

Analysis of pharmaceutical technical staff needs at hospital X in Bandung using the WISN method

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ABSTRACT

One of the essential and inseparable health services in hospitals is pharmaceutical services. Pharmaceutical services in hospitals are carried out by the Hospital Pharmacy Installation (*Instalasi Farmasi Rumah Sakit/IFRS*). The implementation of pharmaceutical services in hospitals must be supported by adequate, skilled, and competent human resources so that pharmaceutical service activities can run well and are high quality for patients. The lack of human resources for pharmaceutical services will result in excessive workload and reduced quality of pharmaceutical services. One method widely used to determine the number of staff needs is the Workload Indicators of Staffing Needs (WISN). Analysis of the need for pharmaceutical technical staff at Hospital X in Bandung City was carried out using the WISN method. The data used for the analysis were obtained from interviews, observations, and data collection on pharmaceutical services from the pharmacy installation of the Hospital X. The results of the WISN analysis showed that the need for pharmaceutical technical personnel for central pharmacy installations providing outpatient and inpatient services is 87 people, the total need for the emergency room pharmacy satellite is 6 people, the operating room pharmacy satellite is 6 people, and the pharmacy warehouse is 3 people. From the results of WISN ratio, the number of pharmaceutical technical staff available for the central pharmacy installation, emergency room pharmacy satellite, and operating room pharmacy satellite are still inadequate for the existing workload (WISN ratio < 1). In contrast, for the pharmaceutical warehouse, it is adequate (WISN ratio = 1). Therefore, Hospital X needs to consider adding existing pharmaceutical technical staff to support more optimal pharmaceutical services at the hospital.

Keywords: pharmaceutical technical staff, pharmaceutical installation, pharmaceutical services, workload, WISN

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INTRODUCTION

A hospital is a health service facility that provides comprehensive individual health services through promotive, preventive, curative, rehabilitative, and palliative health services by providing inpatient, outpatient, and emergency services (Pemerintah Republik Indonesia, 2023). One of the important health services in hospitals is pharmaceutical services. According to Minister of Health Regulation (*Peraturan Menteri Kesehatan*) Number 72 of 2016 concerning Pharmaceutical Service Standards in Hospitals, pharmaceutical services are a direct and responsible service to patients related to pharmaceutical preparations to achieve definite results and improve the patient's quality of life. Pharmaceutical services in hospitals are carried out by the Hospital Pharmacy Installation or *Instalasi Farmasi Rumah Sakit* (IFRS) (Kementerian Kesehatan RI, 2016). Hospital Pharmacy Installation is an installation in a hospital led by a pharmacist and assisted by other pharmaceutical staff to provide pharmaceutical services, including management of pharmaceutical supplies and clinical pharmacy services (Agustini et al., 2023; Siregar, 2004).

The implementation of pharmaceutical services in hospitals must be supported by adequate, skilled, and competent human resources (HR) so that pharmaceutical service activities can run well and are of high quality for patients. Human resources for pharmaceutical services are known as pharmaceutical personnel, which can consist of pharmacists and pharmaceutical technical staff. Pharmaceutical Technical Staff or *Tenaga Teknis Kefarmasian* (TTK) are personnel who assist pharmacists in carrying out pharmaceutical work. Pharmaceutical technical staff can consist of undergraduate pharmacists, intermediate pharmacy experts, and pharmaceutical analysts. The availability of the number of pharmaceutical technical staff in hospital pharmaceutical installations must be fulfilled following the hospital classification and licensing provisions determined by the Minister of Health to achieve the targets and objectives of the pharmaceutical installation (Govule et al., 2015; Kuswandani et al., 2021). The lack of human resources for pharmaceutical services will result in excessive workload and reduced quality of pharmaceutical services. The decline in the quality of standard pharmaceutical services is characterized by the failure to achieve minimum service standard indicators in health facilities (Gialama et al., 2019; Rensiner et al., 2018; Yulaika, 2018). Decreased service quality can have an impact on increasing service waiting times, decreasing patient satisfaction, and increasing the occurrence of medication errors (Govule et al., 2015; Kuswandani et al., 2021). Therefore, hospitals need to consider and plan the availability of pharmaceutical technical staff based on the function and workload of each pharmaceutical service unit (Akbar et al., 2020).

