

Implementation of a Medical Coding Mentorship Program to Reduce BPJS Health Insurance Pending Claims at Sandi Karsa Hospital, Makassar

Agustina^{1*}, Lilik Meilany¹, Asriyanti¹, Rosana Dwiyantri Putri¹

¹ D3 Medical Records and Health Information Study Program, STIKES Panakkukang Makassar, South Sulawesi, Indonesia

Received: 05 January 2026

Revised: 05 February 2026

Accepted: 20 February 2026

Published: 02 March 2026

ABSTRACT

Background: In Indonesia's National Health Insurance (JKN) system, the accuracy of medical coding plays a critical role in determining claim approval and reimbursement through the Indonesia Case Base Groups (INA-CBGs) payment mechanism. Inaccurate coding of diagnoses and procedures often results in pending BPJS Health claims, leading to delayed payments and increased administrative burden for hospitals. This community service activity aimed to implement and evaluate a mentoring program designed to improve medical coding practices and reduce pending BPJS Health claims at Sandi Karsa Hospital, Makassar.

Methods: The program was conducted from August to October 2025 using a participatory and problem-solving approach. The activities included initial assessment of pending claims, theoretical training on ICD-10 and ICD-9-CM coding principles, case-based simulations using actual medical records, direct on-site mentoring during coding processes, and the development of a Standard Operating Procedure (SOP) for medical coding. Program evaluation was performed by comparing the number of pending claims related to coding errors before and after the intervention and by observing improvements in coding practices.

Results: Prior to the intervention, 85 cases of pending claims were identified as being caused by coding rule errors. After the mentoring program was implemented, the number decreased to 34 cases, representing a reduction of approximately 60%. In addition, qualitative improvements were observed in the consistency of determining principal and secondary diagnoses, the accuracy of ICD-10 and ICD-9-CM code selection, and the overall quality of claim documentation.

Conclusion: The mentoring-based intervention effectively improved medical coding accuracy and reduced BPJS pending claims at the hospital. Continuous training, regular coding audits, and the implementation of standardized coding procedures are recommended to sustain these improvements and support more efficient hospital claim management.

Keywords: medical coding, mentoring program, pending claims, BPJS Health, hospital claim management.



*Corresponding Author.

Agustina, D3 Medical Records and Health Information Study Program, STIKES Panakkukang Makassar, South Sulawesi, Indonesia

Email: agustinaharuna@gmail.com



INTRODUCTION

The implementation of Indonesia's National Health Insurance program (Jaminan Kesehatan Nasional/JKN) applies a case-based payment system known as Indonesia Case Base Groups (INA-CBGs). Within this system, the accuracy of diagnosis and procedure coding plays a crucial role because it determines the grouping of cases and the reimbursement value claimed by hospitals (Amalia et al., 2023). Medical coding therefore becomes a critical component in hospital claim management. Inaccurate coding practices, including errors in determining the principal diagnosis, secondary diagnoses, or medical procedures, frequently result in claims being categorized as pending (Anton Susanto et al., 2025). This situation may lead to delays in reimbursement, increased administrative workload, and potential disruptions in the financial flow of healthcare facilities (Arkoudis et al., 2025).

In the JKN system, pending claims refer to claims that require further clarification or verification by BPJS Kesehatan due to discrepancies in documents, incomplete administrative requirements, or non-compliance with clinical standards and regulations. According to the Regulation of the Board of Directors of BPJS Kesehatan No. 19 of 2023 concerning Health Service Claim Management, the causes of pending claims are generally classified into three main categories: coding rules, service standards, and regulatory compliance (Cromeens et al., 2024). Among these factors, inaccuracies in medical coding are one of the most frequently identified causes during the verification process. Coding-related problems commonly involve inconsistencies between clinical documentation and the selected diagnosis codes, incorrect determination of the principal diagnosis, and inadequate application of morbidity coding rules (Daroedono et al., 2025).

