



Analysis of the implementation of BPJS regulations on the completeness of medical records and the accuracy of obstetric coding at RS X Sukabumi

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Article Info	ABSTRACT
Article history: Received Oct 1, 2026 Revised Oct 14, 2026 Accepted Oct 21, 2026 Keywords: BPJS Regulations; Claim; Coding Accuracy; Medical Record Completeness; Obstetric.	The completeness of medical records and the accuracy of coding are important aspects in supporting the BPJS claim process. However, previous research has not extensively examined the relationship between the completeness of medical records and the accuracy of obstetric coding, nor the factors influencing the implementation of BPJS regulations. This study aims to analyze the implementation of BPJS regulations regarding medical record completeness and obstetric diagnosis coding accuracy and identify influencing factors. The research uses a qualitative approach involving 244 obstetric patient medical record files from January to May 2026. Data were collected through document review, observation, and in-depth interviews with six purposively selected informants. Medical record completeness was assessed across six dimensions, while coding accuracy was evaluated through recoding based on ICD-10, the POGI 2022 Coding Guidelines, and BPJS claim regulations. Results showed that 92 files (38%) were complete, while 152 (62%) were incomplete. Of the diagnosis codes, 139 (56.97%) were accurate and 105 (43.03%) were inaccurate. Contributing factors included staff competence and workload, outdated SOPs, hybrid medical record systems, clinical documentation quality, and resource limitations. The novelty of this research lies in the integrated analysis of medical record completeness, obstetric coding accuracy, and the 5M factors in the context of BPJS regulation implementation. Incomplete medical records and inaccurate diagnosis codes may hinder claim verification and increase the risk of pending or rejected BPJS claims. Strengthening staff competencies, updating SOPs, improving documentation, integrating systems, and conducting periodic coding audits are required to improve claim accuracy and completeness.

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1. INTRODUCTION

The National Health Insurance Program (JKN) through the Health Social Security Agency (BPJS Kesehatan) uses the Indonesian Case Based Groups (INA-CBG) system as one of the payment mechanisms for health services at Advanced Referral Health Facilities (FKRTL). In this process, the information contained in medical records serves as the basis for determining diagnosis, actions, coding, case grouping, and claim submission. Medical records not only function as documentation of

patient services but also as a source of information that supports the coding and claim process for JKN. The management of medical records in healthcare facilities is regulated by the Minister of Health of the Republic of Indonesia Regulation Number 24 of 2022. The standard tariffs for healthcare services in the Health Insurance program are regulated by the Minister of Health of the Republic of Indonesia Regulation Number 3 of 2023. These conditions indicate that the completeness of clinical information and the accuracy of coding are important parts in supporting the implementation of services and the JKN claim process (Kementerian Kesehatan RI, 2022).

In general, issues with the completeness of medical records and the accuracy of coding remain a concern in the JKN claim process (Yuliani et al., 2024). Obstetric cases are more complex because they involve pregnancy, childbirth, postpartum conditions, complications, and comorbidities requiring detailed documentation. Incomplete or unclear information can hinder accurate diagnosis and code assignment, while complete documentation supports coding accuracy in accordance with applicable guidelines (Suryandari et al., 2025).

A study of 300 obstetric case medical records at RSIA Puri Malang found a relationship between the accuracy of medical terminology and the accuracy of diagnosis coding with a p-value of 0.048 (Alvionita & Zein, 2025). In a study in the United States, the use of ICD-10 codes showed limitations in identifying severe maternal morbidity compared to the results of medical record reviews (Boulet et al., 2024). Differences in the ability of ICD-10 codes were also found in identifying hypertensive disorders during pregnancy (Labgold et al., 2021). From the perspective of human resources and technology, training personnel and using electronic diagnostic terminology tools have been reported to help improve the accuracy of ICD-10 coding (Olagundoye et al., 2021).

Documentation and coding issues are also related to the JKN claim process. The quality of medical record documentation was found to be associated with the accuracy of diagnosis codes in INA-CBG claim documents (Yuliani et al., 2024). Research on 24,005 medical records of JKN patients in tertiary hospitals in Indonesia found claim issues related to incomplete medical records, incomplete medical resumes, coding errors, and staff competence. The research also showed that process improvements through Failure Mode and Effects Analysis (FMEA) can help reduce issues in the claims process (Marpaung et al., 2022).

