



EVALUATION OF THE ACCURACY OF MEDICAL TERMINOLOGY AND ITS RELATIONSHIP TO THE ACCURACY OF CLINICAL CODING IN HEALTH FACILITIES: SYSTEMATIC LITERATURE REVIEW

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Abstract

Clinical Coding will be accurate if the proper medical language is used while writing. Clinical coding that is appropriate may help healthcare organizations with things like accurate care, billing for services, strategic planning, and statistical and financial analysis. The purpose of the study, which employed a methodical literature analysis, was to ascertain the link between the clinical coding accuracy in healthcare institutions and the correctness of medical terminology. This study is an organized review of the literature. Google Scholar, Garuda, Neliti, the Indonesian Scientific Journal Database (ISJD), Semantic Scholar, PubMed, and ScienceDirect are the databases that were used. PRISMA (Preferred Reporting Items for Systematic Review and Meta-analysis) is the strategy used for the literature selection. The Reinforcement of Observational investigation Reporting in Epidemiology (STROBE) tool was used to evaluate the caliber of the literature in this investigation. The study's findings show that the average value of clinical coding accuracy in healthcare facilities is 48%, with 14 articles having accuracy levels above or below 50%. The average value of medical terminology accuracy in healthcare facilities is 55%, with 11 articles having accuracy levels below 50. Up to 79% of the study's findings indicated a connection between the precision of clinical coding and the precision of medical language. Comparatively, 21% of respondents claimed there was no connection between clinical coding accuracy and medical terminology correctness.

Keywords: Relationship, Medical Terminology Accuracy, Clinical Coding Accuracy

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INTRODUCTION

Implementing medical records is one of the supports for improving the quality of health services in hospitals. In the Regulation of Health Meter of the Republic of Indonesia, Number 269 / MENKES / PER / III / 2008, medical records contain records and documents about patient identity, treatment, actions, and other patient services. The Medical Recorder and Health Information is responsible for managing medical records. Medical records must contain complete and consistent written health information, including medical language because it is one means of communication between health workers. Medical terminology is the science of medical terms used to communicate between health workers.

Writing correct, clear, and informative medical terminology can help clinical coders select lead terms and accurately code diseases according to ICD-10) (Rosita & Wiqoyah, 2018).

According to the Institute of Medicine (in Saputro), the accuracy of coding a diagnosis depends on the executor who handles medical records, one of which is a clinical coder. Knowledge of correct medical terminology is something that every clinical coder needs to have to be able to code the diagnosis correctly (Niko Tesni Saputro, 2016).

The results of Agustine's research (2017) using the chi-square statistical test obtained a value ($p\text{-value} = 0.03376 < 0.05$), revealing that there is a relationship between the accuracy of medical terminology and the accuracy of clinical Coding (Agustine & Pratiwi, 2017). The accuracy of diagnosis data is crucial in clinical data management, cost billing, and other matters related to care and health services (Hatta, 2009).

According to Yuniati Research (in Pertiwi, J.), clinical coding errors can reduce hospital revenue by 32.6% and lower income from claims by calculating Rp. 559,632,015.00 with a difference of less than the standard of 8% or Rp. 48,958,416.00 (Pertiwi, 2019). Research conducted by Zafirah et al. revealed the potential losses experienced by one teaching hospital in Malaysia when the clinical coder incorrectly determined the diagnosis code reached RM 654,303.91 (2.2 billion rupiah) per year (Zafirah et al., 2018). According to MOH (in Primary), doctors, other medical personnel, and coders affect the accuracy of the diagnosis code. Doctors have a vital role in the accuracy and completeness of diagnosis. A

diagnosis written with the right medical terminology by ICD-10 will make it easier for clinical coders to do clinical Coding (Pratama, 2020).

Accurate Coding is obtained from the results of the diagnosis analysis written by the doctor using the appropriate medical terminology ICD-10. One of the problems that can occur in hospitals due to inaccuracy in medical terminology is a misunderstanding between doctors and clinical coders in interpreting medical terms in inpatient diagnoses. Writing the language of the diagnosis referred to by the doctor cannot be conveyed properly. The clinical coder cannot understand it, and this can cause different perceptions between doctors and clinical coders.

Given the importance of the accuracy of medical terminology by doctors in medical records in the implementation of clinical Coding to support the quality of diagnosis codes and the lack of utilization of research results on the accuracy of medical terminology to the accuracy of clinical Coding, the author is interested in conducting a systematic review study entitled "Evaluation of the Accuracy of Medical Terminology and its relationship to the Accuracy of Clinical Coding in Health Facilities.