Similar issues have also been identified at Sandi Karsa Hospital in Makassar. Internal evaluations conducted by the hospital indicated that the proportion of pending claims between April and June 2025 remained relatively high for both outpatient and inpatient services. In April 2025, the percentage of pending claims reached 18.7%, increasing to 21.7% in May and slightly decreasing to 21.2% in June. Further analysis revealed that a substantial portion of these pending claims was associated with inaccuracies in the application of coding rules for diagnoses and procedures. Additional issues included inconsistencies between the principal diagnosis and the medical resume as well as variations in coders' understanding and interpretation of coding guidelines (Indawati, 2019).

Previous studies have consistently reported that the accuracy of medical coding is strongly associated with the success of claim submissions in case-based payment systems (Lam et al., 2025). Errors in identifying principal diagnoses or comorbidities can alter the classification of INA-CBG groups and consequently affect the reimbursement value received by hospitals (Istianingsih et al., 2025). Other research has highlighted that the use of precise medical terminology in clinical documentation significantly influences the accuracy of diagnostic codes assigned by medical coders (Paoli & Joseph Cox, 2024). Therefore, strengthening coder competencies through case-based training, regular coding audits, and the implementation of standardized operating procedures has been widely recommended as an effective strategy to improve coding quality (Patel et al., 2026).

Despite these efforts, a gap often remains between theoretical knowledge of coding standards and their practical implementation in daily hospital workflows. Medical coders frequently encounter complex clinical cases, incomplete documentation, and varying interpretations of coding guidelines. In addition, the absence of clear and practical operational guidelines can lead to inconsistencies in coding practices across staff members. These challenges indicate the need for practical capacity-building programs that not only enhance theoretical understanding but also provide hands-on mentoring and real-case learning experiences.

In response to these challenges, a community service program was designed to strengthen the capacity of medical coding staff through a structured mentoring approach. The intervention consisted of theoretical training sessions, case-based simulations, direct on-site coding assistance, and the

development of a Standard Operating Procedure (SOP) for coding practices accompanied by morbidity coding rule handouts. This approach aims to bridge the gap between theory and practice while fostering a more standardized and systematic coding workflow within the hospital claim management unit. Therefore, the objective of this community service activity is to describe the implementation of a mentoring program for medical coders and to evaluate its impact on reducing BPJS Health pending claims at Sandi Karsa Hospital, Makassar.

METHOD of IMPLEMENTATION

Component	Description
Location of Activity	The community service program was conducted at Sandi Karsa Hospital, Makassar, Indonesia, from August to October 2025. The hospital was selected based on the identified problem of a relatively high number of BPJS Health pending claims related to medical coding inaccuracies.
Target Participants	The primary target participants were medical coding officers and members of the hospital claim management team. A total of eight staff members with educational backgrounds in medical record and health information management participated in the activity.
Problem Identification	The initial stage involved identifying the root causes of pending BPJS claims through document review and preliminary observation. Pending claims were classified based on coding rules, service standards, and regulatory issues, with a specific focus on coding-related problems.
Program Preparation	Preparation included coordination with hospital management, preparation of training materials on ICD-10 and ICD-9-CM coding guidelines, development of case-based simulation materials, and planning of mentoring sessions.
Training and Education	The program provided theoretical training sessions covering principles of determining principal and secondary diagnoses, application of ICD-10 and ICD-9-CM coding standards, and morbidity coding rules. The training was delivered through lectures, interactive discussions, and problem-solving sessions.
Case-Based Simulation	Participants were engaged in case-based simulations using real medical record examples. This activity aimed to improve practical coding skills by allowing participants to analyze cases, determine appropriate codes, and discuss the rationale for coding decisions.
On-site Mentoring	Direct mentoring was conducted during the actual coding process. Participants received guidance and feedback while performing coding tasks, enabling immediate correction of errors and reinforcement of correct coding practices.
Development of SOP	As part of the sustainability strategy, a Standard Operating Procedure (SOP) for medical coding and morbidity coding rules handouts were developed and implemented as daily reference materials for coding staff.
Evaluation Indicators	Program evaluation used both quantitative and qualitative indicators. Quantitatively, the number of pending claims due to coding errors before and after the intervention was compared. Qualitatively, improvements in coding consistency, accuracy of principal diagnosis determination, documentation quality, and participant feedback were assessed.
Success Criteria	The program was considered successful if there was a measurable reduction in pending claims related to coding errors, improved coding accuracy among participants, and adoption of standardized coding procedures within the hospital claim management unit.

