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Original Research Article

Workload analysis of medical record and health information officers at a hospital

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ABSTRACT

Background: This research aims to analyze the workload of medical record and health information officers at hospital X. Initial observations identified several issues, such as frequent multitasking by staff, an imbalance in task distribution, leading to delays in completing tasks within the stipulated time.
Methods: The research method used is a case study with a qualitative approach. The data collection techniques used include observation and interviews.
Results: The calculating of the workforce needed for medical record and health information officers at hospital X based on workload analysis, shows that 29 officers are required, but only 20 are currently available, indicating a shortage of 9 peoples.
Conclusions: The findings of this research are expected to aid hospital management in making decisions to either recruit more officers or adopt technology to automate work processes, thereby reducing staff workload.

Keywords: Workload analysis, Medical record, Health information officers

INTRODUCTION

Health is a basic human right guaranteed by the 1945 Constitution of the Republic of Indonesia.[1] Hospitals as a health service facility, play a crucial role in delivering quality health services. In improving the quality of healthcare, hospitals must manage medical records in accordance with regulations.

A hospital is a healthcare institution that provides complete personal health services through promotive, preventive, curative and rehabilitative efforts, including inpatient, outpatient and emergency services.[1] The increasing public awareness of health has become a challenge for healthcare facilities, including hospitals, which must provide the best and high quality services. In enhancing the quality of healthcare services, hospitals are required to manage medical record according to the regulations.

Medical records are documents that provide data on patient identity, examination, treatment and other services provided to patients.[2] Medical records help maintain orderly patient administration in hospitals. In order to support patient administration and health quality, hospitals require professional and competent health resources.

Medical record and health information officers are classified under medical technical personnel.[1] The need for professional and competent health personnel, including medical record officers can be determined using workload analysis.[4]

Hospital X is a type C general hospital with a bed capacity of 103 and 16 specialist fields. It is management of patient medical records is still hybrid, meaning that some medical records are electronic, while others remain conventional or manual.

At hospital X, there are several issues related to fulfilling the needs of medical record and health information officers. One major issue is the imbalance in task distribution, leading to multitasking and excessive workload, resulting in many tasks not being completed within the stipulated time.

Based on these problems, the authors are interested in conducting a study titled "Workload Analysis of Medical Record and Health Information Officers at Hospital X" to optimize and rationalize staff performance.

The purpose of this study is to determine the appropriate number of medical records and health information staff need based on a health workforce workload analysis. This ensures that staff can work more optimally, as their tasks align with the actual workload requirements.

METHODS

This study was conducted through direct observation from January to September 2024 in the medical records unit of hospital X, a type C general hospital located in Bandung, West Java, Indonesia, with capacity of 103 and 16 specialist fields. The hospital approved the study, with the researcher having obtained permission after completing a research proposal and ethical clearance provided by the hospital.

The study employs a case study design with a qualitative approach, aimed at exploring and gaining an in-depth understanding of conditions at the research site. Data collection techniques include observation and interviews, allowing for an accurate portrayal of the actual conditions with more specific information.

The sample used is a saturated sample, where all medical records staff at hospital X are include to measure the time norms for each task performed.

RESULTS

At hospital X, the medical record and health information unit has 9 main task categories: registration; filing and distribution; emergency department data management; daily inpatient census management; inpatient data management; outpatient case mix; inpatient case mix; case mix reporting; and report processing. All of these are performed by 20 officers.

The calculating of the number of medical record and health information officers needed at hospital X, based on workload analysis, is a follows.

Determine the healthcare facilities and types of health human resources

The healthcare facilities and types of health human resources for which the requirements will be calculated are as follows in Table 1.

Table 1: Healthcare facilities and types of health human resources.

Healthcare facilities	Department	Types of health human resources
Hospital X	Medical records	Medical record and health information officers

Determine the available working time

Available working time is the time used by healthcare human resources to perform their duties and activities within a period of one year. Effective working hours range from 1.192 to 1.237 hours per year, which is rounded to 1.200 hours per year or 72.000 minutes per year. This applies to those working 5 or 6 days a week (Table 2).[5]

Table 2: Available working time.