The general purpose of research using this systematic review is to determine the accuracy of medical terminology and its relationship to the accuracy of clinical Coding in health facilities, the accuracy of clinical Coding. While the specific objectives are 1) Describe the accuracy of medical terminology in health facilities, 2) Describe the accuracy of clinical Coding in healthcare facilities, and 3) Describe the relationship between the accuracy of medical terminology and clinical Coding.

According to Nuryati in Maryati, medical terminology is the science of medical terminology which is a means of communication between those directly or indirectly involved in the medical services field (Maryati, 2016). Medical terminology is a vocabulary specifically used by professionals in health care (Astuti, 2019). Medical terminology is a language and term widely used when communicating between health professionals during oral and written communication. This health terminology science is very complex and includes a history of terms; word sources; medical abbreviations; anatomy and body systems, diseases, and medical

procedures (Ganthina, 2016).

The emphasis of medical terminology material rests on the field of service (Astuti, 2019): 1) Medical diagnosis (medical diagnostic): ultrasound, CT-scan, MRI, endoscopic; 2) Surgical: Laparoscopy, colostomy; 3) Other procedures in medicine: conservative and radiation.

Medical abbreviations widely used in health and medicine can include acronyms of disease/condition names, names of instruments used for diagnosis, names of examination results/records, or other characters (Ganthina, 2016). The terms diseases or health conditions must be used in a disease classification system to support the accuracy of clinical codes (Agustine & Pratiwi, 2017).

The medical terminology used in writing a diagnosis is appropriate when it uses medical terms corresponding to ICD-10 and can describe the patient's specific condition. Conversely, medical language in writing a diagnosis is inappropriate when using medical terms not by ICD-10, such as using the time Indonesian. Besides that, it is said to be wrong if using non-standard abbreviations (Agustine & Pratiwi, 2017). The Ministry of Health of the Republic of Indonesia (in Pratama) states that the accuracy of a patient's diagnosis is an obligation, right, and responsibility of the doctor that is related and must not be changed so that the diagnosis in the medical record must be written clearly and completely by the direction of ICD-10 (Pratama, 2020).

According to Hatta (in Sudra), the writing of the diagnosis made by the doctor must use the language of medical terminology by using block letters so that it can be read easily and clearly. The impact if the diagnosis is inaccurate, affects the cost of health services, and hospital report data and information is also incorrect. Non-specific medical terminology will also impact wrong diagnosis codes (Sudra et al., 2016).

The medical terms used in the disease classification system (ICD-10) consist of pure medical terminology and medical language. Still, not all medical language is medical terminology because, in principle, medical terminology can be broken down into elements of medical terminology: prefixes, roots, and suffixes. Using the right terminology language must have at least one root and the medical terminology language must be in accordance with the applicable classification system (Mariyati & Sugiarsi, 2014;

Mariyati, 2013). Prefixes can be one or two words, the initial elements of a comment in the form of prepositions or adverbs. There are four categories related to the meaning and words formed, namely general, negative, numeric, and problem/disease prefixes (Anatasia Lipursari, 2013).

The root can be located in a sentence's middle, beginning, or end, and another source can follow meat before a suffix or pseudo suffix. Suffixes or pseudosuffixes are used to form nouns, adjectives, or verbs. Suffixes are classified into public suffixes, diagnostic/disease suffixes, operative/surgical suffixes, and procedure/treatment suffixes (Ganthina, 2016).

Users/users of medical terminology are all health workers based on government regulation no. 32 of 1996, namely 1) medical personnel (doctors, dentists, specialists); 2) Nursing Personnel and Midwives; 3) Pharmaceutical personnel; 4) Nutritional Energy; 5) Physical Therapy Personnel (Physiotherapy, Therapy Occupation, Speech Therapy, etc.); 6) Public Health Personnel; 7) Medical Technicians (Medical Recorder and Health Information, Radiographer, Analyst, etc.) (Astuti, 2019).

Accurate means the information must be free from errors and not misleading or biased. Proper means also that the written data must reflect its intent, so it must be clarified. The information must be correct because from the source of information to the recipient of the communication, there can be a lot of noise that can damage or change information (Anatasia Lipursari, 2013). Accuracy is the recording and measurement of facts that produce the report. Therefore, being careful in recording and measuring points can determine the accuracy of the data and the value of the information made (Supriyanti et al., 2018).

