, 2017). To prevent errors in *coding* diagnoses by *coders*, communication with doctors is needed to produce accurate codes so that they can be held accountable (Hatta, 2013).

Based on the results of research by Suryandari et al (2022) obtained from 100 samples as many as 70 (70%) correct diagnosis writing and 30 (30%) inappropriate, as well as 45 (45%) accurate diagnosis codes and 55 (55%) inaccurate. Medical records with incorrect diagnosis writing and inaccurate diagnosis codes are due to the writing of diagnoses that are not in accordance with medical terminology terms, causing the code to be inaccurate.

According to Amaliyah & Fitri (2022) in their research said that the consistency of writing diagnoses is something to improve the quality of hospital information, if the writing of diagnoses is inconsistent, the application of codes by the *coder* will have an inaccurate effect. Diagnosis writing and diagnosis codes are considered consistent if they are in accordance with ICD 10 rules.

Improper diagnosis writing will cause inaccurate diagnosis coding and the resulting information has a low level of data validation. This will affect the validity of disease index reports, morbidity and mortality reports, health service financing as well as epidemiological and clinical research materials (Hatta, 2013). In line with Rahmadhani's statement (2021) in his research, diagnosis coding is useful for providing nursing care, billing claims, improving service quality, comparing morbidity and mortality data, presenting the top 10 diseases and other matters related to health services.

Hospital X is a type C hospital and has been accredited with a Plenary rating which provides outpatient, inpatient and emergency care services. Based on a preliminary survey conducted by the author at the X Hospital Medical Record Installation in April 2024, it is known that the inpatient *coding* section has 3 *coders* with a medical record education background with a working period of 2 people ≤ 5 years and 1 person ≥5 years and has attended coding rules training, has a Standard Operating Procedure (SOP) for Coding in general and has a Standard Abbreviation Guidebook but there are no medical terms for *cerebral infarction* cases in the guidebook.

Based on the hospitalization report in the INA-CBG's application, *cerebral infarction* cases are included in the top 20 diseases. *Cerebral Infarction* or ischemic stroke is an attack that takes place at the age of 50 years or older with the main signs of sudden drop in blood pressure, difficult breathing and pale skin (Batticaca, 2012). The results of preliminary observations showed an increase in the trend of *cerebral infarction* cases in 2021 as many as 50 cases with improper diagnosis writing 17 (34%) and inaccurate codes 33 (66%), in 2022 there were 53 cases with improper diagnosis writing 9 (17%) and inaccurate codes 25 (47%) and in 2023 *cerebral infarction* cases increased by 103 cases.

The author intends to analyze the accuracy of writing diagnoses on the accuracy of *cerebral infarction* case codes, by looking at 10 medical records obtained 4 (40%) correct diagnosis codes and 6 (60%) incorrect diagnosis codes. One example is a patient with RM 22-30-17 recorded in his medical record, namely the diagnosis of *cerebral infarction* coded I63. In this case, the writing of the diagnosis is incorrect, the correct diagnosis should be *cerebral infarction*.