Previous studies have identified associations between medical terminology accuracy and diagnosis coding accuracy (Alvionita & Zein, 2025), limitations of ICD-10 codes in identifying maternal conditions (Boulet et al., 2024; Labgold et al., 2021) and the influence of documentation quality on coding accuracy and JKN claim issues (Yuliani et al., 2024; Marpaung et al., 2022). Other research has examined the role of staff training and electronic diagnostic terminology tools in improving coding accuracy (Olagundoye et al., 2021). However, based on the literature reviewed, these studies have not comprehensively examined how BPJS regulatory implementation relates to medical record completeness, obstetric diagnosis coding accuracy, and claim problems within a single hospital-based analysis. Furthermore, limited evidence integrates these outcomes with the interconnected organizational factors of Man, Method, Machine, Material, and Money (5M). This leaves an empirical gap in understanding how regulatory implementation, clinical documentation, coding practices, and resource-related factors interact in the obstetric JKN claims process. This study addresses this gap by examining these interrelated aspects at RS X Sukabumi using the 5M approach.

A preliminary study of 10 BPJS obstetric inpatient medical records at RS X Sukabumi found that 7 records (70%) were incomplete, 5 (50%) had inaccurate diagnosis codes, and 4 (40%) had pending claims. The main issues included incomplete clinical documentation, lack of formal coding training, workload demands, outdated coding SOP (last updated in 2020), and limited training budget allocation. These findings suggest that medical record completeness and coding accuracy are influenced by interconnected factors involving human resources, procedures, and documentation.

The application of the 5M approach is important because the implementation of BPJS regulations in the obstetric claims process involves interconnected factors that cannot be evaluated solely through medical record completeness or coding accuracy. The preliminary findings at RS X Sukabumi revealed incomplete records, inaccurate diagnosis codes, and pending claims, indicating

the need to examine the underlying organizational factors. The 5M approach enables a structured evaluation of staff competence (Man), procedures and SOPs (Method), information systems (Machine), clinical documentation (Material), and resource availability (Money). By examining these factors together, this study can identify areas requiring improvement and provide a basis for more targeted interventions to support regulatory compliance, accurate coding, and reliable BPJS claims.

The novelty of this study lies in integrating medical record completeness, obstetric coding accuracy, and BPJS regulation implementation using the 5M approach. This provides a comprehensive understanding of the factors affecting documentation, coding, and claims processes. Therefore, this study aims to analyze BPJS regulation implementation in relation to medical record completeness and obstetric coding accuracy at RS X Sukabumi and identify contributing factors based on the 5M approach.

2. RESEARCH METHOD

This study uses a qualitative approach with a descriptive design to analyze the implementation of BPJS regulations on the completeness of medical records and the accuracy of obstetric diagnosis codes at RS X Sukabumi. This approach is used to obtain an overview of the documentation conditions, coding processes, procedure implementation, and factors affecting the incompleteness of medical records and the inaccuracy of diagnosis codes. Data were obtained through documentation studies, observations, and in-depth interviews (Sugiyono, 2022; Creswell & Poth, 2018).

The study was conducted at RS X Sukabumi, involving a population of 625 BPJS obstetric inpatient medical records submitted for claims from January to May 2026. A sample of 244 records was determined using Slovin's formula with a 5% margin of error and selected through simple random sampling. Six informants were selected using purposive sampling based on their roles, responsibilities, and involvement in medical record management, obstetric services, diagnosis coding, and BPJS claims. This selection aimed to obtain relevant information from different perspectives regarding BPJS regulatory implementation and the factors influencing documentation, coding, and the claims process. The study examined medical record completeness, obstetric diagnosis coding accuracy, BPJS regulatory implementation, and contributing factors using the 5M approach (Man, Method, Machine, Material, and Money).

