



## Using the Workload Indicators of Staffing Need (WISN) Method for Predicting Pharmacists Human Resources in Hospitals

Putranto Manalu<sup>1</sup>; Mita Sahara<sup>2</sup>; Tan Suyono<sup>3\*</sup>; Milka Rositi Sianipar<sup>4</sup>

<sup>1</sup> Faculty of Public Health, Universitas Prima Indonesia

<sup>2,3\*)</sup> Faculty of Medicine, Universitas Prima Indonesia

<sup>4</sup> The Graduate School of Universitas Prima Indonesia

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### ABSTRACT

Pharmacy installation is one of the work units that has a high workload in the hospital. It is critical to measure the number of pharmacists needed to avoid inappropriate workloads and ultimately impact on work stress and impact on patient safety. This study analyzes the demand for energy in pharmaceutical installations using the WISN method. This research is a qualitative descriptive study. Collecting data through observation, interviews, and document review. The results of calculations using the WISN method show a ratio of 0.7 and it can be concluded that the current number of pharmacists is still lacking. The current number of human resources in the pharmacy installation is 29 people. The total need for pharmaceutical personnel according to the WISN formula is 41 people, so that the shortage of pharmaceutical personnel is 11 people. It is recommended for hospital management to determine the duties and functions in accordance with the SOP because there are several nonproductive activities performed by officers at the pharmacy installation. Meeting the number of HR shortages through recruitment can be a way to reduce the workload of pharmaceutical workers. Giving appreciation and additional incentives to be considered by the hospital management, given the increased workload.

#### Kata kunci:

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#### \*) corresponding author

Faculty of Public Health, Universitas Prima Indonesia

Faculty of Medicine, Universitas Prima Indonesia

The Graduate School of Universitas Prima Indonesia

Email: tansuyono@unprimdn.ac.id

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### ABSTRAK

Instalasi farmasi merupakan salah satu unit kerja yang memiliki beban kerja cukup tinggi di rumah sakit. Pengukuran jumlah kebutuhan tenaga farmasi sangat penting untuk dilakukan agar tidak terjadi beban kerja yang tidak sesuai dan pada akhirnya berdampak terhadap stress kerja ser-ta berdampak kepada keselamatan pasien. Penelitian ini bertujuan untuk menganalisis kebutuhan tenaga di instalasi farmasi dengan menggunakan metode WISN. Penelitian ini merupakan penelitian deskriptif kualitatif. Pengumpulan data melalui observasi, wawancara, dan telaah dokumen. Hasil perhitungan dengan metode WISN menunjukkan rasio sebesar 0,7 dan dapat disimpulkan jumlah tenaga farmasi saat ini masih kurang. Jumlah SDM yang ada di instalasi farmasi saat ini adalah 29 orang. Total kebutuhan tenaga kefarmasian menurut rumus WISN adalah sebanyak 41 orang, sehingga kekurangan jumlah tenaga kefarmasian adalah 11 orang. Disarankan bagi pihak manajemen rumah sakit untuk menentukan tugas dan fungsi sesuai dengan SOP karena adanya beberapa kegiatan non produktif yang dilakukan oleh petugas di instalasi farmasi. Pemenuhan jumlah kekurangan SDM melalui perekrutan dapat menjadi keluar untuk pengurangan beban kerja tenaga kefarmasian. Pemberian apresiasi dan penambahan insentif mungkin dapat dipertimbangkan oleh pihak manajemen rumah sakit, mengingat beban kerja yang semakin meningkat.

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## INTRODUCTION

Efforts to implement maximum service quality require competent health workers. Therefore, the preparation of human resources is crucial to note because of its role as a driving force for hospital services that can have a significant influence on the success of achieving hospital goals (Gile et al., 2018). But keep in mind that every health worker has experienced a workload that is too heavy at one time, so that if the workload is not reduced, the potential for work errors will be higher (Weigl et al., 2016).