Currently, there are several methods for calculating the number of health workers needed so that the workload is not excessive. The Indonesian Ministry of Health recommends three methods, namely the ratio of health workers per population, the standard number of health workers based on health facilities, and the WISN method developed by the World Health Organization (WHO) (Kementerian Kesehatan RI, 2016; WHO, 2023). The WISN method will help to calculate the estimated number of workers/health workers needed based on workload or activity standard. The WISN method is an effective way to accurately determine the necessary number of pharmaceutical technical staff in each work unit (Wahyu Ningsih et al., 2020). The WISN method has several advantages, including being easy to use, fast, being able to carry out calculations more accurately based on workload, and being comprehensive (Cucu et al., 2019; Kuswandani et al., 2021).

Hospital X in Bandung is a general hospital classified as class B which has 300 beds, 10 installations of medical services, 5 installations of non-medical services, and 1 unit of non-medical service. One of the medical service installations in Hospital X is a pharmacy installation. The pharmacy installation at Hospital X includes the central pharmacy installation, which provides pharmaceutical services for inpatient and outpatient care, emergency room pharmacy satellite, operating room pharmacy satellite, and pharmacy warehouse. The pharmacy installation in Hospital X provides 24-hour services, except pharmacy warehouse. The pharmacy installation at Hospital X has 9 pharmacists and 40 pharmaceutical technical staff. Health services and the number of prescriptions continue to increase every day, causing the workload in pharmaceutical installations to increase. Therefore, this research aims to analyze the

number of pharmaceutical technical personnel needed based on the existing workload using the WISN method.

MATERIALS AND METHOD

Materials

The data required to calculate the number of pharmaceutical technical staff required consists of the number of working days in a year: the number of holidays and national leave in a year; the number of days of leave or permission due to illness, training, or other reasons; type of pharmaceutical service activities at Hospital X; the number of prescription services and other services in a year; as well as currently available total of staff.

Methods

Data collection

This is descriptive research to determine the number of pharmaceutical technical staff needed based on the existing workload in pharmacy installation at Hospital X to improve pharmaceutical services at Hospital X. Data collection was carried out by observation, interviews with pharmaceutical technical staff, as well as data from pharmaceutical services at Hospital X in the period on September 2022 – August 2023. The types of pharmaceutical work carried out by pharmaceutical staff and how long it takes to do each job were obtained through observation. Details of the pharmaceutical work observed refer to Minister of Health Regulation 72/2016 concerning Pharmaceutical Service Standards in Hospitals. There are three ways to calculate the workload of pharmaceutical technical staff, that are work sampling, time and motion study, and daily log (Lubis et al., 2022). The frequency of carrying out pharmaceutical work and estimates of the time required were also obtained through interviews with pharmaceutical staff. Interview were carried out using random sampling by asking questions related to the pharmaceutical work being carried out and the estimated time required.

Workload indicator of staffing needs method

Determination of Available Working Time (AWT)

Available Working Time (AWT) is the time available for pharmaceutical technical staff to work within one year. AWT can be determined from working days in a year minus annual leave days, national holidays, and leave/permission days due to illness or training activities. Available working time can be determined using the following formula (WHO, 2023).

$$AWT = A - (B + C + D + E)$$

In this formula AWT is the total available working time; A is the number of possible working days in a year; B is the number of days off for public holidays in a year; C is the number of days off for annual leave in a year; D is the number of days off due to sick leave in a year; E is the number of days off due to other leave, such as training, etc., in a year. The AWT results are then multiplied by the working hours in one day to get the available working time in hours.

Determination of workload component

The workload components of pharmaceutical technical staff were determined based on interviews and observations of the work activities of pharmaceutical technical personnel in the pharmaceutical installations center, emergency room pharmacy satellite, operating room pharmacy satellite, and pharmacy warehouses (WHO, 2023).