RESULT

The community service program aimed at improving the competence of medical coding officers and reducing BPJS Health pending claims at Sandi Karsa Hospital, Makassar, was implemented from August to October 2025. The program consisted of several stages, including problem identification, theoretical training, case-based simulations, on-site mentoring, and the development of a Standard Operating Procedure (SOP) for medical coding. The results of the program were evaluated using both quantitative and qualitative indicators.

Distribution of Pending Claims Before the Intervention

Initial analysis of hospital claim data showed that pending claims were still relatively high. In September 2025, a total of 216 pending claim cases were recorded. These cases were categorized based on the causes of pending claims, including coding rules, service standards, and regulatory issues.

Table 1. Presents the distribution of pending claims before the implementation of the mentoring program.

Category	Number of Cases	Percentage
Coding Rules	85	39%
Service Standards	122	57%
Regulation	9	4%
Total	216	100%

The data indicate that coding-related issues accounted for 39% of the total pending claims. This finding suggests that inaccuracies in determining principal diagnoses, secondary diagnoses, and procedure codes contributed significantly to the occurrence of pending claims. These results reinforced the need for targeted interventions to strengthen the competence of medical coders.

Distribution of Pending Claims After the Intervention

Following the implementation of training, case-based simulation, and direct mentoring, an evaluation was conducted using claim data from October 2025. The total number of pending claim cases recorded in October was 228. Although the total number of submitted claims increased, the proportion of pending claims related to coding rules decreased substantially.

Table 2 Shows the distribution of pending claims after the intervention.

Category	Number of Cases	Percentage
Coding Rules	34	15%
Service Standards	160	70%
Regulation	34	15%
Total	228	100%

The results demonstrate that the number of pending claims caused by coding rule errors decreased from 85 cases in September to 34 cases in October. This represents a reduction of 51 cases, or approximately 60%. The findings indicate that the mentoring and training program contributed significantly to improving coding accuracy and reducing claim delays related to coding errors.

In addition to the quantitative results, qualitative improvements were observed during the implementation of the program. Medical coders demonstrated better consistency in determining principal and secondary diagnoses based on morbidity coding rules. Participants also showed improved ability to select appropriate ICD-10 and ICD-9-CM codes according to clinical documentation.

The implementation of the newly developed Standard Operating Procedure (SOP) for coding further supported the standardization of coding practices. The SOP provided clear guidelines for determining diagnoses, verifying documentation, and applying coding rules. As a result, coding staff reported increased confidence and efficiency in performing their daily tasks. The mentoring activities included several practical sessions such as case discussions, coding simulations using actual medical records, and direct supervision during coding processes. Participants actively engaged in discussions and received immediate feedback on coding decisions. This interactive learning approach helped reduce repetitive errors and strengthened practical coding competencies among staff members. Overall, the results of this community service program demonstrate that a structured mentoring approach combining theoretical training, practical simulations, and standardized procedures can effectively reduce pending claims related to medical coding errors and improve the quality of hospital claim management.

DISCUSSION

The implementation of the mentoring program for medical coding officers at Sandi Karsa Hospital demonstrated measurable improvements in both coding practices and claim management outcomes. The results showed a significant reduction in pending BPJS Health claims related to coding rule errors,

decreasing from 85 cases in September to 34 cases in October 2025. This reduction of approximately 60% indicates that structured mentoring, combined with theoretical training and practical simulations, can effectively improve the accuracy of medical coding and reduce claim processing delays (Sari et al., 2025).

Medical coding plays a critical role in hospital reimbursement systems that apply case-based payment mechanisms such as the Indonesia Case Base Groups (INA-CBGs). Accurate determination of the principal diagnosis, secondary diagnoses, and procedures directly influences case grouping and reimbursement value (Situmorang et al., 2025). Errors in coding may lead not only to claim rejections or pending status but also to financial inefficiencies for healthcare institutions. Previous studies have emphasized that inaccurate coding is often associated with inconsistencies between clinical documentation and assigned codes, limited coder competencies, and inadequate understanding of coding rules (Stevens et al., 2024).