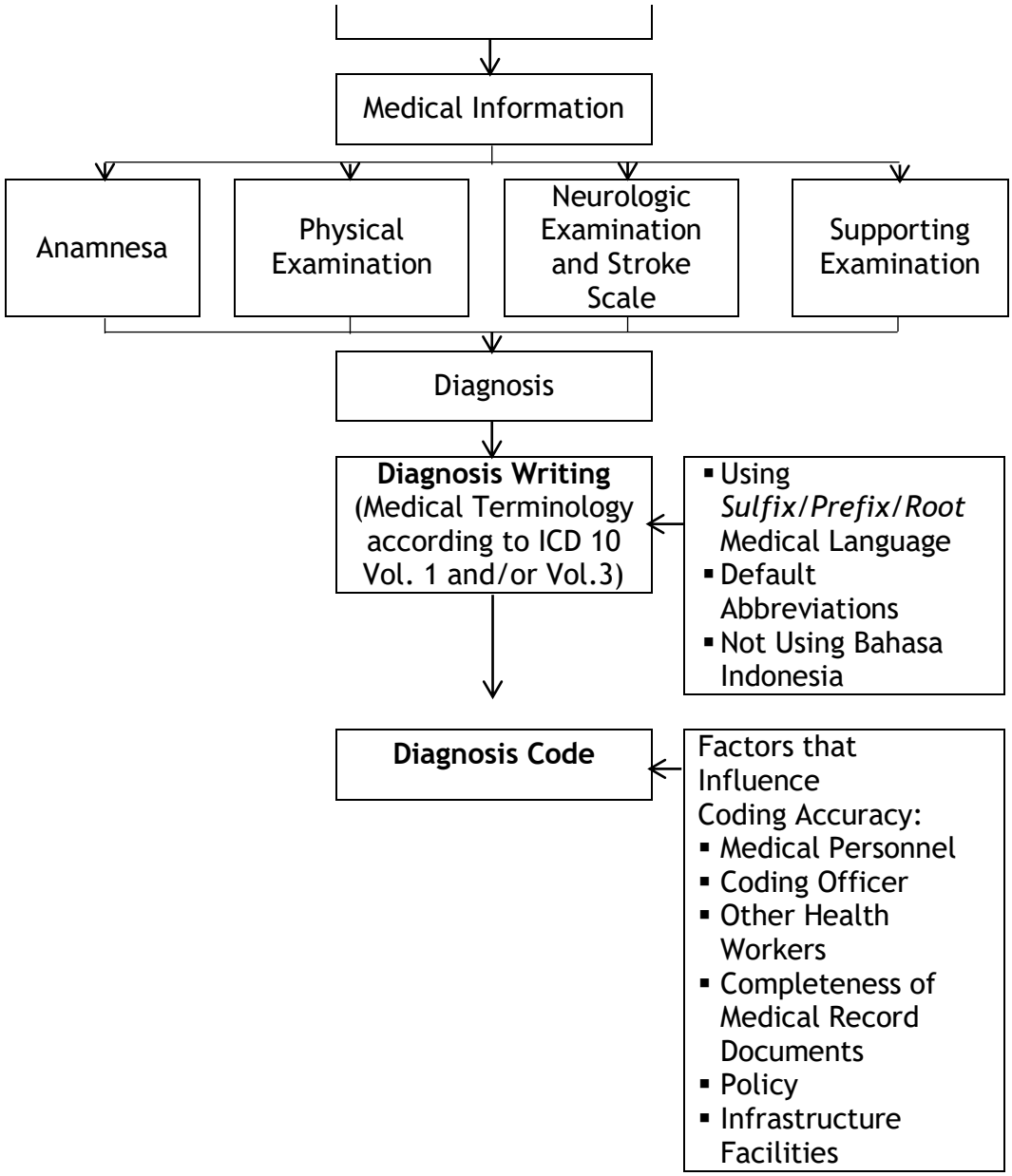
Based on the results of interviews with *coding* officers, it is known that the inaccuracy of diagnosis codes is due to the writing of diagnoses that often do not use the terms found in ICD 10 Vol 1 and / or Vol.3, *the* lack of communication between doctors and coders and the lack of *coder* accuracy in paying attention to the results of laboratory tests when writing diagnosis codes. In line with Hatta (2013), doctors who treat patients have duties and responsibilities for the enforcement and writing of diagnoses in accordance with ICD-10, and diagnoses written in medical records must be complete, precise and clear in accordance with medical terminology in the ICD-10 book.

Hatta (2013) said that the writing of medical terminology that is not in accordance with ICD-10 will cause the *coder* to have difficulty understanding the diagnosis listed on the medical record file, as a result it takes a long time to convert terms from Indonesian into medical terms based on ICD-10.

Based on the background description above, seeing the importance of medical records in creating continuous medical information, the authors are interested in conducting research on the Accuracy of Writing Diagnoses on the Accuracy of *Cerebral Infarction* Codes in Hospitalized Patients at X Hospital. This study aims to determine the accuracy of writing diagnoses and the accuracy of diagnosis codes.