Determination of activity standard

Activity standard is the time required by pharmaceutical technical staff to complete an activity that is a workload component by standards. Activity standard data was obtained through data from Hospital X pharmacy installation, observations, interviews, and calculations (WHO, 2023).

Determination of standard workload

Standard workload is the amount of work in a health service workload component that can be carried out by a health worker in a year. Standard workload calculations can be done by assuming that a health worker carries out all components of the workload in one year (Aulia et al., 2019). Standard workload calculations can be done using the mention equation 1 (WHO, 2023).

$$\text{Standard workload} = \frac{\text{Available working time}}{\text{Average working time}} \dots\dots\dots(1)$$

Calculating the number of pharmaceutical technical staff based on standard health service workload can be done using the following equation.

$$\text{Number of staff needs for health care activities (A)} = \frac{\text{Quantity of activities}}{\text{Standard workload}} \dots\dots\dots(2)$$

Calculating the number of pharmaceutical technical staff based on supporting activities workload can be done using the following equation 3.

$$\text{Number of staff needs for supporting activities (B)} = \frac{1}{1 - \text{total of supporting activities}} \dots\dots\dots(3)$$

Calculating the number of pharmaceutical technical staff based on individual additional activities workload can be done using the following equation 4.

$$\text{Number of staff needs for individual activities (C)} = \frac{\text{Total of individual additional activities}}{\text{Available working time}} \dots\dots\dots(4)$$

Determination of total of pharmaceutical technical staff needs

The number of pharmaceutical technical staff needed can be calculated from data calculated from the number of staff needed for health services, supporting activity, and additional activity (WHO, 2023). Calculations can be done using the following equation 5.

$$\text{Total of pharmaceutical technical staff needs} = A \times B + C \dots\dots\dots(5)$$

Determination of WISN ratio

The results of calculating the need for pharmaceutical technical staff using the WISN method are expressed in the WISN ratio. The WISN ratio can see whether the existing number of pharmaceutical technical staff is following the existing workload or is insufficient so that the workload of each pharmaceutical technical staff is exceeded (WHO, 2023). The WISN ratio can be determined using the following equation 6.

$$\text{WISN Ratio} = \frac{\text{Total of current pharmaceutical technical staff}}{\text{Total value of calculation pharmaceutical technical staff}} \dots\dots\dots(6)$$

Data Analysis

The data that has been collected is processed using Microsoft Excel to carry out WISN method calculations. The data that has been processed will be presented in tabular form and interpreted according to the results of the WISN method established by WHO.

RESULT AND DISCUSSION

Since becoming a Regional General Hospital, Hospital X had an increase in visits and the number of health services, including pharmaceutical services. The higher the level of health services in the hospital, the more prescriptions or requests for pharmaceutical supplies must be provided by pharmaceutical staff. This can cause an increase in workload if not accompanied by the addition of the appropriate number of human resources. One method that is easy and comprehensive to use in determining the number of pharmaceutical technical staff needs is the Workload Indicator Staffing Needs (WISN) method. The WISN method can help hospital management determine the appropriate number of health workers, such as doctors, pharmaceutical staff, nurses, and others, to aid in developing health services in hospitals (Jing et al., 2022). Through the WISN method, it can be seen the difference between the number of pharmaceutical technical staff available and the number of pharmaceutical technical staff needed based on the workload carried out (Doosty et al., 2019; McQuide et al., 2013). WISN method is a method that is widely used because it is easy to do using available data, easy to use for all health staff, and realistic for providing human resource allocation (WHO, 2023).

The initial step in the WISN method is to determine available working time (AWT). Pharmaceutical technical staff do not work every day for one year. There are several days and times when staff do not do work. Therefore, it is necessary to determine available working time which shows the staff time available in one year to do their work at the hospital. Available working time can be expressed in days per year, hours per year, or minutes per year (Sungkonoputri & Dhamanti, 2023; WHO, 2023). Based on the results of the study, pharmaceutical technical staff at Hospital X worked for 6 days in 1 week and every working day worked for 6.5 hours. Available working time for pharmaceutical technical staff in a year is 1748.5 hours/year or equivalent to 104,910 minutes/year. Available working time was obtained from the results of working days in one year minus the number of annual leave days, national holidays, and the average day of leave due to illness or training. Data and results of Available working time can be seen in Table 1.