Clinical Coding is to make a disease diagnosis code based on the applicable disease classification (Guidelines for the Implementation and Procedures of Hospital Medical Records in Indonesia Revision II, 2006). Clinical Coding provides the primary diagnosis code, secondary diagnosis by ICD-10, and procedure codes by ICD-9-CM. Koding is very decisive in the prospective financing system that will determine the amount of costs paid to hospitals (Ministry of Health RI. Regulation of the Minister of Health of the Republic of Indonesia Number 27 of 2014

concerning Technical Guidelines for the Indonesian Case Base Groups (INA-CBGs) System, 2014). The accuracy of clinical Coding is the writing of disease diagnosis codes that correspond to the classification in ICD-10. The code is considered appropriate and accurate by the patient's condition with all actions that occur, complete according to the classification rules used (Pramono Eko & Nuryati, 2013).

The clinical coding result code becomes the basic data for health institutions, which, if properly managed, can benefit health service institutions, either directly or indirectly, so clinical coding results must be correct. These benefits include care accuracy, maintenance fee collection, strategic planning, statistical and financial analysis, output analysis, clinical pathway development, utilization monitoring, healthy and prosperous initiatives, research, economic credentialing, case-mix analysis and case management, resource allocation, and marketing, identification of "best practices," supporting clinical decisions, comparison of appearance with other health care organizations, and analysis of practice patterns. So if an institution experiences problems in the accuracy of clinical Coding, it will affect these benefits (Pepo & Yulia, 2015).

According to Hatta (in Pramono), the Coding accuracy process must monitor several elements, namely 1) Consistent when coded by different officers, the code remains the same (reliability); 2) Code appropriate according to diagnosis and action (Validity); 3) Includes all diagnoses and actions in the medical record (Completeness); 4) Timeless (Pramono, Eko & Nuryati, 2013). Factors that affect coding accuracy are 1) Medical Personnel; 2) Clinical Coding; 3) Completeness of medical record documents; 4) Policy; 5) Facilities/Infrastructure (Garmelia et al., 2017). A systematic review is a research method to identify, evaluate and interpret each relevant research result related to a particular topic, certain research question, or phenomenon of concern. A systematic review is beneficial in synthesizing many relevant research results so that the facts given to policymakers are more balanced and comprehensive (Siswanto, 2010).

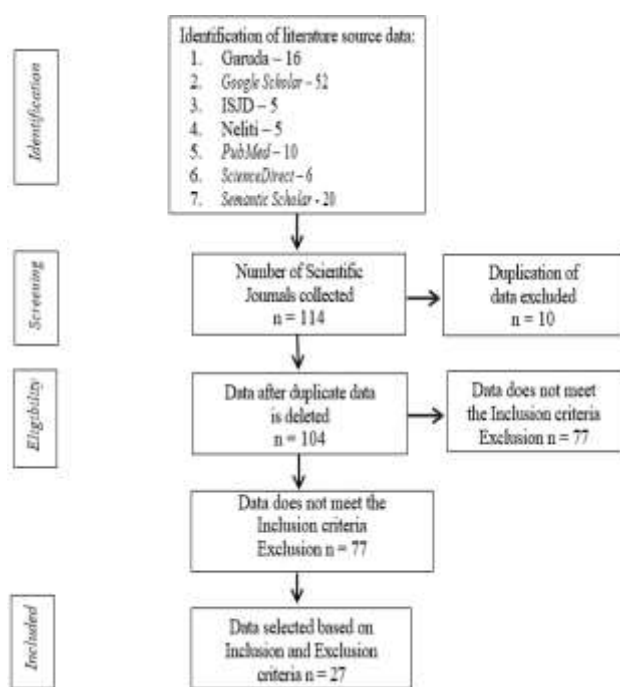
A systematic review aims to answer more specific, relevant, and focused questions. A systematic review also reduces bias from reviews, studies research results, synthesizes results and identifies research gaps. A systematic review is

needed as a determination of the research agenda, as part of a dissertation or thesis, and is a part that complements the application for research grants (Hariyati, 2010).