Component	Information	Amount	Unit
Working days	6 week days/weeks	312	Day/year
Employee leave	Employment regulation	12	Day/year
National holiday	In 1 year (in calendar)	19	Day/year
Attend training	On average in 1 year	5	Day/year
Absence (sick)	On average in 1 year	12	Day/year
Working time (in 1 week)	Decision of the President of the Indonesia Republic	37,5	Hours/week
Effective working hours	Regulation of the Minister of PAN-RB	28.125	Hours/week
Working time (in 1 day)	6 working days/week	4.688	Hours/day
Available working time (days)	6 working days/week	264	Day/year
Available working time (hours)	6 working days/week	1.237	Hours/year
Available working time (rounding in hours)		1.200	Hours/year
Available working time (rounding in minutes)		72.000	Minutes/year

Source: Ministry of Health of the Indonesia Republic, 2015

Determine the workload components and time norms

Workload components refer to the types of tasks and detailed descriptions of tasks actually carried out by each

healthcare human resource, in accordance with the main duties set by the management.[5]

Time norms refer to the average time required by an educated, skilled, trained and dedicated healthcare human resource to perform tasks according to the standards set by the management.[5]

The following are the results of determining workload components and time norms based on observations and interviews conducted by the researchers in the medical records unit at hospital X (Table 3).

Calculating the workload standard

The workload standard is the volume / quantity of work over the course of 1 (one) year for each type of healthcare human resource. The formula for calculating the workload standard is as follows.[5]

$$Workload\ standard = \frac{Available\ working\ time}{Time\ norm\ per\ main\ task}$$

The results of the workload standard calculation for medical record and health information officers at hospital X are as follows given in Table 4.

Calculating the supporting task standard and supporting task factor

Supporting tasks are tasks performed to complete activities that are either directly or indirectly related to the main tasks carried out by each healthcare human resource. The supporting task factor represents the proportion of time used to complete each activity per unit of time (day/week/month/year). Therefore, the supporting task standard can be defined as a multiplier for human resource needs for main tasks.[5]

The steps for calculating it are as follows.

$$Activity\ time = Average\ time \times unit\ of\ time$$

$$Supporting\ task\ factor = \frac{Activity\ time}{Available\ working\ time} \times 100\%$$

$$Supporting\ task\ standard = \left(\frac{1}{1 - \frac{Supporting\ task\ factor}{100}}\right)$$

Calculating healthcare human resource requirements

The formula for calculating healthcare human resource requirements is as follows.

$$Healthcare\ human\ resource\ requirements = \frac{Achievement\ 1\ year}{Workload\ standard} \times Supporting\ task\ standard$$

The annual output refers to the coverage of main tasks and activities of each healthcare facility over a period of one year.[5]

Based on Table 8, the total requirement for medical record and health information personnel at hospital X is 29 officers, while currently only 20 are available, indicating a shortage of 9 officers. The shortage of 9 personnel is specially in the reporting position, whereas the other positions have been filled.

Table 3: Workload components and time norms.

S. no.	Activities	Time norms	Denomination
1	**Admission**		
	Grooming and identifying patient data	0.54	Minutes/patient
	Checking and input patient data into the registration system	1.30	Minutes/patient
	Printing medical cards and patient labels	0.66	Minutes/patient
2	**Filing and distribution**		
	Registering patient medical records to be searched in the storage rack	0.15	Minutes/file
	Retrieving patient medical records	1.78	Minutes/file
	Sending medical records to the clinic	0.10	Minutes/file
	Returning medical records to the filing room	0.2	Minutes/file
	Storing patient medical records in the rack	0.33	Minutes/file
3	**Emergency department data management**		
	Coding diagnoses and procedures and assembling medical records for emergency department patient	2.5	Minutes/file
	Managing information release and medico-legal documents (insurance administration, visum et repertum, medical resume legalization, and death certificates birth records)	5	Minutes/file
4	Daily inpatient cencus processing		
	Verifying data	5	Minutes/file

Continued.