Table 1. Available working time of pharmaceutical technical staff in Hospital X

Factor	Total	Annotation
Number of working days (A)	312	days/year
National holiday leave (B)	15	days/year
Mass leave (C)	8	days/year
Annual leave (D)	12	days/year
Leave due to illness / training / other reasons (E)	8	days/year
Daily working hours (F)	6.5	hours/day
Available working time (AWT)	269	day/year
AWT = [A – (B+C+D+E)] x F	1748.5	hour/year
	104,910	minute/year

In deciding the number of pharmaceutical technical staff needed, it is necessary to group the available workload components. Based on WHO, workload components can be grouped into three, (a) health service activities refer to pharmaceutical services (especially direct pharmaceutical services to patients) carried out by pharmaceutical technical staff; (b) supporting activities, refer to important work that can support health service activities and is carried out by all pharmaceutical technical personnel; (c) individual additional activities, refer to specific responsibilities and tasks assigned to only a few pharmaceutical technical staff. Adding a list of workload components that are rarely worked on or

require little work time makes an insignificant difference in the final calculation results. Although detailing workload components can improve calculation accuracy, it also increases the burden and costs, time, and effort in WISN calculations (Gialama et al., 2019; WHO, 2023). The next step in the WISN method after determining available working time and workload components is determining activity standards. Activity standards are the time required by trained pharmaceutical technical staff to perform pharmaceutical services according to professional standards. Activity standards are divided into service standards for health care activities and allowance standard for supporting and additional activities for health care. Supporting activities are carried out by all pharmaceutical technical staff, while additional activities are only carried out by a few assigned staff (WHO, 2023).

Determination of the number of pharmaceutical technical staff needs is carried out for each functional unit of pharmaceutical services, namely the central pharmacy installation, emergency room pharmacy satellite, operating room pharmacy satellite, and pharmacy warehouse. The central pharmaceutical installation is a pharmaceutical installation at the hospital X which serves the need for pharmaceutical supplies for inpatient and outpatient care. From September 2022 to August 2023, the number of prescriptions served outpatient and inpatient at Hospital X amounted to 39,537 prescriptions and 220,331 prescriptions respectively. The number of prescription services continues to increase causing the workload to increase. The results of calculating the need for pharmaceutical technical staff based on the workload showed in the Table 2, the pharmaceutical technical staff needed in the central pharmacy installation is around 87 people. However, currently there are 27 pharmaceutical technical staff available at the central pharmacy installation.

The WISN results can be analyzed in two ways, including (1) by looking at the difference between the number of existing staff and the number of staff needed or (2) calculating the ratio of the difference in the number of staff. If the WISN ratio result is equal to 1, this shows that the current number of staff is balanced with staff needs so that the workload is also balanced. If the WISN ratio result is less than one, then the number of staff currently available is not sufficient for the existing workload. If the WISN ratio result is more than 1, it shows that the number of existing staff exceeds the workload that must be done (overstaffing) (Agustini et al., 2023; WHO, 2023). The WISN ratio of the difference in the number of available pharmaceutical technical personnel in central pharmacy installation and the total calculation results is 0,31. Based on WHO provisions, the available number of health workers is inadequate for the existing workload, causing every pharmaceutical technical staff at Hospital X to have an excessive workload (Gialama et al., 2019; WHO, 2023).

The pharmacy installation at Hospital X has two satellites that assist pharmaceutical services at the hospital. The two satellites are the emergency room pharmacy satellite and the operating room pharmacy satellite. The emergency room pharmacy satellite performs pharmaceutical service activities in the emergency room. Currently, the emergency room pharmacy satellite is run by 4 pharmaceutical technical staff. Each work shift is filled by 1 pharmaceutical technical staff. However, an analysis of the need for pharmaceutical technical staff based on workload in Table 3, shows that around 6 people are needed to carry out pharmaceutical services in the emergency room pharmacy satellite. The result of the WISN ratio for emergency room pharmacy satellites is 0.66, which means that the number of staff available is not commensurate with the workload that must be carried out.