METHOD

This research is a systematic review (Systematic Review), which is a method of carrying out article reviews with standards and criteria structured and planned before the implementation of article synthesis. The steps of systematic review consist of 1) Defining goals, 2) Literary search, 3) Assessment study, 4) Combining results, and 5) Establishing results (Hariyati, 2010). The keywords and boolean operators used are "relationship" OR "relation" AND "Accuracy" OR "Accuracy" AND "Medical Terminology" OR "Medical Terminology" AND "Coding Accuracy" OR "Clinical Coding Accuracy." This study's database sources used in searching literature are Google Scholar, Garuda, Neliti, Indonesian Scientific Journal Database (ISJD), Semantic Scholar, PubMed, and ScienceDirect.

Eligibility criteria in this study include inclusion and exclusion criteria. The inclusion criteria in this study are 1) Literature in the form of Research articles 2) Source of research articles Google Scholar, Garuda, Neliti, Indonesian Scientific Journal Database (ISJD), Semantic Scholar, PubMed, and ScienceDirect 3) research articles using Indonesian and English, 4) Year of publication of research articles between 2009-2020, 5) Articles are Quantitative research 6) Research Articles discuss the relationship between the accuracy of medical terminology to Clinical coding accuracy. While the exclusion criteria in this study are 1) Constitute a Literature Study, 2). Incomplete Article Text 3) No Journal Name, year, volume, or journal number. Literature selection using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) method. Here is the PRISMA Flow Diagram in this study:



Gambar 1. Prisma Flow Diagram

Based on the PRISMA method that has been carried out, results can be obtained from a total of 114 (One hundred and fourteen) journal articles identified, 10 (Ten) of which were excluded due to data duplication, then 77 (seventy-seven) others did not meet the inclusion and exclusion criteria. So only 27 (twenty-seven) journal articles are used in literary studies. In addition, to limit the scope of research, researchers use the PICO (Population / Problem, Intervention, Comparison, Outcomes) method, as shown in the following table:

Table 1. PICO Overview

Component	Information
Population/Problem	Medical Terminology
Intervention	Accuracy of medical terminology to accuracy of clinical Coding
Comparison	N/a
Outcomes	The Relationship of Accuracy of Medical Terminology to the Accuracy of Clinical Coding

This study's assessment of literature quality uses the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) instrument (because the literature used is quantitative research type literature. The STROBE instrument contains 22 (twenty-two) quality assessment components.

The number of scientific journals that use

the instrument is 27 (twenty-seven). Scientific journals must meet 11 assessment components to be used as a source of literature in this study. The eleven components used are attached. Based on the quality assessment carried out on 27 (twenty-seven) journals meeting the minimum achievement, it can be used as a source of literature in this study.

The synthesis data process in this study was carried out by comparing literature that had met the quality assessment and inclusion and exclusion criteria. Scientific journals that do not meet the established standards will not be used as literature sources. Synthesis data refers to the purpose of the study, namely, Knowing the relationship between the accuracy of medical terminology to the accuracy of clinical Coding.

The output of data extraction is in the form of a table consisting of the name of the researcher, year of publication, research title, research objectives, place of research, data source, the relationship between the accuracy of medical terminology and the accuracy of clinical Coding,

RESULTS AND DISCUSSION

Accuracy of medical terminology in healthcare facilities

Based on the assessment of literature quality and data extraction that has been carried out on 27 kinds of literature, the average value of accuracy of medical terminology in healthcare facilities can be obtained at 55%, a minimum value of 8%, and a maximum value of 84% (Table 2).

Table 2. Percentage of Medical Terminology Accuracy

No	Name of Researcher/ Year of Research	Accuracy
1	Riska Rosita, Ni'Matul Wiqoyah (2018)	56%
2	Defa Miftara Agustine, Rita Dian Pratiwi (2017)	23%
3	Ning Riyanti (2013)	84%
4	Warsi Maryati, Aris, Octavian Wannay, Devi Permani Suci (2018)	44%
5	Aurelius Anugerah Harvey Pepo, Noor Yulia (2015)	59%
6	Maisharoh, Elza Juniati (2020)	36%
7	Yeni Tri Utami (2017)	84%
8	Warsi Maryati (2016)	35%