S. no.	Activities	Time norms	Denomination
	Input data into Microsoft excel	15	Minutes/file
5	**Inpatient data processing**		
	Verifying data and assembling inpatient medical records	2	Minutes/file
	Coding diagnoses and procedures	3	Minutes/file
	Conducting quantitative analysis of medical record completeness	5	Minutes/file
	Preparing daily reports of the most common cases	3	Minutes/file
	Preparing weekly outbreak reports	0.7	Minutes/file
6	**Outpatient case mix**		
	Verification	0.74	Minutes/file
	Abstaction	1.56	Minutes/file
	Grouping	1.58	Minutes/file
	LIP	1.08	Minutes/file
7	**Inpatient case mix**		
	Verification	4.5	Minutes/file
	Abstaction	5.5	Minutes/file
	Grouping	1.33	Minutes/file
	LIP	0.54	Minutes/file
8	**Case mix reporting**		
	Sorting claim documents	300	Minutes/day
	Preparing abstract reports	30.4	Minutes/month
	Creating claim text files	5	Minutes/week
	Preparing real tariff reports with INA-CBG's tariffs	15.88	Minutes/month
	Preparing individual INA-CBG's claim reports	3	Minutes/week
	Preparing analysis reports for problematic outpatient and inpatient claim files	6.63	Minutes/week
	Preparing outpatient and inpatient problematic claim reports	180	Minutes/day
	Confirming revised claim documents	60	Minutes/day
9	**Report processing**		
	Performing coding analysis	60	Minutes/week
	Preparing periodic reports	30	Minutes/week
	Preparing SPB and scheduling reports	30	Minutes/week
	Preparing traffic accident reports	200	Minutes/week
	Preparing KIA, family planning and immunization reports	150	Minutes/week
	Preparing internal management reports	180	Minutes/week
	Preparing PMKP reports	150	Minutes/week
	Preparing outpatient and inpatient morbidity visit reports	150	Minutes/week
	Preparing external hospital reports	300	Minutes/week

Table 4: Workload standard.

S. no.	Activities	Time norm	Denomination	Available working time (minutes/year)	Workload standard
1	**Admission**				
	Grooming and identifying patient data	0.54	Minutes/patient	72.000	133.333.33
	Checking and input patient data into the registration system	1.30	Minutes/patient	72.000	55.384.62
	Printing medical cards and patient labels	0.66	Minutes/patient	72.000	109.090.91
2	**Filing and distribution**				
	Registering patient medical records to be searched in the storage rack	0.15	Minutes/file	72.000	480.000
	Retrieving patient medical records	1.78	Minutes/file	72.000	40.449.44
	Sending medical records to the clinic	0.10	Minutes/file	72.000	720.000
	Returning medical records to the filing room	0.2	Minutes/file	72.000	360.000
	Storing patient medical records in the rack	0.33	Minutes/file	72.000	218.181.82

Continued.

S. no.	Activities	Time norm	Denomination	Available working time (minutes/year)	Workload standard
3	**Emergency department data management**				
	Coding diagnoses and procedures and assembling medical records for emergency department patient	2.5	Minutes/file	72.000	28.800
	Managing information release and medico-legal documents (insurance administration, visum et repertum, medical resume legalization, and death certificates birth records)	5	Minutes/file	72.000	14.400
4	**Daily inpatient cencus processing**				
	Verifying data	5	Minutes/file	72.000	14.400
	Input data into Microsoft excel	15	Minutes/file	72.000	4.800
5	**Inpatient data processing**				
	Verifying data and assembling inpatient medical records	2	Minutes/file	72.000	36.000
	Coding diagnoses and procedures	3	Minutes/file	72.000	24.000
	Conducting quantitative analysis of medical record completeness	5	Minutes/file	72.000	14.400
	Preparing daily reports of the most common cases	3	Minutes/file	72.000	24.000
	Preparing weekly outbreak reports	0.7	Minutes/file	72.000	102.857.14
6	**Outpatient case mix**				
	Verification	0.74	Minutes/file	72.000	97.297.30
	Abstaction	1.56	Minutes/file	72.000	46.153.85
	Grouping	1.58	Minutes/file	72.000	45.569.62
	LIP	1.08	Minutes/file	72.000	66.666.67
7	**Inpatient case mix**				
	Verification	4.5	Minutes/file	72.000	16.000
	Abstaction	5.5	Minutes/file	72.000	13.090.91
	Grouping	1.33	Minutes/file	72.000	54.135.34
	LIP	0.54	Minutes/file	72.000	133.333.33
8	**Case mix reporting**				
	Sorting claim documents	30.4	Minutes/month	72.000	197.37
	Preparing abstract reports	5	Minutes/week	72.000	276.92
	Creating claim text files	15.88	Minutes/month	72.000	377.83
	Preparing real tariff reports with INA-CBG's tariffs	3	Minutes/week	72.000	461.54
	Preparing individual INA-CBG's claim reports	6.63	Minutes/week	72.000	208.84
9	**Report processing**				
	Performing coding analysis	60	Minutes/week	72.000	23.08
	Preparing periodic reports	30	Minutes/week	72.000	46.15
	Preparing SPB and scheduling reports	30	Minutes/week	72.000	46.15
	Preparing traffic accident reports	200	Minutes/week	72.000	6.92
	Preparing KIA, family planning and immunization reports	150	Minutes/week	72.000	7.69
	Preparing internal management reports	180	Minutes/week	72.000	7.69
	Preparing PMKP reports	150	Minutes/week	72.000	9.23
	Preparing outpatient and inpatient morbidity visit reports	150	Minutes/week	72.000	9.23
	Preparing external hospital reports	300	Minutes/week	72.000	4.62

Table 5: Supporting task standard.