The research instruments comprised document review checklists, observation guidelines, and semi-structured interview guides developed based on medical record regulations and BPJS claim provisions. Medical record completeness was assessed using indicators covering patient identity, anamnesis, physical examination, supporting examination results, diagnosis, treatment, discharge summary, and authentication. Each applicable required element was classified as complete when the information was available, clear, and authenticated where required, and incomplete when required information was missing, unclear, or lacked required authentication.

A record was classified as complete when all applicable required elements were fulfilled; otherwise, it was classified as incomplete. Obstetric diagnosis coding accuracy was assessed through re-coding based on documented clinical information, ICD-10, the 2017 National Clinical Practice Guidelines (PNPK) for the Management of Pregnancy Complications, and the 2022 Indonesian Obstetrics and Gynecology Association (POGI) Coding Guidelines. Codes were classified as accurate when they corresponded to the documented diagnosis and complied with applicable coding conventions and specificity requirements, and inaccurate when they did not meet these criteria. The re-coded results were compared with the codes assigned by the hospital. BPJS Health Verification Result Reports (BAHV) were also reviewed to identify claim-related issues.

Instrument content validity was assessed through expert judgment by three experts: the Head of Medical Services and Medical Support, the Head of the Casemix Unit, and a BPJS Kesehatan verifier. They rated indicator relevance using a four-point scale. The results were analyzed using the Item Content Validity Index (I-CVI), Scale Content Validity Index/Average (S-CVI/Ave), and Scale

Content Validity Index/Universal Agreement (S-CVI/UA). Of the 28 indicators assessed, 26 met the validity criteria and were used in the study (Polit & Beck, 2006).

Data were analyzed using the interactive Miles and Huberman model, comprising data collection, data reduction, data presentation, and conclusion drawing and verification (Sugiyono, 2022). Document review results were summarized using frequencies and percentages, while observation and interview data were analyzed descriptively based on BPJS regulatory implementation and the 5M factors. Data validity was strengthened through source and technique triangulation.

3. RESULTS AND DISCUSSIONS

Characteristics of Respondents

Qualitative data mapping began by identifying informants directly involved in medical record documentation, obstetric services, diagnosis coding, and BPJS claim management. Informants were purposively selected based on their knowledge, experience, and involvement, including casemix officers, the head of medical records, the head of the obstetric inpatient ward, obstetric-gynecology specialists, and the head of casemix as a triangulation informant.

Table 1. Demographic characteristics of key informants

Informant	Clinical Role	Last Education	Work Period
Informant 1 (R)	Obstetric Case Coder	D3 RMIK	2 Years
Informant 2 (S)	Head of Medical Records Unit	D3 RMIK	12 Years
Informant 3 (L)	Head of Delivery Room	Bachelor of Midwifery Profession	10 Years
Informant 4 (F)	Midwife	Bachelor of Midwifery Profession	5 Years
Informant 5 (J)	Obstetrician & Gynecologist	dr., Sp. OG	4 Years
Informant 6 (I)	Head of Casemix	Bachelor of Public Health	13 Years

Source: Primary data, 2026

Based on Table 1, the six informants have relevant roles and competencies in medical records, obstetric services, coding, and casemix, with 2–13 years of work experience and diverse educational backgrounds. This diversity supports the analysis of medical record completeness and obstetric coding accuracy.

Completeness of Medical Records in Obstetric Cases in the BPJS Claim Process

Medical record completeness was assessed in 244 BPJS obstetric patient records across six dimensions, diagnosis completeness and consistency, diagnosis recording consistency, treatment and medication documentation, written consent, recording practices, and potential legal issues. The assessment examined content quality, consistency, and traceability to determine whether records adequately support clinical services, diagnosis, coding, and BPJS claims.

Table 2. Recapitulation of obstetric medical record completeness

Category	Count (n)	Percentage (%)
Complete	92	38
Incomplete	152	62
Total	244	100

Source: Primary data, 2026

Based on Table 2, 92 files (38%) were complete, while 152 files (62%) were incomplete. Incompleteness was mainly related to insufficient clinical information to describe patients' conditions and establish consistency between diagnoses, procedures, and examination results. Further analysis examined each dimension to identify the main documentation deficiencies.