9	Bangkit Ari Pratama (2020)	29%
10	Rani Puspita Ningrum, Lily Widjaya (2016)	74%
11	Rano Indradi Sudra, Antik Pujihastuti (2016)	66%
12	Antik Pujihastuti, Rano Indradi Sudra (2014)	70%
13	Andi Karisma Nurdiyansyah, Ibn Mardiyoko (2016)	30%
14	Ema Rahmawati, Laili Rahmatul Ilmi (2018)	80%
15	Linda Widyaningrum (2017)	60%
16	Luciya Feorentina, Henny Maria Ulfa (2020)	60%
17	Eni Nur Rahmawati, Titi Dwi Utami (2020)	42%
18	Warsi Maryati, Riska Rosita, Ayu Putri Zanuri (2019)	32%
19	Rudolf Noer Addien Binanda Putra (2016)	74%
20	Yeni Tri Utami, Nita Rosmalina (2019)	8%
21	Endang Sri Dewi Hastuti Suryandari (2017)	28%
22	Nurul Bandiani (2018)	80%
23	Maulana Tomy Abiyasa, Dyah Ernawati, Lily Kresnowati (2012)	79%
24	Hamid (2013)	59%
25	Mehrdad Farzandipour, Abbas Sheikhtaheri, F. Sadoughi (2010)	66%
26	S. A. Zafirah, Amrizal Muhammad Nur, Sharifa Ezat Wan Puteh and Syed Mohamed Aljunid (2018)	24%
27	Mehrdad Farzandipour, Abbas Shikhtaheri, (2009)	83%

Of the 27 articles reviewed, there were only 11 whose accuracy rate was below 50%. The most common type of inaccuracy is the non-specificity of the diagnosis written by the doctor. Of the 27 kinds of literature, 16 of them stated that the type of inaccuracy in medical terminology found was diagnosed written by non-specific doctors, 13 of which noted that the inaccuracy that occurred was the use of abbreviations, and 9 of them used non-medical terms, and 11 of them were vague writing.

Accuracy of clinical Coding in Healthcare facilities

Based on the assessment of literature quality and data extraction that has been carried out on 27 kinds of literature, the average value of clinical coding accuracy in healthcare facilities can be obtained at 48%, the minimum value is quite low

at only 10%, and the maximum value reaches 87% (Table 3).

Table 3. Percentage of Medical Terminology Accuracy

No.	Name of Researcher/ Year of Research	Accuracy
1	Riska Rosita, Ni'Matul Wiqoyah (2018)	87%
2	Defa Miftara Agustine, Rita Dian Pratiwi (2017)	35%
3	Ning Riyanti (2013)	79%
4	Warsi Maryati, Aris, Octavian Wannay, Devi Permani Suci (2018)	30%
5	Aurelius Anugerah Harvey Pepo, Noor Yulia (2015)	50%
6	Maisharoh, Elza Juniati (2020)	46%
7	Yeni Tri Utami (2017)	36%
8	Warsi Maryati (2016)	42%
9	Bangkit Ari Pratama (2020)	26%
10	Rani Puspita Ningrum, Lily Widjaya (2016)	66%
11	Rano Indradi Sudra, Antik Pujihastuti (2016)	66%
12	Antik Pujihastuti, Rano Indradi Sudra (2014)	70%
13	Andi Karisma Nurdiyansyah, Ibn Mardiyoko (2016)	11%
14	Ema Rahmawati, Laili Rahmatul Ilmi (2018)	25%
15	Linda Widyaningrum (2017)	10%
16	Luciya Feorentina, Henny Maria Ulfa (2020)	54%
17	Eni Nur Rahmawati, Titi Dwi Utami (2020)	56%
18	Sri Maryati (2013)	81%
19	Warsi Maryati, Riska Rosita, Ayu Putri Zanuri (2019)	16%
20	Rudolf Noer Addien Binanda Putra (2016)	47%
21	Yeni Tri Utami, Nita Rosmalina (2019)	52%
22	Endang Sri Dewi Hastuti Suryandari (2017)	10%
23	Nurul Bandiani (2018)	43%
24	Maulana Tomy Abiyasa, Dyah Ernawati, Lily Kresnowati (2012)	81%
25	Hamid (2013)	77%
26	Mehrdad Farzandipour, Abbas Sheikhtaheri, F. Sadoughi (2010)	66%
27	S. A. Zafirah, Amrizal Muhammad Nur, Sharifa Ezat Wan Puteh and Syed Mohamed Aljunid (2018)	24%
28	Mehrdad Farzandipour, Abbas Shikhtaheri, (2009)	58%

The average value of clinical coding accuracy in healthcare facilities is less than 50%, which is 48%. Of the 28 articles reviewed, 14 (fourteen) pieces have accuracy below 50%.