2. THEORETICAL FRAMEWORK

Cerebral Infarction



Description: **bold** marks are the variables to be studied
Source : Budi (2011), KMK No.HK 01.07/Menkes/394/2019, Maryati & Sari (2019, Nuryati (2013), Sudra (2013), WHO (2010)

3. METHODOLOGY

This type of research is observational research with descriptive design. The population and samples in this study were medical resume sheets of inpatient cases in 2023 as many as 84. The research data used secondary data using an observation sheet instrument, then processed univariately using frequency distribution.

4. RESULTS AND DISCUSSIONS

a. Accuracy of *Cerebral Infarction* Diagnosis Writing at Hospital X

Table 1. Accuracy of Writing *Cerebral Infarction* Diagnosis at Hospital X

Diagnosis Writing	Total (n)	Percentage (%)
Complete	56	67
Incomplete	28	33
Total	**84**	**100**

Source: Secondary Data Processed, 2024

Based on table 1, it is known that the accuracy of writing *cerebral infarction* diagnoses is 56 (67%) complete and 28 (33%) incomplete. Inaccurate diagnoses are divided into two categories, namely using Indonesian and not using medical terminology that contains *root/suffix/prefix* elements. The following is an explanation of inaccurate diagnoses divided into three categories at Hospital X, namely:

1) Using Bahasa Indonesia

Of the 28 medical record files that did not correctly write medical terminology, there were 15 (54%) files writing diagnoses using Indonesian, which are described in the table below:

Table 3. Diagnosis Writing Using Indonesian Language

RM No.	Diagnosis Writing at BRM	Medical Terminology	Based on ICD 10
22-30-1x	Cerebral Infarction	Cerebral Infarction	Cerebral Infarction
13-67-7x	Cerebral Infarction	Cerebral Infarction	Cerebral Infarction
23-35-2x	Cerebri Infaq	Cerebral Infarction	Cerebral Infarction
22-35-2x	Cerebral Infarction	Cerebral Infarction	Cerebral Infarction
22-40-4x	Cerebral Infarction	Cerebral Infarction	Cerebral Infarction
22-47-3x	Cerebral Infarction	Cerebral Infarction	Cerebral Infarction
17-33-0x	Cerebral Infarction	Cerebral Infarction	Cerebral Infarction
22-53-0x	Cerebral Infarction	Cerebral Infarction	Cerebral Infarction
11-00-4x	Cerebral Infarction	Cerebral Infarction	Cerebral Infarction
22-66-1x	Cerebri Infaq	Cerebral Infarction	Cerebral Infarction
22-68-1x	Cerebri Infaq	Cerebral Infarction	Cerebral Infarction
16-88-8x	Cerebral Infarction	Cerebral Infarction	Cerebral Infarction
23-36-5x	Cerebri Infaq	Cerebral Infarction	Cerebral Infarction
23-11-1x	Cerebri Infaq	Cerebral Infarction	Cerebral Infarction

23-09-5x	Cerebri Infaq	Cerebral Infarction	Cerebral Infarction

Source: Secondary Data Processed, 2024

2) Not Using Medical Terminology that Contains *Root/Sulffix/Prefix*

Of the 28 medical record files that did not use the correct medical terminology, there were 13 (46%) files that used medical terminology that did not use medical terminology containing *root/sulffix/prefix* as described in the table below:

Table 4. Diagnosis Writing Does Not Contain *Root/Sulffix/Prefix*

RM No.	Diagnosis Writing at BRM	Medical Terminology	Based on ICD 10
22-35-2x	Musco Cerebri	Cerebral Infarction	Cerebral Infarction
22-54-8x	EC BPH	Cerebral Infarction	Cerebral Infarction
22-53-2x	Selebri Infaq	Cerebral Infarction	Cerebral Infarction
22-66-7x	Hemorrhagic Stroke	Cerebral Infarction	Cerebral Infarction
23-50-3x	Selebri Infaq	Cerebral Infarction	Cerebral Infarction
23-58-7x	Selebri Infaq	Cerebral Infarction	Cerebral Infarction
12-50-9x	Selebri Infaq	Cerebral Infarction	Cerebral Infarction
23-59-7x	Selebri Infaq	Cerebral Infarction	Cerebral Infarction
07-38-2x	Selebri Infaq	Cerebral Infarction	Cerebral Infarction
23-59-1x	Selebri Infaq	Cerebral Infarction	Cerebral Infarction
23-54-0x	Selebri Infaq	Cerebral Infarction	Cerebral Infarction
23-54-5x	Selebri Infaq	Cerebral Infarction	Cerebral Infarction
23-53-7x	Selebri Infaq	Cerebral Infarction	Cerebral Infarction

Source: Secondary Data Processed, 2024

Medical terminology is the science of medical terms used as a means of communication for people who play a direct or indirect role in the field of health services. Medical terminology must be in accordance with the terms used in a disease classification system to support the accuracy of disease codes (Nuryati, 2011).

Based on the results of observations and interviews with coding staff, the factors that influence the inaccuracy of medical terminology writing are the writing of diagnoses established by DPJP using Indonesian and the writing of medical terminology does not use *root/sulffix/prefix* elements. This is due to medical staff's lack of understanding of writing diagnoses using correct medical terminology. The lack of uniformity in diagnosis writing results in the difficulty of

the coder in understanding and understanding the diagnosis written down, which can affect the accuracy of the code and the quality of medical record data.

In line with the results of Maryati's research (2016) which says that the inaccuracy of diagnosis writing is due to doctors using Indonesian, abbreviations that are not in accordance with standard abbreviations in hospitals and spelling terminology that is in accordance with the spelling in ICD-10, and Saraswati & Sudra (2015) in their research said that writing diagnoses with inappropriate terms can occur because medical staff lack understanding of writing diagnoses using correct medical terminology.

According to the Ministry of Health of the Republic of Indonesia (2006), the determination of a patient's diagnosis is the obligation, rights and responsibilities of the relevant medical personnel. The diagnosis in the medical record must be filled in completely and clearly in accordance with the directions in the ICD-10 book. This is reinforced by Mariyati & Sugiarsi (2014) in their research saying that it is necessary to make a list of main diagnosis abbreviations that are often used by doctors so that the writing of diagnoses is in accordance with ICD-10 directions.

According to Hatta (2013), doctors who treat patients have the duty and responsibility for enforcing and writing diagnoses in accordance with ICD-10 and diagnoses written in medical records must be complete, precise and clear according to the spelling of medical terminology with directions in ICD-10. All diagnoses and procedures must be written in full without symbols with acceptable terminology (Hatta, 2013). The writing of medical terminology in accordance with the ICD-10 directives aims for uniformity of language in medical terminology, so that the medical terminology written on the patient's medical record file can be read, easy to understand and precise in its writing.

Improper diagnosis writing will cause inaccurate diagnosis coding and the resulting information has a low level of data validation. This will affect the validity of disease index reports, morbidity and mortality reports, health service financing as well as epidemiological and clinical research materials (Hatta, 2013). In line with the Ministry of Health of the Republic of Indonesia (2010), if the writing of the diagnosis included in the medical record file is incorrect, it will have an impact on the diagnosis code generated by a *coder*.

Therefore, in order to write medical terminology appropriately, Hospital X should socialize the Diagnosis Writing Policy that has been established by Management so that medical personnel write diagnoses in accordance with the terminology in ICD-10 as contained in the Standard Abbreviation Guidebook of Hospital X.

b. Accuracy of *Cerebral Infarction* Diagnosis Codes at Hospital X

Table 2. Accuracy of *Cerebral Infarction* Diagnosis Codes at Hospital X

Diagnosis Code	Total (n)	Percentage (%)
Accurate	47	56
Inaccurate	37	44
Total	**84**	**100**