Table 3. Recapitulation of medical record completeness based on analysis dimensions

No	Dimension	Complete (n)	Complete (%)	Incomplete (n)	Incomplete (%)
1.	Review of diagnosis completeness and consistency	92	37,70	152	62,30

2.	Review of diagnosis recording consistency	118	4836	126	51,64
3.	Review of recording during treatment and medication	92	37,70	152	62,30
4.	Review of the presence of informed consent	244	100	0	0
5.	Review of recording practices	142	58,20	102	41,80
6.	Review of aspects that may pose legal issues	150	61,48	94	38,52

Source: Primary data, 2026

Based on Table 3, the highest incompleteness (62.30%) occurred in diagnosis completeness and consistency and treatment and medication recording. The main deficiencies included insufficient anamnesis, unavailable or undocumented supporting examination results, incomplete Integrated Patient Progress Notes, and undocumented patient management. In contrast, written consent was available in all reviewed files (100%). These findings indicate that medical record completeness issues involve not only document availability but also the quality and completeness of clinical information.

Further review found that incompleteness mainly involved diagnostic support and management documentation. In failed induction cesarean cases, maternal or fetal indications were unclear; in oligohydramnios, ultrasound results or amniotic fluid index (AFI) were missing; and in cephalopelvic disproportion (CPD), pelvic measurements were inadequately documented. Severe preeclampsia (PEB) cases lacked complete laboratory results (urea, creatinine, SGOT/SGPT, platelets, and LDH), while hyperemesis gravidarum (HEG) with dehydration lacked fluid administration observation sheets. An inpatient referral letter was also issued during outpatient control and used for a cesarean section more than a week later.

The findings indicate that incomplete documentation limits the traceability of services from patient condition and examination to diagnosis and management. In obstetric cases, maternal and fetal conditions, clinical findings, and supporting examinations are essential for assessment and management. The 2017 National Medical Service Guidelines (PNPK) for the Management of Pregnancy Complications emphasize monitoring maternal and fetal conditions through clinical and supporting examinations, including ultrasonography and cardiotocography (CTG). Therefore, incomplete documentation limits the traceability between patient condition, diagnosis, and actions (Kementerian Kesehatan RI, 2017).

That condition is further related to the process of coding obstetric diagnoses. The 2022 Obstetrics and Gynecology Coding Guidelines (POGI) provide specific references in determining codes based on the patient's condition and clinical context. Thus, incomplete or inconsistent diagnostic information can complicate the coder's task in determining the most appropriate code (Central Board of the Indonesian Obstetrics and Gynecology Association, 2022). The use of ICD-10 also requires sufficiently specific diagnostic information so that the assigned code can accurately reflect the patient's condition. The completeness of medical information therefore plays a role in supporting the accuracy of the diagnostic code, as incomplete clinical information can limit the coder's ability to assign the appropriate code (Suryandari et al., 2025).

The relationship between the quality of documentation and coding is also supported by previous research, Lamb et al. (2008) menemukan adanya permasalahan dalam pengkodean morbiditas obstetri yang berkaitan dengan kelengkapan, spesifisitas, redundansi, dan urutan informasi. Meanwhile, Alonso et al. (2020) identifying missing or unclear information as well as variations in the writing of diagnoses as issues in medical records that can affect the quality of coded data. Thus, the high incompleteness in this study can potentially impact the information that serves as the basis for the obstetric diagnosis coding process.

In the context of BPJS claims, this connection becomes increasingly important because medical record information is used in the coding process and subsequently supports the submission and verification of claims. Research Agustina & Novratilova. (2026) that the coding flow in the BPJS claim process starts from the documentation of diagnosis and services by healthcare personnel,

which is then used by coders to assign codes before the claim submission process. Therefore, the implementation of BPJS regulations in this study is not only viewed from the availability of files for claim submission but also from the ability of medical records to provide complete, consistent, and traceable information.