The relationship between the accuracy of medical terminology and the accuracy of clinical Coding

Based on the assessment of literature quality and data extraction that has been carried out, information was obtained that from 27 (twenty-seven) literature, there were 22 (twenty-two), or 81% of them, stated that there was a relationship between the accuracy of medical terminology and the accuracy of clinical Coding. In contrast, 5 (five) or 19% said there was no relationship between the precision of medical language and the accuracy of clinical Coding.

Accuracy of medical terminology in healthcare facilities

According to Astuti, Medical Terminology is a vocabulary specifically used by professionals in Health Care (Astuti, 2019). The accuracy of medical terminology is an assessment of whether or not the diagnosis is accurate in the use of medical terminology language by the patient's DPJP doctor contained in the patient's medical record. Based on the assessment of literature quality and data extraction that has been carried out on 27 kinds of literature, the average medical terminology accuracy in healthcare facilities can be obtained at 55%, a minimum value of 8%, and a maximum value of 84%.

Rosmalina's research shows that the accuracy of medical terminology is quite low, at only 8%. Inaccuracy occurs because doctors often do not write the diagnosis of pulmonary tuberculosis in several forms. After all, several conditions must be repeatedly filled out with the same diagnosis in one medical record. Often doctors only fill out diagnoses on medical resume forms with non-specific diagnoses because filling out other forms takes a long time, while doctors also have to handle other patients; this is not by the theory of the Ministry of Health RI (in Pratama) states that the accuracy of a patient's diagnosis is the right, responsibility and obligation of the doctor related and must not be changed so that the diagnosis in the medical record needs to be written completely and clearly by the direction of ICD-10 (Pratama, 2020).

Research by Utami shows the highest number of medical terminology, reaching 84%. This data shows that doctors at Surakarta City Hospital know that the accuracy of this medical terminology is critical because it is the basis for clinical coders in determining the diagnosis code. Medical terminology is the science of medical terms that become the language of communication between those indirectly or indirectly involved in medical services.

Of the 28 articles reviewed, there were only 11 whose accuracy rate was below 50%. The accuracy of writing a diagnosis is critical because it acts as a means of communication between medical professionals; one of the emphases of medical terminology material is a medical diagnosis. When the diagnosis is miswritten, the cost of health services is affected. Hospital report data and information also become inaccurate. Writing diagnoses with non-specific medical terminology will also impact the inaccuracy of the diagnostic code produced by the clinical coder (Sudra et al., 2016).

From the graph of inaccuracies in medical terminology in health facilities, it can be seen that the most common type of inaccuracy is the non-specificity of the diagnosis written by the doctor. Non-specific diagnosis means a diagnosis that the doctor does not register in full. Of the 28 kinds of literature, 16 state that the type of inaccuracy in medical terminology is diagnosed written by non-specific doctors. The medical language used in a diagnosis is appropriate if the medical term corresponds to ICD-10 and can describe the patient's specific circumstances. Non-specific medical terminology will impact incorrect diagnosis codes (Sudra et al., 2016).

Rahmawati's research shows the type of inaccuracy with the use of abbreviations and non-medical terms at the Kalasan Sleman Health Center, for example in the diagnosis "Abd. Pain" written in the medical record, based on the medical terminology of ICD-10, the correct writing should be "Abdominal Pain," in addition to the diagnosis "Gg. Refraction" which should be written "Disorder of refraction," "Gg. Anxietas" which should be written "Anxiety disorder," and "Serumen Prop" which should be noted, "Impacted cerumen." Among the 28 kinds of literature, 14 of them stated that the inaccuracy that occurred was the use of abbreviations, and 10 of them used non-medical terms, medical

terminology in writing the diagnosis was said to be inappropriate when using medical words that were not by ICD-10, such as using Indonesian terms, besides that it was said to be wrong if using non-standard abbreviations (Agustine & Pratiwi, 2017).

Research by Maryati (2016) shows examples of inaccuracies in medical terminology that occur at PKU Muhammadiyah Sukoharjo Hospital related to obstetric cases. Some medical terms related to diagnosis use abbreviations and non-medical terms. For example, in the diagnosis of "Premature Rupture of Membranes," which is abbreviated to "KPD," "Hyperemesis gravidarum" is written with the abbreviation "HEG," "Breech Presentation" is written with "Presbo," "Blighted ovum" is written with "Empty Pregnancy / BO" and "Antepartum hemorrhage" is written with "Antepartum Hemorrhage / APH."