The operating room pharmacy satellite at Hospital X aims to provide pharmaceutical services in the central surgical installation. The operating room pharmacy satellite is currently also run by 4 pharmaceutical technical staff with one work shift filled by one staff. Based on the results of the analysis using the WISN method in Table 4, the number of pharmaceutical technical staff required to carry out pharmaceutical services based on the workload in the operating room satellite pharmacy is 6 people. The number of staff available is still inadequate for the existing workload, as indicated by a WISN ratio value of less than 1 (WISN ratio 0.66) (Purwanti & Syam, 2024; WHO, 2023).

Table 2. The result of pharmaceutical technical staff needs analysis in Hospital X central pharmacy installation by WISN method

Healthcare Activities	Activity Standard (min/activities)	Standard Workload (min)	Number of Staff Needs	
Acceptance, assessment, and input of outpatient prescription	3	34970	1.13	
Preparation, checking, and etiquette labeling of outpatient prescription	17	6171	6.41	
Distribution of outpatient drugs to patients	5	20982	1.88	
Acceptance, assessment, and input of inpatient prescription	3	34970	6.30	
Preparation, checking, and etiquette labeling of inpatient prescription	15	6994	31.50	
Inpatient concoction drug services	20	5246	2.20	
Distribution of pharmaceutical supplies to the nurse	10	10491	21	
Medication concocting	20	5246	0.41	
Dispensing of sterile preparations and/or total parenteral nutrition (TPN)	30	3497	0.45	
Total of pharmaceutical technical staff needs for health services			71.29	
Supporting Activities	Activity standard (min)	Activity Category	Total of Activity standard (min)	Number of Staff Needs
Shift change	10	Daily	30	0.077
Shift report	10	Daily	30	0.077
Pharmaceutical supply stock checking	60	Monthly	60	0.007
Stok opname (SO)	390	Annual	780	0.007
Total of supporting activities			0.17	
Total of pharmaceutical technical staff needs for supporting activities			1,20	
Additional Activities	Activity standard (min)	Number of Activities	Frequency (per year)	Number of Staff Needs
Narcotics and psychotropic stock cheking	10	2	807	269
Return of medication from the inpatient room	15	1	2421	605.25
Room and refrigerator temperature report	3	1	538	26.9
Input requests pharmaceutical supply needs to pharmaceutical warehouses	10	1	156	26
Receipt and check of pharmaceutical supplies from pharmaceutical warehouses	30	1	156	78
Storage of pharmaceutical supplies from warehouses and stock card updates	60	3	156	468
Emergency trolley checking	30	1	2	1
Total of additional activities			1474.15	
Total of pharmaceutical technical staff needs for additional activities			0.84	
Total of pharmaceutical technical staff needs for central pharmacy installation (people)			86.55	

Table 3. The result of pharmaceutical technical staff needs analysis in Hospital X emergency room pharmacy satellite by WISN method