Thus, the incompleteness in anamnesis, supporting examinations, CPPT, or management documentation indicates that there are parts of clinical information that have not been optimally documented. These conditions can hinder the correlation between clinical conditions, diagnoses, actions, and the codes used in BPJS claims. Therefore, the completeness of medical records becomes an important part in supporting the coding and verification process of claims as well as the implementation of BPJS regulations in obstetric services.

The Accuracy of Diagnosis Codes for Obstetric Cases in the BPJS Claim Process

The accuracy of obstetric diagnosis codes is assessed by comparing the codes set by the hospital with the recoding results based on ICD-10, the 2022 Obstetrics and Gynecology Coding Guidelines (POGI), and the regulations used in the BPJS claims process.

Table 4. Obstetric diagnosis code accuracy

Diagnosis Code Accuracy	Count (n)	Percentage (%)
Accurate	139	56,97
Inaccurate	105	43,03
Total	244	100

Source: Primary data, 2026

Table 4 shows that 139 files (56.97%) have accurate diagnosis codes, while 105 files (43.03%) have inaccurate codes. Although the proportion of accurate codes is higher, the level of inaccuracy reaching more than two-fifths of the files indicates that obstetric diagnosis coding is still not optimal. The inaccuracies found include the selection of less specific codes, diagnoses not fully reflected in the codes, and discrepancies between documented clinical information and the assigned codes. These issues become important in obstetric cases because the codes in Chapter XV Pregnancy, childbirth, and the puerperium have specific characteristics and coding rules, making their determination require complete and clear clinical information.

Several forms of inaccuracy in this study highlight the importance of the relationship between clinical documentation and the coding process. In the case of a failed induction, for example, the hospital used code O61.9, whereas the documentation indicated a medical induction, which requires further review of the code specifications used (Central Board of the Indonesian Obstetrics and Gynecology Association, 2022). In the case of childbirth by cesarean section, there was also found the use of codes that do not fully describe the characteristics of the action, especially those related to emergency conditions and the clinical reasons for the action. Additionally, for diagnoses in the O98–O99 group, accompanying conditions need to be supported by the underlying disease code according to the guidelines (World Health Organization, 2016). These findings indicate that code determination is not sufficient based solely on the brief diagnosis listed, but requires a review of all clinical information in the medical record.

The findings of this study are consistent with previous research on the quality of obstetric morbidity coding in Australia, which identified various coding issues, including completeness, redundancy, specificity, and sequencing (Lamb et al., 2008). Validation of ICD-10 codes for cases of placental accreta spectrum also found 39.6% false positive codes, indicating that administrative codes do not always accurately represent clinical conditions and therefore require validation against medical records (Benipal et al., 2025). Similarly, only 25.2% of heart disease cases during pregnancy showed full agreement between administrative data and clinical diagnosis, indicating that inaccuracies and misclassification in obstetric coding remain a significant issue (Amarasinghe et al., 2026).

The relationship between the availability of clinical information and coding accuracy is also supported by previous research. When coders rely solely on discharge summaries, coding

inaccuracies reach 70%, whereas the use of case notes reduces inaccuracies to 58%, indicating that the coding process should consider the entirety of available clinical information rather than relying on a single documentation source (Tsopra et al., 2018). Ambiguitas dan ketidaklengkapan dalam dokumentasi klinis juga telah diidentifikasi sebagai hambatan dalam proses pengkodean klinis (Alonso et al., 2020). Therefore, the inaccuracies found in this study should be understood not only as a coding issue but also related to the quality and completeness of the clinical information used as the basis for coding.

In the context of BPJS claims, diagnostic coding inaccuracies may affect claim verification, subsequent audits, and payment accountability. During verification, discrepancies between clinical documentation, diagnoses, procedures, and assigned codes may lead to requests for clarification, claim revisions, or pending claims. After payment, claims may still be subject to further audits or reviews to assess the consistency of the submitted information with the medical records and applicable regulations. If an audit identifies an incorrect payment, the hospital may be required to return the excess or improper payment in accordance with applicable provisions. These implications highlight that accurate obstetric diagnosis coding is essential not only for administrative claim processing but also for ensuring appropriate verification, reducing potential claim disputes, and maintaining the accountability of BPJS payments.

