Workforce Gaps in Medical Record Personnel Across Healthcare Facilities in Bali Province: Evidence and Policy Implications

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ABSTRACT

Medical Record and Health Information (MRHI) professionals are recognized as part of the healthcare workforce as stipulated in Law Number 17 of 2023. The implementation of Electronic Medical Records (EMR), mandated through Minister of Health Regulation Number 24 of 2022, requires the availability of competent MRHI personnel in every healthcare facility. This study aims to analyze the gap between the demand for and availability of MRHI professionals in Bali Province.

This research employed a descriptive-exploratory approach using secondary data from the Central Bureau of Statistics (BPS), Bali Provincial Health Profile, and the Higher Education Database (PD-DIKTI) for 2024. The estimation of demand was calculated based on the number and type of healthcare facilities and the standard staffing requirements for MRHI professionals. The findings show that the estimated demand reached 1,020 professionals, while the annual availability of graduates who are eligible to work and possess a registration license (STR) is projected to be only around 230 individuals.

This gap highlights the urgent need for structured and data-driven health workforce planning. The results of this study may serve as a basis for policy formulation in education, workforce distribution, and the strengthening of digital health service systems at the regional level.

KEYWORDS

Medical Record and Health Information; Electronic Medical Records; Health Workforce Planning; Human Resources Gap

INTRODUCTION

Medical record and health information personnel are an essential part of a modern healthcare system. According to the Ministry of Health Regulation No. 55 of 2013, medical record personnel are responsible for managing patient health information, preparing service reports, submitting claims for financing, and supporting managerial decision-making [1]. Law No. 17 of 2023 concerning Health stipulates that medical record personnel are included in the group of professional healthcare workers required to hold a Registration Certificate (STR) in order to legally work in healthcare facilities [2].

National policy through Ministry of Health Regulation No. 24 of 2022 mandates that all healthcare facilities implement electronic medical records no later than December 31, 2023, which directly increases the demand for trained and certified medical record personnel [3]. Implementing electronic medical records requires not only administrative staff but also professionals with an understanding of information systems, medical ethics, and health law.

Bali Province has more than 550 healthcare facilities, including hospitals, community health centers (puskesmas), and primary or main clinics [4][5]. Each facility requires at least one medical record personnel, and hospitals with multiple service units require even more. This indicates that a high number of facilities or units directly reflects a high demand for medical record personnel.

Bali Province still faces challenges in meeting the quantitative and distributional needs of medical record personnel. There are only five study programs producing medical record graduates: STIKES Wira Medika (D3), Universitas Dhyana Pura (S1 and Applied Bachelor), Politeknik Kesehatan Kartini Bali (D4), and Universitas Bali Internasional (S1). Assuming each program graduates an average of 40 students per year, only around 200 graduates are produced annually. Of these, only D3 and D4 graduates (approximately 120 individuals) can immediately obtain STR after passing the competency test [6].

This situation demonstrates a clear gap between the high number of healthcare facilities, which creates a large demand for personnel, and the limited number of graduates, not all of whom can legally work immediately. The problem is that there has been no comprehensive mapping of the gap between the demand and availability of medical record personnel in Bali Province, particularly those already holding STR. This study aims to analyze the distribution gap of medical record personnel in healthcare facilities in Bali Province based on 2024 secondary data. The results are expected to provide a basis for policy considerations in the planning and distribution of health human resources by educational institutions, local governments, and healthcare facility managers.

RESEARCH METHOD

This study employed a descriptive exploratory approach based on secondary data. Data sources were obtained from official publications such as the Central Statistics Agency (BPS) and the 2024 Health Profile of the Bali Provincial Health Office. Since data on the number of medical record personnel graduates in Bali Province is not publicly available, an estimative approach based on national data from the Higher Education Database (PD Dikti) was used. As of 2024, the total number of graduates from the Study Programs of Health Records and Information, Medical Records and Health Information, and Health Information Management nationwide exceeded 41,000. Assuming approximately 5.5% of these programs are located in Bali, the estimated annual number of graduates in the province reaches around 230 individuals. This estimate was used to compare availability with the demand for medical record personnel in healthcare facilities.

The analysis was conducted by comparing the number of healthcare facilities in Bali Province with the standard staffing requirements for medical record personnel, as well as the number of graduates holding a Registration Certificate (STR). Staffing standards refer to Ministry of Health Regulation No. 81 of 2013 for primary healthcare facilities and the hospital accreditation guidelines (SNARS) for referral facilities. It is assumed that one personnel is required for each primary healthcare facility, whereas hospitals require more than one personnel depending on the complexity of services.

RESULT AND DISCUSSION

The distribution of healthcare facilities in Bali Province shows significant variation across regions. This affects the demand for medical record personnel, which is also uneven. Complete data can be seen in Table 1.