The findings of this community service activity are consistent with previous research highlighting the importance of training and continuous professional development for medical coders (Susilo et al., 2025). Case-based learning methods have been shown to improve analytical skills in identifying principal diagnoses and comorbidities, particularly when supported by direct mentoring and feedback. Through the simulation of real medical record cases, participants in this program were able to strengthen their understanding of ICD-10 and ICD-9-CM coding principles and apply morbidity coding rules more consistently in practice (Tresh et al., 2024).

Another important outcome observed during the program was the improvement in consistency when determining principal and secondary diagnoses. Before the intervention, coding decisions were often influenced by varying interpretations of clinical documentation (Tubishat et al., 2025). After the mentoring sessions, coders demonstrated a more systematic approach in reviewing medical records and identifying the most appropriate codes. This improvement suggests that mentoring not only enhances technical knowledge but also promotes critical thinking and standardized decision-making in coding practices (Vaccari et al., 2026).

The development and implementation of a Standard Operating Procedure (SOP) for medical coding also contributed significantly to the sustainability of the program outcomes. Standardized procedures provide a practical reference that helps ensure consistency across different staff members and reduces variability in coding practices (Mmonu et al., 2024). In healthcare management, the establishment of clear operational guidelines is widely recognized as an effective strategy to maintain service quality and improve organizational efficiency. The SOP developed during this program therefore serves as an important institutional tool to support long-term improvements in coding accuracy and claim management (Winarsih et al., 2024).

Beyond technical improvements, the program also generated positive organizational impacts within the hospital claim management unit. Increased awareness among coding officers regarding the importance of accurate coding in the JKN reimbursement system contributed to a stronger culture of accountability and professionalism. Staff members became more attentive to the completeness and clarity of clinical documentation, recognizing that documentation quality directly affects the accuracy of coding and the success of claim submissions. From a broader perspective, the results of this activity demonstrate the value of collaborative capacity-building initiatives between educational institutions and healthcare providers. Community service programs conducted by academic institutions can serve as an effective mechanism for transferring knowledge and improving practical competencies among healthcare professionals. In this case, the mentoring approach helped bridge the gap between theoretical knowledge of coding standards and their application in real-world clinical documentation and claim processes.

The impact of this program extends beyond the immediate reduction of pending claims. Improved coding accuracy contributes to faster claim verification processes, more efficient financial management,

and reduced administrative burden for hospital staff. These improvements ultimately support the sustainability of hospital operations within the national health insurance system. In the long term, strengthening coding competencies may also contribute to improved health data quality, which is essential for healthcare planning, policy development, and epidemiological analysis.

Despite the positive outcomes observed, several challenges were encountered during the implementation of the program. Variations in case complexity, limited mentoring time, and the quality of clinical documentation from healthcare providers occasionally affected the coding process. These challenges highlight the importance of continuous training, interdisciplinary collaboration, and regular internal coding audits to maintain the improvements achieved through this program. Overall, the mentoring-based intervention implemented in this community service activity proved to be an effective strategy for enhancing coder competence and reducing pending BPJS claims related to coding errors. Continuous monitoring, periodic training programs, and strengthening coordination between clinical staff and coding personnel are recommended to sustain and further improve the quality of coding and claim management in hospitals.

CONCLUSION

The community service program focusing on mentoring medical coding officers at Sandi Karsa Hospital, Makassar, demonstrated a positive impact on improving coding accuracy and reducing BPJS Health pending claims. The combination of theoretical training, case-based simulations, direct mentoring, and the development of a Standard Operating Procedure (SOP) strengthened the competencies of coding staff and improved the consistency of applying ICD-10 and ICD-9-CM coding rules. Quantitatively, the number of pending claims related to coding errors decreased from 85 cases to 34 cases, representing a reduction of approximately 60% after the intervention. This improvement indicates that structured mentoring and practical training are effective strategies for enhancing the quality of hospital claim management. To sustain these improvements, hospitals are encouraged to implement regular coding audits, continuous professional training, and stronger coordination between clinical staff and coding officers to ensure the completeness and accuracy of medical documentation. Future programs may also expand mentoring activities and integrate digital learning tools to further strengthen coding competencies and support more efficient claim management within the National Health Insurance system.