S. no.	Activities	Average time	Denominator	Activity time (minutes/year)	Available working time (minutes/year)	Supporting task factor (%)
1	Medical records and health information training	600	Minutes/year	600	72.000	0.83

Continued.

S. no.	Activities	Average time	Denominator	Activity time (minutes/year)	Available working time (minutes/year)	Supporting task factor (%)
2	Basic life support training	120	Minutes/year	120	72.000	0.17
3	Effective communication training	360	Minutes/year	360	72.000	0.50
4	Excellent service training	180	Minutes/year	180	72.000	0.25
Supporting task factor						1.75
Supporting task standard						1.01

Table 6: Requirements for medical record and health information officers.

S. no.	Activities	Achievements (1 year)	Workload standard	Health human resources needs	Total staff needed
1	**Admission**				
	Grooming and identifying patient data	115.541	133.333.33	0.87	4.01
	Checking and input patient data into the registration system	115.541	55.384.62	2.09	
	Printing medical cards and patient labels	115.541	109.090.91	1.06	
2	**Filing and distribution**				
	Registering patient medical records to be searched in the storage rack	115.541	480.000	0.24	4.11
	Retrieving patient medical records	115.541	40.449.44	2.86	
	Sending medical records to the clinic	115.541	720.000	0.16	
	Returning medical records to the filing room	115.541	360.000	0.32	
	Storing patient medical records in the rack	115.541	218.181.82	0.53	
3	**Emergency department data management**				
	Coding diagnoses and procedures and assembling medical records for emergency department patient	16.144	28.800	0.56	0.57
	Managing information release and medico-legal documents (insurance administration, visum et repertum, medical resume legalization, and death certificates birth records)	120	14.400	0.01	
4	**Daily inpatient cencus processing**				
	Verifying data	1.825	14.400	0.13	0.51
	Input data into Microsoft excel	1.825	4.800	0.38	
5	**Inpatient data processing**				
	Verifying data and assembling inpatient medical records	7.704	36.000	0.21	0.57
	Coding diagnoses and procedures	7.704	24.000	0.32	
	Conducting quantitative analysis of medical record completeness	12	14.400	0.001	
	Preparing daily reports of the most common cases	4	24.000	0.0002	
	Preparing weekly outbreak reports	3.120	102.857.14	0.03	
6	**Outpatient case mix**				
	Verification	64.392	97.297.30	0.66	4.44
	Abstaction	64.392	46.153.85	1.40	
	Grouping	64.392	45.569.62	1.41	
	LIP	64.392	66.666.67	0.97	
7	**Inpatient case mix**				
	Verification	5.793	16.000	0.36	0.96
	Abstaction	5.793	13.090.91	0.44	
	Grouping	5.793	54.135.34	0.11	
	LIP	5.793	133.333.33	0.04	

Continued.

S. no.	Activities	Achievements (1 year)	Workload standard	Health human resources needs	Total staff needed
8	**Case mix reporting**				
	Sorting claim documents	12	197.37	0.06	1.38
	Preparing abstract reports	24	276.92	0.09	
	Creating claim text files	12	377.83	0.03	
	Preparing real tariff reports with INA-CBG's tariffs	24	461.54	0.05	
	Preparing individual INA-CBG's claim reports	240	208.84	1.15	
9	**Report processing**				
	Performing coding analysis	24	23.08	1.04	12.13
	Preparing periodic reports	24	46.15	0.52	
	Preparing SPB and scheduling reports	24	46.15	0.52	
	Preparing traffic accident reports	12	6.92	1.73	
	Preparing KIA, family planning and immunization reports	12	7.69	1.56	
	Preparing internal management reports	12	7.69	1.56	
	Preparing PMKP reports	12	9.23	1.30	
	Preparing outpatient and inpatient morbidity visit reports	12	9.23	1.30	
	Preparing external hospital reports	12	4.62	2.60	

Table 7: Calculation of medical records and health information staff needs.