Table 1. Number of healthcare facilities by regency/city in Bali Province based on 2024 BPS data

City	General Hospital	Specialty Hospital	Inpatient Community Health Center	Outpatient Community Health Center	Primary Clinic.
Jembrana	4	0	6	4	6
Tabanan	7	-	5	15	16
Badung	11	2	-	13	64
Gianyar	8	-	-	13	32
Klungkung	5	-	3	6	20
Bangli	2	1	5	7	13
Karangasem	4	-	7	5	15
Buleleng	9	-	4	16	12
Denpasar	15	7	30	90	69
Total in Bali	65	7	30	90	247

Based on data from the Central Statistics Agency (BPS) of Bali Province in 2024, the number of healthcare facilities across all regencies/cities in Bali consists of 65 general hospitals, 7 specialty hospitals, 30 inpatient community health centers, 90 outpatient community health centers, and 247 primary clinics. Assuming that each healthcare facility requires at least one medical record personnel, the minimum need for medical record personnel is 439 individuals. This number does not yet include the additional needs in hospitals, which generally require more than one medical record personnel depending on service complexity and patient visit volume (Bali Provincial Health Profile, 2024; BPS Bali Province, 2024).

To project the demand for medical record personnel in Bali Province, an estimation was conducted based on the number of healthcare facilities and the minimum staffing standards set by technical regulations. Ministry of Health Regulation No. 81 of 2013 recommends at least one medical record personnel in primary healthcare facilities such as community health centers and clinics. Meanwhile, hospitals as referral facilities require more than one medical record personnel depending on the complexity of services and inpatient capacity. The estimated number of personnel needs based on this approach is presented in Table 2 below.

Table 2. Estimated Need for Medical Record Personnel by Type of Healthcare Facility in Bali. Data from the Bali Provincial Health Profile 2024

Healthcare Facility	Total	Estimated Personnel per Unit	Total Requirement
General Hospital	64	5	320
Specialty Hospital	16	5	80
Inpatient Community Health Center	30	2	60
Outpatient Community Health Center	90	1	90
Primary Clinic	240	1	240
Advanced Clinic	115	2	230
TOTAL	555	16	1020

Aggregate data from the Bali Provincial Health Profile shows a total of 65 general hospitals, 7 specialty hospitals, 30 inpatient community health centers, 90 outpatient community health centers, and 115 main clinics—there is a minor discrepancy in the number of primary clinics (BPS records 247, while the profile mentions 240), possibly due to differences in definitions or data collection periods. Nevertheless, the data is overall consistent and provides an overview that the minimum need for medical record personnel in primary healthcare facilities in Bali exceeds 550 staff, and is significantly higher when considering the intensive needs in hospitals.

This estimated need was developed using a regulation-based and standard practice approach. For primary healthcare facilities, such as community health centers and clinics, the main reference is Ministry of Health Regulation No. 81 of 2013 concerning Technical Guidelines for the Functional Position of Medical Record and Health Information Personnel, which recommends at least one medical record personnel per unit. Hospitals, as referral facilities, have higher service complexity and patient volume, and are therefore assumed to require an average of five medical record personnel per unit. This assumption also aligns with hospital accreditation standards under the National Hospital Accreditation Standards (SNARS) Edition 1.1.

Main clinics have a broader scope of services and more complex documentation requirements compared to primary clinics; this estimation assumes the need for two medical record personnel per unit. Primary healthcare facilities, in this context, include inpatient community health centers, outpatient community health centers, and primary clinics. Inpatient community health centers are assumed to require two medical record personnel due to 24-hour and inpatient services, whereas outpatient community health centers are counted as one staff member due to their more limited functions (Ministry of Health, 2013; KARS, 2018).

In efforts to meet the need for competent medical record personnel in healthcare facilities, higher education institutions play a strategic role as the primary providers of human resources in Health Information Management. Several universities in Bali Province have established study programs in Medical Records and Health Information, at diploma, bachelor's, and applied bachelor's levels. These programs directly contribute to producing graduates who can fill medical record personnel positions in accordance with national competency standards.

The list of higher education institutions offering study programs in Medical Records and Health Information Management in Bali Province can be seen in the following table.

Table 3. Study Programs Producing Medical Record Personnel Graduates in Bali Province

Prodi Lulusan Rekam Medis di Bali	Education level
STIKES Wira Medika Bali – Rekam Medis dan Informasi Kesehatan	D3
Politeknik Kesehatan Kartini Bali – Manajemen Informasi Kesehatan	D4
Universitas Dhyana Pura – Manajemen Informasi Kesehatan	SARJANA TERAPAN/D4
Universitas Dhyana Pura – Rekam Medis dan Informasi Kesehatan	S1
Universitas Bali Internasional – Manajemen Informasi Kesehatan	S1

Data from the Higher Education Database (PDDikti) in 2024 indicates that the total number of graduates from the Study Programs in Health Records and Information, Medical Records and Health Information, and Health Information Management nationwide has exceeded 41,000 individuals. The estimated distribution of study programs in Bali is approximately 5.5% of the total, or roughly 230 graduates per year. However, not all of these graduates immediately hold a Registration Certificate (STR), as they must still undergo competency testing and registration in accordance with regulatory provisions (PD Dikti, 2024; Law No. 17 of 2023 on Health).