ACKNOWLEDGEMENTS

The authors would like to express their sincere appreciation to the management and medical coding staff of Sandi Karsa Hospital, Makassar, for their active participation and support during the implementation of this community service program. Appreciation is also extended to STIKES Panakkukang Makassar for providing institutional and academic support that made this activity possible.

References

- Amalia, R., Lestari, S., Ferdianto, A., Akbar, P. S., & Fardilan, N. (2023). Determinan Pengembalian Berkas Klaim Berdasarkan Akurasi Kode Diagnosis Pasien Rawat Inap BPJS Kesehatan di RSI Sultan Agung Semarang). *Jurnal Rekam Medis Dan Informasi Kesehatan*, 6(2), 98–104. <https://doi.org/10.31983/jrmik.v6i2.10633>
- Anton Susanto, Galih Maheswari Candraningtyas, & Agus Trijono. (2025). Akurasi Pengkodean Diagnosis dan Prosedur Medis serta Implikasinya terhadap Klaim JKN di RSUD Pandan Arang. *Jurnal Ilmiah Kedokteran Dan Kesehatan*, 4(3), 306–317. <https://doi.org/10.55606/klinik.v4i3.4610>
- Arkoudis, N.-A., Tavernaraki, K., Moschovaki-Zeiger, O., Balomenos, V., Velonakis, G., Papakonstantinou, O., Filippiadis, D., Alexopoulou, E., Kelekis, N., & Spiliopoulos, S. (2025). Education and training satisfaction among radiology residents: Insights from a national survey. *European Journal of Radiology*, 189, 112191. <https://doi.org/10.1016/j.ejrad.2025.112191>
- Cromeens, M. G., Knafl, K., Robinson, W. R., Carey, E. T., Haji-Noor, Z., & Thoyre, S. (2024). Endometriosis and Disability: Analysis of Federal Court Appeals of Social Security Disability Insurance and Supplemental Security Income Claims by Individuals Suffering From Endometriosis. *Women's Health Issues*, 34(3), 221–