Healthcare Activities	Activity standard (min/activities)	Standard Workload (min)	Number of Staff Needs	
Acceptance, assessment, and input of discharge patient prescription from the ER	3	34970	0.02	
Preparation, checking, and etiquette labeling of discharge patient prescription from the ER	17	6171	0.11	
Distribution of outpatient drugs to patients	5	20982	0.03	
Acceptance, assessment, and input of pharmaceutical supply for ER	3	34970	1.23	
Preparation of demand for pharmaceutical supply from ER	5	20982	2.04	
Distribution of pharmaceutical supplies to the ER nurse	3	34970	1.23	
Total of pharmaceutical technical staff needs for health services			4.66	
Supporting Activities	Activity standard (min)	Activity Category	Total of Activity standard	Number of Staff Needs
Shift change	10	Daily	30	0.077
Shift report	10	Daily	30	0.077
Pharmaceutical supply stock checking	60	Monthly	60	0.007
Stok opname (SO)	390	Annual	780	0.007
Total of supporting activities				0.17
Total of pharmaceutical technical staff needs for supporting activities				1.20
Additional Activities	Activity standard (min)	Number of Activities	Frequency (per year)	Number of Staff Needs
Reports of narcotics and psychotropic use in the ER	10	1	269	44.83
Room and refrigerator temperature report	5	1	807	67.25
Preparation of birth packages (partus set)	5	1	1345	112.08
Input requests pharmaceutical supply needs to pharmaceutical warehouses	3	1	156	7.8
Receipt and check of pharmaceutical supplies from pharmaceutical warehouses	15	1	156	39
Storage of pharmaceutical supplies from warehouses and stock card updates	30	1	156	78
Emergency trolley checking	30	1	2	1
Total of additional activities				349.97
Total of pharmaceutical technical staff needs for additional activities				0.20
Total of pharmaceutical technical staff needs for ER pharmacy satellite (people)				5.81

Table 4. The result of pharmaceutical technical staff needs analysis in Hospital X operating room pharmacy satellite by WISN method

Healthcare Activities	Activity standard (min/activities)	Standard Workload (min)	Number of Staff Needs	
Preparation of surgical packages and pharmaceutical supplies requirements	30	3497	3.29	
Carry out input and return of pharmaceutical supplies used for operations	15	6994	1.64	
Total of pharmaceutical technical staff needs for health services			4.93	
Supporting Activities	Activity standard (min)	Activity Category	Total of Activity standard	Number of Staff Needs
Shift change	10	Daily	30	0.077
Shift report	10	Daily	30	0.077
Pharmaceutical supply stock checking	60	Monthly	60	0.007
Stok opname (SO)	390	Annual	780	0.007
Total of supporting activities				0.17
Total of pharmaceutical technical staff needs for supporting activities				1.20
Additional Activities	Activity standard (min)	Number of Activities	Frequency (per year)	Number of Staff Needs (people)
Reports of narcotics and psychotropic use in the OR	10	1	269	44.83
Room and refrigerator temperature report	5	1	807	67.25
Preparation of birth packages (partus set)	3	1	156	7.8
Input requests pharmaceutical supply needs to pharmaceutical warehouses	15	1	156	39
Receipt and check of pharmaceutical supplies from pharmaceutical warehouses	30	1	156	78
Storage of pharmaceutical supplies from warehouses and stock card updates	30	1	2	1
Total of additional activities				237.88
Total of pharmaceutical technical staff needs for additional activities				0.14
Total of pharmaceutical technical staff needs for OR pharmacy satellite (people)				6.06

The pharmacy warehouse has the main responsibility for managing pharmaceutical supplies at Hospital X. The pharmacy warehouse plays a role in planning, procurement, storage, distribution, and administration related to the management of pharmaceutical supplies. Based on the results of the WISN analysis, the pharmaceutical warehouse requires 3 pharmaceutical technical personnel as shown in [Table 5](#). Currently, the pharmaceutical warehouse at Hospital X has 3 pharmaceutical technical staff. The WISN ratio is 1 and shows that the current workforce is balanced or adequate for the existing workload ([Purwanti & Syam, 2024](#); [WHO, 2023](#)).

Table 5. The result of pharmaceutical technical staff needs analysis in Hospital X pharmacy warehouse by WISN method