Accuracy of clinical Coding in Healthcare facilities

The accuracy of clinical Coding is the writing of disease diagnosis codes that correspond to the classification in ICD-10. The code is considered appropriate and accurate by the patient's condition with all actions that occur, complete according to the classification rules used (Pramono & Nuryati, 2012). Based on the assessment of literature quality and data extraction that has been carried out on 27 kinds of literature, the average value of clinical coding accuracy in healthcare facilities can be obtained at 48%, the minimum value is quite low at only 10%, and the maximum value reaches 87%.

Research by Widyaningrum shows that the accuracy of clinical Coding is only 10%. One of the causes of clinical coding inaccuracies encountered in medical terminology errors in medical records written by doctors, where doctors more often use mixed language between medical terminology and Indonesian, ultimately impacting the difficulty of clinical coders to determine lead terms. Clinical coders will take longer to convert Indonesian words into appropriate medical language before deciding the diagnosis code. In addition, the type of error that occurs a lot is a code error in the 4th character, and this is because coders often do not cross-check from the ICD-10 volume 3 book to the ICD-10 volume 1 book. An example of an incorrect diagnosis code in the 4th character found by researchers in the diagnosis of "Repeat cesarean section" coded by the Clinical

coder is O82.1, whereas in ICD-10 Volume 1, the correct code for the diagnosis of "Repeat cesarean section" is O82.0 (Widyaningrum, 2017).

Research by Rosita and Wiqoyah (2018) shows the highest clinical Coding accuracy rate of 87%. This is because clinical coders often ask doctors about writing unclear diagnoses so that the level of accuracy remains high, even though the medical record of the diagnosis is incomplete. From these activities, it has become a habit, so coding officers already understand the writing of diagnosis written by the doctor, and the code given becomes accurate (Rosita & Wiqoyah, 2018).

Of the 28 articles reviewed, 13, or 52%, had an accuracy rate below 50%. Research by Nurdiansyah and Mardiyoko, with an accuracy rate of 11%, even though there has been an SOP for Coding set at Bhayangkara Hospital, the accuracy of clinical Coding is still very low. This is due to the implementation of clinical Coding that is not by the established SOP, where clinical Coding must be carried out after the medical record has been assembled, namely checking the completeness of the medical record sheet and the completeness of the doctor's notes, especially notes about the diagnosis that is written in the medical record. However, the findings showed that as many as 89% of the samples found were already on the storage rack in an uncoded state. The diagnosis is not coded because the diagnosis column that the doctor must fill in is not filled, and some are filled in, but the clinical coder's writing is not clear and illegible (Nurdiansyah & Mardiyoko, 2016).

The clinical coding result code becomes the basic data for health institutions, which, if properly managed, can benefit health service institutions, either directly or indirectly, so clinical coding results must be correct. These benefits include care accuracy, maintenance fee collection, strategic planning, statistical and financial analysis, output analysis, clinical pathway development, utilization monitoring, healthy and prosperous initiatives, research, economic credentialing, case-mix analysis and case management, resource allocation, and marketing, identification of "best practices," supporting clinical decisions, comparison of appearance with other health care organizations, and analysis of practice patterns. So if an

institution experiences problems in the accuracy of clinical Coding, it will affect these benefits (Pepo & Yulia, 2015).

Research by Agustine and Pratiwi shows examples of clinical coding inaccuracies at the Bambanglipuro Bantul Health Center. For example, the diagnosis of "Schizophrenia" coded by the clinical coder at the puskesmas is F20, which should be coded "F20.9", "Chronic obstructive pulmonary disease," which is coded by the clinical coder of the puskesmas is "J44" which should be "J44.9", and "Acute upper respiratory infection" which is coded by the clinical coder of the puskesmas is "J.06" What should be "J06.9". The inaccuracy is because clinical coders at Puskesmas only use three characters when they should use four characters by the Clinical Coding Guidelines in ICD-10 Volume 2. In addition, there are also examples of inaccuracies in the diagnosis code, which should be more specific with the addition of the 5th character but only uses four characters, for instance, in the diagnosis "Myalgia," which is coded by the clinical coder of the puskesmas is "M79.1" which should be "M79.12", the addition of the 5th character as the location code of pain is not used by the clinical coder at the Bambanglipuro Bantul Health Center. In addition, there are also clinical coding errors in some cases, for example, in the diagnosis of "Urinary tract infection," which is coded by the clinical coder of the health center as "N30.0" which should be "N39.0" (Agustine & Pratiwi, 2017).