231. <https://doi.org/10.1016/j.whi.2023.11.008>
- Daroedono, E., Aurellita, N., Saverio, I., Sirait, G. P., Imanuel, R., & Kuheba, E. G. (2025). The Curative Role of the Main Primary Health Facility in Indonesia: Analyzing Patient Visits at a Single PUSKESMAS with a Focus on General and Maternal-Child Health Clinics. *Asian Journal of Research in Medical and Pharmaceutical Sciences*, 14(2), 68–78. <https://doi.org/10.9734/ajrimps/2025/v14i2306>
- Indawati, L. (2019). Analisis Akurasi Koding Pada Pengembalian Klaim BPJS Rawat Inap Di RSUP Fatmawati Tahun 2016. *Jurnal Manajemen Informasi Kesehatan Indonesia*, 7(2), 113. <https://doi.org/10.33560/jmiki.v7i2.230>
- Istianingsih, N., Mudiono, D. R. P., Rachmawati, E., & Suyoso, G. E. J. (2025). Analysis of Factors Causing Pending BPJS Inpatient Claims at dr. H. Koesnadi General Hospital, Bondowoso. *International Journal of Healthcare and Information Technology*, 2(2), 89–99. <https://doi.org/10.25047/ijhitech.v2i2.6165>
- Lam, B. C., Chen, J., & Ku, H. B. (2025). Biopower, governmentality and the making of health inequities of migrant domestic workers in Hong Kong. *Social Science & Medicine*, 383, 118449. <https://doi.org/10.1016/j.socscimed.2025.118449>
- Mmonu, N., Kamdar, N., Roach, M., Sarma, A., Makarov, D., Zabar, S., & Breyer, B. (2024). Disparities in the Delivery of Prostate Cancer Survivorship Care in the USA: A Claims-based Analysis of Urinary Adverse Events and Erectile Dysfunction Among Prostate Cancer Survivors. *European Urology Open Science*, 62(2), 26–35. <https://doi.org/10.1016/j.euros.2024.01.003>
- Paoli, L., & Joseph Cox, L. T. (2024). Across the spectrum of legality: The market activities of influencers specialized in steroids and other performance and image enhancing drugs. *International Journal of Drug Policy*, 123, 104246. <https://doi.org/10.1016/j.drugpo.2023.104246>
- Patel, V., Kalita, A., Furtado, K. M., Mor, N., Bhadada, S., Albert, S., Ashraf, H., Balsari, S., Bhushan, I., Chandru, V., Chatterjee, M., Chaturvedi, S., Dharmaraju, R., Gupta, A., Mazumdar-Shaw, K., Menon, G. I., Mukherji, A., Muttreja, P., Nambiar, A., ... Khanna, T. (2026). The Lancet Commission on a citizen-centred health system for India. *The Lancet*, 407(10526), 388–468. [https://doi.org/10.1016/S0140-6736\(25\)02169-5](https://doi.org/10.1016/S0140-6736(25)02169-5)
- Sari, A. N., Syaodih, E., & Lestari, Y. (2025). Evaluasi Implementasi Pengelolaan Piutang BPJS di BLUD Rumah Sakit Umum Daerah Provinsi Nusa Tenggara Barat. *Journal of Business, Finance, and Economics (JBFE)*, 6(2), 261–270. <https://doi.org/10.32585/jbfe.v6i2.7697>
- Situmorang, B. A., Aziz, A., & Hutapea, F. (2025). Analysis of Factors Causing Pending BPJS Health Claims for Inpatients at Kartika Husada Setu Hospital in 2024. *International Journal of Business, Law, and Education*, 6(1), 549–555. <https://doi.org/10.56442/ijble.v6i1.1051>
- Stevens, P. E., Ahmed, S. B., Carrero, J. J., Foster, B., Francis, A., Hall, R. K., Herrington, W. G., Hill, G., Inker, L. A., Kazancioğlu, R., Lamb, E., Lin, P., Madero, M., McIntyre, N., Morrow, K., Roberts, G., Sabanayagam, D., Schaeffner, E., Shlipak, M., ... Levin, A. (2024). KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney International*, 105(4), S117–S314. <https://doi.org/10.1016/j.kint.2023.10.018>
- Susilo, D., Wulandari, L. P. L., Sukmayeti, E., Asante, A., Jan, S., Thabrany, H., Tangcharoensathien, V., Wiseman, V., & Liverani, M. (2025). Can Indonesia achieve universal health coverage? Organisational and financing challenges in implementing the national health insurance system. *SSM - Health Systems*, 5(1), 100138. <https://doi.org/10.1016/j.ssmhs.2025.100138>
- Tresh, A. S., Del Giudice, F., Li, S., Basran, S., Belladelli, F., De Berardinis, E., Asero, V., Ferro, M., Tataru, S., Maria Busetto, G., Falagario, U., Autorino, R., Crocetto, F., Barone, B., Pradere, B., Moschini, M., Mari, A., Krajewski, W., Nowak, Ł., ... Chung, B. I. (2024). The Impact of Venous Thromboembolism on Upper Tract Urothelial Carcinomas Undergoing Open or Minimally Invasive Radical Nephroureterectomy in the USA: Perioperative Outcomes and Health Care Costs from Insurance Claims Data. *European Urology Focus*, 10(2), 317–324. <https://doi.org/10.1016/j.euf.2024.02.004>
- Tubishat, M., Tbaishat, D., Al-Zoubi, A. M., Hraiz, A.-E., & Habib, M. (2025). Leveraging evolutionary algorithms with a dynamic weighted search space approach for fraud detection in healthcare insurance claims. *Knowledge-Based Systems*, 317(6), 113436. <https://doi.org/10.1016/j.knosys.2025.113436>
- Vaccari, E. M., Agre, K. E., Williams, T. J., Krempely, K. E., Ting, Y.-L., & Esplin, E. D. (2026). Insurance Coverage Of Cardiomyopathy Genetic Testing Stratified By Insurance Types And Cardiomyopathy Subtype. *Journal of Cardiac Failure*, 32(1), 200. <https://doi.org/10.1016/j.cardfail.2025.11.068>
- Winarsih, S. A., Widjanarko, B., & Agushyana, F. (2024). The Impact of Electronic Medical Records on BPJS Claims and Physician Performance. *Jurnal Indonesia Sosial Teknologi*, 5(8), 3678–3690. <https://doi.org/10.59141/jist.v5i8.1207>