Overall, the results indicate that the accuracy of obstetric diagnosis coding in this study is not yet optimal, although more than half of the records have accurate codes. The relatively high proportion of inaccurate codes highlights the need to strengthen the quality of clinical documentation, improve coders' understanding of obstetric coding guidelines, and enhance the review and verification of codes before claims are submitted. These efforts are important to ensure that clinical information is translated into appropriate diagnosis codes and to minimize potential issues during the verification or audit of BPJS claims in the future.

Causes of Incomplete Medical Records and Inaccurate Obstetric Diagnosis Codes Based on the 5M Factors

Table 4. 5M factor matrix affecting the completeness of medical records and coding accuracy

5M Factor	Component/Material		Informant's Answer
Man	Coding staff competency	staff	Informant 1: Coding staff have not received specialized obstetric coding training and still rely on available guidelines.
	Healthcare knowledge	worker	Informants 2–4: Some healthcare workers do not fully understand medical record completeness requirements supporting diagnosis and coding, requiring socialization and interprofessional coordination.
	Staff workload		Informant 1: High document volumes hinder medical record completeness reviews and coding processes.
Method	SOP Updates		Informants 1 and 6: The coding SOP was last issued in 2020 and has not been updated.
	Accuracy in determining obstetric codes		Informant 1 (Casemix Officer): There are still cases that require a review in determining the code, such as failed induction cases, emergency cesarean sections, and the use of codes O98–O99 that need to be adjusted according to the patient's diagnosis or comorbid conditions.
Machine	Electronic medical record system		Informants 1 and 2: Delays in the eMedical system hinder patient data retrieval for medical record review and coding.
	Hybrid system and document scanning		Informants 1 and 2: The hybrid medical record system requires manual scanning of some BPJS claim documents, resulting in missing or unuploaded documents.
Material	Completeness of medical resumes		Informant 2: Medical resumes sometimes lack complete procedural indications, including maternal or fetal indications for cesarean sections following failed induction.
	Completeness of the examination results Documentation of actions and therapies		Informants 3–4: Ultrasound, CTG, and laboratory results are not always fully documented; oligohydramnios cases may lack ultrasound results or AFI values. Informants 3–4: Documentation of actions and therapies remains incomplete, including missing fluid administration or rehydration observation sheets in HEG cases with dehydration.
Money	Training budget support		Informant 6: Training budgets are available, but specialized obstetric coding

training has not been conducted, so competency development remains necessary.

Source: Primary data, 2026

The 5M analysis identified Material, Man, and Method as the most prominent factors associated with obstetric diagnosis coding inaccuracies. Material was reflected in incomplete clinical documentation, while Man involved limited specialized coding training and high workloads. Method was associated with the coding SOP, which had not been updated since 2020. Machine and Money also influenced the process through system delays, incomplete document uploads, and the need for resources to support training and quality improvement. These findings indicate that coding inaccuracies are associated with interconnected documentation, competency, and procedural issues rather than coding personnel alone.

The Man factor relates to the competence, workload, and collaboration of healthcare workers involved in the documentation and coding process. The coding staff have not received formal coding training since performing their duties, while a high workload potentially increases the risk of coding errors. Training and education for clinical staff and coding personnel have been proven to improve coding accuracy, with changes in the Healthcare Resource Group decreasing from 58.5% to 20.5% ($p < 0.0001$) after educational intervention (Radhakrishnan et al., 2024). Collaboration between doctors and coders has also been proven to improve coding accuracy. (Xu et al., 2025). These findings emphasize the importance of adequate competence and communication among healthcare professionals involved in the documentation and coding process. Analysis of the completeness of medical records and the ability to code diagnoses according to ICD-10 are also included as competencies in coding training within the National Health Insurance program.

The Method Factor is related to the procedures and guidelines used in the coding process. The Standard Operating Procedure (SOP) for Coding at the hospital was last published in 2020 and has not been updated regularly. This condition has the potential to create a gap between internal procedures and the development of coding guidelines. The coding process is influenced by factors related to coding personnel, procedures, and resource availability (Febriana et al., 2024). Continuous training, documentation standardization, collaboration, and internal audits are also important for improving coding quality (Santos et al., 2026). Therefore, regularly updating and socializing the coding SOP is very important to ensure that the coding process remains consistent with the applicable guidelines.