S. no.	Activities	Total staff needed	Supporting task standard	Total medical records and health information staff needed
1	Admission	4.01	1.01	4
2	Filing and distribution	4.11	1.01	4
3	Emergency department data management	0.57	1.01	1
4	Daily inpatient cencus processing	0.18	1.01	1
5	Inpatient data processing	0.57	1.01	1
6	Outpatient case mix	4.44	1.01	4
7	Inpatient case mix	0.96	1.01	1
8	Case mix reporting	1.38	1.01	1
9	Report processing	12.13	1.01	12
Total overall medical records and health information staff needed				29

Table 8: Recapitulation of medical records and health information staff needed.

S. no.	Activities	Available staff	Total staff needed	Gap	Remarks
1	Admission	4	4	0	Adequate
2	Filing and distribution	4	4	0	Adequate
3	Emergency department data management	1	1	0	Adequate
4	Daily inpatient cencus processing	1	1	0	Adequate
5	Inpatient data processing	1	1	0	Adequate
6	Outpatient case mix	4	4	0	Adequate
7	Inpatient case mix	1	1	0	Adequate
8	Case mix reporting	1	1	0	Adequate
9	Report processing	3	12	-9	Insufficient
Total needs		20	29	-9	Insufficient

DISCUSSION

The current number of medical record and health information officers at hospital X is still insufficient. An additional 9 personnel are needed to fulfil the primary duties in the medical records unit.

The registration officers at hospital X are currently in line with the needs. This indicates that the workload is being managed effectively by the staff. Considering the importance of the registration department in every hospital to ensure a smoother healthcare service flow, proper workload distribution in the registration section also helps maintain the efficiency of the initial administrative process for patient and creates a positive first impression for those seeking treatment. This is consistent with the research conducted by Cartmill et al.[6]

The filing and distribution officers at hospital X are currently in line with the needs. This department is responsible for ensuring that patient medical records are ready and available when needed and can be distributed to clinics or wards. With the staffing needs in this department met, the distribution of task will be balanced and there will be no delays in patient services caused by waiting for medical records to be a delivered to clinics or wards. This is also discussed in the research by Fishbein et al.[7]

The data management officers in the emergency department at hospital X are currently in line with the needs. This enables swift administrative handling as the officers' workload is adjusted to the demands of emergency department management, which requires accuracy and speed due to the emergency conditions of some patients. Research conducted by Cartmill et al.[5] Mentioned that the workload can increase along with the rise in emergency cases, thus periodic evaluations are necessary to ensure the workload remains stable.[6]

The inpatient daily census processing officers at hospital X are already in line with the needs. These officers play an important role in monitoring the daily number of inpatients. This also needs to be periodically evaluated to ensure the number of officers remains optimal as the number of inpatients increases.[8]

The inpatient data processing officers at hospital X are already in line with the needs. Inpatient data processing is crucial for hospital management, such as for decision making and evaluating the healthcare services provided to patients.[9] When the officers' workload is appropriate, they can perform their primary tasks more optimally, resulting in high quality reporting.

The outpatient case mix, inpatient case mix and case mix reporting officers at hospital X are already in line with the needs. These officers are responsible for classifying diagnosis and treatment codes, which are then grouped into the system for billing claims. Therefore, accuracy and precision in coding diagnose and treatments are required.[10] With an appropriate workload, the quality and accuracy of the coding will improve, minimizing the chances of claim failures.

Based on the calculation of the reporting officers' needs at hospital X using the healthcare workload analysis method, there is a shortage of 9 officers. This indicates the potential for a very high workload, which could lead to delays or errors in both internal and external hospital reporting.[11] Reporting officers require more staff because the analysis shows that as activities and working hours increase, the workload on the officers becomes heavier, necessitating additional personnel to fulfil their duties. A possible solution is to hire more staff or adopt technology that can automate work processes to ease the officers' workload.[6]

The overall result of this study indicated that most sections within the medical records unit at hospital X have a sufficient number of medical record and health information officers to meet the needs, allowing for effective workload distribution. However, there is a significant shortage of personnel in the reporting section, whit a deficit of 9 officers, which requires immediate attention from hospital management to avoid a decline in the quality of healthcare services.

Limitations

A limitation of study is that each medical records staff at hospital X has varying time norms for each task, leading the researcher to average the time norms across all staff for each activity.

CONCLUSION

The medical records unit at hospital X generally has a sufficient number of staff to meet operational needs, allowing for well-managed workload distribution and smooth service delivery. However, there is a significant staff shortage in the reporting management section, where an additional 9 employees are needed to optimally support administrative and reporting processes. This shortage has the potential to cause delays or errors in report preparation. Therefore, it is recommended that hospital management consider adding staff or adopting technology to help reduce the workload in this section.

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