Healthcare Activities	Activity standard (min/activities)	Standard Workload (min)	Number of Staff Needs	
Acceptance of pharmaceutical supply requests from the central pharmacy installation	10	10491	0.01	
Process of mutation/input of pharmaceutical supply in the SIMRS system	60	1749	0.09	
Preparation of pharmaceutical supplies according to central pharmacy installation request	180	583	0.27	
Distribution of pharmaceutical supplies to central pharmacy installation	30	3497	0.04	
Double check of pharmaceutical supply in central pharmacy installation	120	874	0.18	
Acceptance of pharmaceutical supply requests from pharmacy satellites	10	10491	0.03	
Process of mutation/input of pharmaceutical supply in the SIMRS system	30	3497	0.09	
Preparation of pharmaceutical supplies according to pharmacy satellite request	90	1166	0.27	
Distribution of pharmaceutical supplies to pharmacy satellites	30	3497	0.09	
Double check of pharmaceutical supply in pharmacy satellites	60	1749	0.18	
Acceptance of pharmaceutical supply requests from inpatient room	15	6994	0.10	
Preparation of pharmaceutical supplies according to inpatient room request	30	3497	0.21	
Total of pharmaceutical technical staff needs for health services			1.56	
Supporting Activities	Activity standard (min)	Activity Category	Total of Activity standard	Number of Staff Needs
Storage and updating of incoming drug stock cards	160	Daily	160	0.410
Storage and updating of stock cards for medical equipment/consumable medical materials	160	Daily	160	0.410
Enter drug invoices	60	Daily	60	0.154
Enter invoices for medical equipment/consumable medical materials	60	Daily	60	0.154
Coordinate the management of pharmaceutical supplies, medical devices and consumable medical materials	60	Weekly	120	0.059
Storage of invoice documents / drug order letters	30	Weekly	30	0.015
Storage of invoice documents/orders letters for	30	Weekly	30	0.015

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medical devices and consumable medical materials				
Storage of invoices for requests for pharmaceutical supplies from the inpatient room	30	Weekly	30	0.015
Storage of report documents	30	Weekly	30	0.015
Check stock of generic drugs	60	Monthly	60	0.007
Check stock of non-generic drugs	60	Monthly	60	0.007
Check stock of medical devices	60	Monthly	60	0.007
Check stock of consumable medical materials	60	Monthly	60	0.007
Total of supporting activities				0.03
Total of pharmaceutical technical staff needs for supporting activities				1.03
Additional Activities	Activity standard (min)	Number of Activities	Frequency (per year)	Number of Staff Needs
Receipt and inspection of invoices with physical form of pharmaceutical inventory	5	2	4304	717.33
Receipt and inspection of invoices with physical form of medical devices / consumable medical materials	5	2	4304	717.33
Monitoring and reporting temperature	5	1	538	44.83
Make plans for the need for pharmaceutical supplies, medical devices, consumable medical materials, and drugs for the health program	240	2	52	416
Make orders for the need for pharmaceutical supplies, medical devices, consumable medical materials, and drugs for the health program	30	1	208	104
Evaluate offers of pharmaceutical supplies	60	2	12	24
Making expired pharmaceutical supply reports	60	1	12	12
Making vaccine reports to the Public Health Office (<i>Dinas Kesehatan</i>)	60	1	12	12
Making an IUD report	60	1	12	12
Making activity reports in the pharmacy warehouse	60	1	12	12
Making reports for product recalls	30	1	12	6
Creation of empty pharmaceutical supply reports	60	1	12	12
Creation of new item reports	60	1	12	12
Total of additional activities				2101.5
Total of pharmaceutical technical staff needs for additional activities				1.20
Total of pharmaceutical technical staff needs for pharmacy warehouse (people)				2.80

CONCLUSION

Based on WISN calculations, the required number of pharmaceutical technical personnel in the central pharmacy installation is 87 people, the emergency room pharmacy satellite is 6 people, the operating room pharmacy satellite is 6 people, and the pharmacy warehouse is 3 people. The analysis result shows the number of pharmaceutical technical staff needed at Hospital X using the WISN method, the current number of pharmaceutical technical personnel in the central pharmacy installation, emergency room pharmacy satellite, and operating room pharmacy satellite are still not following with the existing workload (WISN ratio value < 1). Meanwhile, the pharmaceutical warehouse currently has pharmaceutical technical staff that is appropriate to the existing workload (WISN ratio value = 1). Therefore, Hospital X can consider increasing the number of pharmaceutical technical personnel to improve the existing pharmaceutical services at Hospital X so that patient satisfaction and patient treatment can be achieved more optimally. Hospital X also can improve their human resource management so that the currently available pharmaceutical staff do not experience excessive workload which results in worsening service.

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