The Machine Factor is related to the medical record system and the technology used in the documentation and claims process. Medical records still use a hybrid model, involving documentation on physical forms that are then scanned for electronic BPJS claims. This condition has the potential to cause delays or incomplete information transfer during the coding process. The integrated documentation workflow resulted in a diagnosis and code concordance of 87.9%, compared to 44.4% in the separate workflow ($p < 0.0001$) (Hwang et al., 2024). The implementation of electronic medical records and support for data integration and interoperability is also emphasized in Ministerial Regulation Number 24 of 2022 concerning Medical Records (Kementerian Kesehatan RI, 2022). Thus, improving system integration is crucial to ensure that clinical information can be accessed completely and consistently throughout the coding and claims process.

The Material Factor relates to the completeness and quality of clinical information documented in medical records. Incompleteness is primarily found in the medical history, CPPT, medical resume, ultrasound results, laboratory results, and medication administration documentation. The lack of this information can make it difficult for coders to determine the correct and specific code. A relationship between the completeness of diagnostic documentation and coding accuracy among ob-gyn patients has also been reported (Ramdhani & Gunawan, 2024). The completeness of medical information plays an important role in determining the accuracy of diagnosis codes, as incomplete clinical information can limit the coder's ability to assign the appropriate code (Suryandari et al., 2025). Thus, the use of an electronic system alone does not guaranty coding accuracy if the clinical information used as the basis for coding remains incomplete.

The Money Factor is related to the availability of financial resources to support quality improvement activities. The hospital has provided a training budget, but its limitations have resulted in suboptimal or unsustainable coding training. Financial resources are also needed to support system integration, SOP updates, coding audits, monitoring, and evaluation. The availability of software, quality support, and internal audits have been identified as part of efforts to improve the quality of the coding process (Santos et al., 2026). Therefore, adequate resource allocation is necessary to ensure that quality improvement activities can be carried out sustainably.

Overall, the 5M analysis shows that the incompleteness of medical records and the inaccuracy of obstetric diagnosis codes are not only caused by coding personnel but are the result of the interaction between Man, Method, Machine, Material, and Money. Improvements therefore need to be implemented comprehensively through continuous training, regular updates and socialization of SOPs, stronger communication between clinical staff and coders, better clinical documentation, better integration of electronic medical records, and regular coding audits and evaluations.

4. CONCLUSION

The research results show that medical record completeness for BPJS obstetric cases was not optimal, with 92 files (38%) complete and 152 files (62%) incomplete. The most frequent deficiencies involved diagnosis completeness and consistency, treatment and medication documentation, anamnesis, supporting examination results, CPPT, medical resumes, and management documentation. Informed consent was documented in all reviewed files.

Obstetric diagnosis coding accuracy reached 56.97% (139 files), while 43.03% (105 files) had inaccurate codes. The inaccuracies were associated with insufficient code specificity, discrepancies between clinical documentation and assigned codes, and incomplete diagnostic information.

The main contribution of the 5M approach is its integrated explanation of how human competence and workload (Man), coding procedures and SOPs (Method), information systems (Machine), clinical documentation (Material), and financial resources (Money) interact in relation to medical record completeness and coding accuracy. This approach indicates that these issues cannot be addressed through coding staff improvements alone but require coordinated interventions across documentation, procedures, technology, and resource support. Therefore, improvements should prioritize clinical documentation completeness, specialized coding training, regular SOP updates, better system integration, and routine coding audits to support accurate and accountable BPJS claims.

Future research should evaluate the effectiveness of targeted interventions, such as specialized obstetric coding training, standardized clinical documentation, updated coding SOPs, improved electronic medical record integration, and routine coding audits. A pre- and post-intervention design could be used to compare medical record completeness and coding accuracy before and after implementation. Further studies involving multiple hospitals and longer observation periods are also recommended to assess the sustainability and generalizability of these improvements in the BPJS claims process.

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