Source: Secondary Data Processed, 2024

Based on table 2, it is known that the accuracy of the *cerebral infarction* diagnosis code is 47 (56%) accurate and 37 (44%) inaccurate. The inaccuracy of *the cerebral infarction* diagnosis code at Hospital X is due to the diagnosis code

not being in accordance with ICD 10 Chapter IX. The cause of the inaccurate code where the diagnosis is only coded up to the third character which should be coded up to the fourth character in the case of *cerebral infarction* is the writing of medical terminology established by DPJP in medical record files written using Indonesian as many as 15 (54%) files, and not using medical terminology containing *root/sulffix/prefix as many as* 13 (46%) files, this makes it difficult for *the coder* to understand and understand the diagnosis written down, resulting in errors in determining the diagnosis code. Example: No.RM 22-66-XX with a diagnosis (hemorrhagic stroke) written diagnosis code on the medical record file I63 code, should be based on ICD-10 Chapter IX is I63.9.

Deficiencies in the third character category indicate that the *coder* is less careful / difficult in determining the right *leadterm* (keyword) of the patient's diagnosis, and deficiencies in the fourth character can indicate that the diagnosis code is less specific where this can be caused by the *coder* not paying attention to additional information contained in the medical record file. In line with Maryati (2016) in her research, she said that the inaccuracy in the diagnosis code due to errors in the third and fourth characters was due to the *coder* not being careful in choosing the *leadterm* and not specifically paying attention to additional information contained in the patient's medical record file.

According to WHO (2010), the implementation of diagnosis coding must be complete and precise in accordance with ICD-10 directives. Each Chapter in ICD-10 is divided into blocks. Each block consists of a list of three-character categories. Each category is divided into four-character sub-categories. Four-character sub-categories are best used for identification, such as different site variations in the three-character categories or stand-alone diseases in the three-character categories for conditions that are clustered for proper coding.

The accuracy of coding of a diagnosis is highly dependent on the implementation of those handling the medical record, namely medical personnel in determining the diagnosis and writing clearly, medical record personnel as coders, other health workers. According to the Ministry of Health (2006) that medical personnel as coders are responsible for the accuracy of the code of a diagnosis that has been determined by medical personnel. so that for incomplete or unclear diagnosis writing written in medical record files, before the code is determined, it should be communicated first to the doctor who made the diagnosis.

The accuracy of diagnosis writing established by DPJP and the accuracy of diagnosis codes coded by *coders* in accordance with ICD-10 directives greatly affect the quality of statistical data, inaccurate morbidity reports and inaccurate determination of patient health cost payment rates resulting in decreased hospital quality.

According to Maimun et al (2018) accurate codes must absolutely be obtained so that hospital morbidity reports made can be accounted for, and Pramono & Nuryati (2012) say that patient diagnosis codes that are not coded accurately will cause the resulting information to have low data validation and result in errors in determining payment rates.

In line with Rahmadhani's statement (2021) in his research, diagnosis coding is useful for providing nursing care, billing claims, improving service quality, comparing morbidity and mortality data, presenting the top 10 diseases and other matters related to health services.

According to Roman, et al (2011) medical record management policies regarding the filling of diagnoses and the accuracy of diagnosis codes have a great influence on the course of filling diagnoses and the accuracy of diagnosis

codes. Every health care facility, both hospitals and health centers, must make the procedure policy a guideline for coding officers so that they can carry out coding consistently (Hatta, 2013).

Therefore, in order to accurately code diagnoses in inpatient cases without errors in coding diagnoses and the fourth character, Hospital X should do the following, namely:

1. Improve *coder* knowledge and skills through ICD-10 compliant coding training.
2. Creating a procedure policy on filling in diagnoses and the accuracy of diagnosis codes is a guideline for coding staff so that they can carry out coding consistently.

5. CONCLUSION

The accuracy of writing *cerebral infarction* diagnoses using medical terms written by the case of the Doctor in Charge of the Patient (DPJP) will affect the accuracy of the diagnosis code written by the coder by paying attention to supporting files, such as laboratory / radiological examination results.

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