The Health Information Management Applied Bachelor's Program at Universitas Dhyana Pura (MIK UNDHIRA), as one of the higher education institutions offering an applied bachelor's program in this field, is relatively new and has not yet produced graduates. This indicates that the supply of medical record personnel in Bali remains very limited, particularly from higher education pathways. The presence of this program is expected to serve as a medium-term solution to meet the need for competent and certified medical record personnel in Bali (UNDHIRA, 2024).

The staffing standards for medical record personnel refer to Ministry of Health Regulation No. 81 of 2013 on Technical Guidelines for the Functional Position of Medical Record and Health Information Personnel, as well as the National Hospital Accreditation Standards (SNARS) Edition 1.1. SNARS explains that hospitals require medical record personnel to ensure the quality of patient data and medical record management, as well as to support electronic-based reporting. This becomes increasingly important in the context of implementing Electronic Medical Records (EMR) as mandated by Ministry of Health Regulation No. 24 of 2022 on Electronic Medical Records. Law No. 17 of 2023 on Health further strengthens legal protection, professional recognition, and STR regulation for medical record personnel.

The descriptive exploratory approach based on secondary data, as used in this study, has also been applied in several other relevant studies. A study by Rizky et al. (2020) on the distribution of sanitarian personnel in Indonesia demonstrated that the use of secondary data from BPS and Provincial Health Profiles can provide an initial overview of the imbalance between human resource availability and actual needs in the field, particularly in primary healthcare facilities. This approach is considered effective as a basis for health HR policy planning without the need for direct surveys when primary data is not yet sufficiently available.

Another study by Dewi & Nugraheni (2021) on inequalities in health promotion personnel also used a similar method to map needs and availability through projected ideal requirements per type of facility. They emphasized the importance of validation through a combination of regulatory approaches and the capacity of educational institutions to produce ready-to-deploy graduates, which aligns with the findings in this study that only a portion of graduates can immediately work due to STR constraints.

Meanwhile, Indrawati (2022), in an analysis of the supply-demand of medical record personnel in Central Java Province, concluded that using regulation-based staffing standards (Permenkes and SNARS) can be applied to build medium-term HR fulfillment

scenarios. She highlighted that the gaps are often influenced not only by the number of graduates but also by uneven placement processes and the lack of spatially based data.

Thus, the findings of this study are consistent with previous research, indicating that a descriptive approach based on secondary data remains strategically valuable for medium-term policy development. Although it does not employ bivariate or multivariate testing, this method remains valid in an exploratory context, particularly when the research objective is to provide an initial overview and identify macro-level gaps.

Figure 1. The Health Information Management Applied Bachelor's Program

CONCLUSION

The analysis reveals a substantial discrepancy between the demand for medical record professionals and the number of available graduates in Bali Province. Based on the number of healthcare facilities in the region, the estimated need for medical record personnel is approximately 1,020 individuals, whereas the estimated number of graduates from medical record programs who are immediately eligible to obtain a Registration Certificate (STR) is only around 230 individuals per year. This estimate does not include graduates who fail the competency examination, have not yet obtained an STR, or are employed outside the province.

This situation indicates that the supply of medical record professionals remains insufficient to meet the current demand across healthcare facilities, particularly hospitals and clinics. Furthermore, the nationwide implementation of Electronic Medical Records (EMR) and hospital accreditation standards necessitate the availability of qualified medical record personnel. Such a gap poses a potential challenge to the digital transformation of healthcare services and the establishment of a reliable health data management system.

RECOMMENDATIONS

Based on the findings of this study, efforts are needed to implement data-based health human resource planning to address the gap between the demand and availability of medical record personnel in Bali Province. Local governments and relevant stakeholders need to conduct a more comprehensive needs mapping so that the recruitment and

distribution of personnel can be carried out effectively and efficiently. On the other hand, higher education institutions are expected to increase their capacity in terms of both quantity and quality of graduates, through program accreditation improvement, support for competency test completion, and the development of professional programs at the vocational level. Cross-sector collaboration between the Health Office, educational institutions, professional organizations, and healthcare facilities is also important to strengthen training systems, placement, and sustainable career development for medical record personnel. In addition, support from the government and professional associations in facilitating competency testing and the issuance of Registration Certificates (STR) is crucial, especially for new graduates and personnel in regions without a competency testing center.

STUDY LIMITATIONS

This study has several limitations that should be noted:

1. Graduate data is not specifically available for Bali Province, so an estimation approach was used based on national data and the proportion of educational institutions in Bali. This may affect the accuracy of supply figures.
2. Not all graduates automatically work in the health sector in Bali; workforce mobility to other regions cannot be precisely mapped in this study.
3. Real needs at each healthcare facility have not been validated, as this study did not involve direct surveys or interviews with facility managers.

Nevertheless, this analysis provides an initial overview that can serve as a foundation for designing policies and strategic interventions to strengthen medical record human resources in Bali Province.

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