The relationship between the accuracy of medical terminology and the accuracy of clinical Coding

One type of inaccuracy in writing a diagnosis is because doctors do not write a specific diagnosis which ultimately has an impact on the diagnosis code to be inaccurate and will affect the cost of health services, data, and erroneous hospital report information (Agustine & Pratiwi, 2017; Sudra et al., 2016). Based on the data extraction that has been carried out, information was obtained from 27 (twenty-seven) literature, 22 (twenty-two), or 81% of them, stated that there is a relationship between the accuracy of medical terminology and the accuracy of clinical Coding. This is in line with the results of Pertiwi's research on factors that affect the accuracy of clinical Coding, which found that elements of paramedical resources that affect coding accuracy include: ease

of doctor's writing to read, suitability of writing diagnosis with the main diagnosis criteria based on coding rules, completeness of medical record document records. Paramedics are the first determinant of the accuracy of the diagnosis because they deal directly with patients (Pertiwi, 2019).

Research conducted by Agustine (2017), Maryati (2018), Maisharoh (2020), and Nurdiansyah (2016) stated that there is a relationship between the accuracy of medical terminology and the accuracy of clinical Coding; the four kinds of literature reviewed also showed the same percentage of medical terminology accuracy and clinical coding accuracy, which was below 50%. The same is also shown by studies with more than 50% medical terminology accuracy, and the clinical Coding accuracy rate is more than 50%. This is shown by research by Riyanti (2013), Pepo (2015), Ningrum (2016) and Pujihastuti (2014).

There are 5 or 19% of the literature states that there is no relationship between the accuracy of medical terminology and the accuracy of clinical Coding. Rosita and Wiqoyah's research with hypothesis testing using the Chi-square Test obtained a significant value ($p = 0.103$) greater than 0.05 showing no relationship between the accuracy of medical terminology and the accuracy of clinical Coding, the accuracy of medical terminology found only 56% produced clinical coding accuracy figures reached 87%. From the results of interviews that have been conducted, it is known that although the doctor's writing is not clear and difficult to read, with the habit of asking the clinical coder the doctor regarding an unclear diagnosis, the clinical coder can produce an accurate code even though the medical terminology in the medical record is not clear, this is a factor in the absence of a relationship between the accuracy of writing the main diagnosis medical terminology and the accuracy of the code (Rosita & Wiqoyah, 2018).

Utami's research shows that the analysis results with the Chi-square test obtained a significant value ($p = 0.365$) greater than 0.05. This means that the H_0 hypothesis is accepted. It can be known that there is no relationship between the accuracy of medical terminology and the accuracy of clinical Coding. This is supported by data on the accuracy of medical terminology, which is quite high, reaching 84%. The results of

code accuracy found are only 36%. Several factors affect the accuracy of clinical Coding: Medical Personnel (Doctors), Coding Officers, Completeness of medical record documents, Policies and facilities, and infrastructure (20). In this study, the accuracy of medical terminology is not the cause of inaccuracy in choosing the primary diagnosis but can also be caused by other factors. One of the factors that cause the clinical coder to be wrong in determining the main diagnostic code is the clinical coder is wrong in reading and understanding the doctor's writing, the workload of officers is very high, and the clinical coder's service period is two years. To reduce inaccuracies in the clinical coder code, ask the doctor concerned if the doctor's writing cannot be understood. However, because of the busy work of the doctor and clinical coder, sometimes they do not have time to ask first if there are difficulties.

CONCLUSION

From 27 (twenty-seven) literature, the average accuracy of medical terminology in healthcare facilities is 55%, the minimum value is 8%, and the maximum value reaches 84%. There are 11 articles whose accuracy rate is below 50%. From 27 (twenty-seven) literature, the average clinical coding accuracy in healthcare facilities was 48%, the minimum value was quite low at only 10%, and the maximum value reached 87%. There were 14 (fourteen) articles whose accuracy was below 50%.

Of the 27 (twenty-seven) literature, 22 (twenty-two), or 81% of them, stated a relationship exists between the accuracy of medical terminology and the accuracy of clinical Coding. In contrast, 5 (five) or 19% state that there is no relationship between the precision of medical language and the accuracy of clinical Coding.

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