Workload can be defined as the amount of work a person has or does during a certain period (Kolus et al., 2018). In the SOP, the workload and jobdesk are stated so that the work of health workers is according to their respective portions. If the work given is not in accordance with SOPs and is excessive or work overload, of course, it can lead to decreased service performance (Weigl et al., 2016). Workloads that are too high can also have a negative impact on the physical and psychological health of health workers. Psychological impacts such as work stress, emotional reactions, reactions to psychological pressure, to depression in health workers (Lindwall et al., 2014). Physical impacts such as fatigue, headaches, and indigestion have the potential to endanger workers and patients being served. Medication errors can lead to unwanted treatment outcomes or death. There are two main types of medication errors, including dispensing errors and prescribing errors, accounting for 4% and 70% of medication errors, respectively (Lisby et al., 2005; Velo & Minuz, 2009; Makary & Daniel, 2016).

The role of pharmacists in ensuring the right use of drugs, providing consultation to patients, and being responsible for treatment outcomes makes this profession one of the most important in health care institutions. However, the increase in the use of prescription drugs impacts the workload of pharmacists (Shao et al., 2020). The results of the review of Lea et al. (2012) of several studies related to the workload of pharmacists concluded that their workload is high and has implications for job stress and decreased job satisfaction. Most of the working time of pharmacists is dispensing drugs. The study findings by Chui et al. (2014) showed that external task demands had an indirect effect on consulting performance with patients, and higher levels of fatigue.

In Indonesia, hospital pharmacy installation as a place of practice for pharmacists in hospitals is the unit responsible for the implementation of all pharmaceutical work activities, including the management of pharmaceutical supplies starting from the selection, planning, procurement, storage, preparation, compounding, and direct service to patients (Kementerian Kesehatan, 2016). Some efforts that can be made by the hospital in managing workloads can be done by observing the needs of the workforce by calculating the amount of workload, conducting recruitment according to the field of expertise, placing employees according to their respective competencies and expertise. In addition to job placement and recruitment of health workers, the hospital can implement a clear work system, avoid giving jobs that exceed the employee's ability, focus employees on one task at a time, provide rest periods and work shifts, and provide assistance to areas that are felt crowded positions of service (Fried et al., 2015).

Royal Prima Medan Hospital Pharmacy Installation has 30 pharmacists consisting of 1 head of pharmacy, 3 assistant pharmacists, and 25 pharmaceutical technical personnel whose work schedule is divided into 3 shifts. Researchers

conducted direct observations and interviews with the head of the pharmacy installation and several staff found problems, namely the officers felt the workload was too heavy because of the lack of manpower. From the results of document searches, it was found that there was a discrepancy between the number of pharmacists and the number of patients with a maximum ratio of 1:83 in January 2020 and a ratio of 1:89 in September 2020. The ideal ratio set by the government is 1:50, meaning that 1 pharmacist treats 50 patients daily for outpatient pharmacy services. This situation has an impact on the long waiting time for drugs, causing some patients to be dissatisfied and finally submit a complaint to the hospital's public relations department. One of the important efforts that must be made by the hospital is to plan HR needs appropriately in accordance with the workload and other supporting officers in order to achieve the target.

McQuide et al. (2013) suggested that the Workload Indicators of Staffing Need (WISN) method can be used in assessing the needs of all categories of personnel, both medical and nonmedical. With the workload analysis, the distribution and recruitment of new staff become easier and more rational. Planning the need for pharmacy staff at the Royal Prima Medan Hospital when viewed from the flow of the policy process has not been well structured. The management of human resources, especially the planning for the needs of pharmaceutical workers, has only used job description analysis based on the time set in one day. In actual conditions, pharmacists do not only perform service activities but also perform other activities. This is what underlies the researcher to analyze the workload and determine the number of pharmaceutical workers needed based on real workload using the WISN method and the results obtained will be used for reference data and recommendations for hospitals in managing human resources and solving problems related to workload.

## METHOD

### Research design

This research is a qualitative descriptive study by conducting direct observations with the time motion study method on all employees at the Pharmacy Installation of the Royal Prima Medan Hospital, amounting to 29 people to determine the workload.

### Data collection

In-depth interviews were conducted with 3 informants (IF), namely, the head of the pharmacy installation, 1 pharmacist, and 1 pharmacist assistant. Determination of informants is based on the consideration of the difference in responsibilities (job description) of the three informants. Interview guidelines were prepared to obtain data on available working time, slack standards, workload standards, and perceptions of the number of pharmacists in pharmacy installations. Triangulation is done by conducting interviews with the head of the personnel department and the head of the medical support section. The code for triangulated informants is IT. The researcher also conducted a document review.

**Data analysis**

Measurement of work time and work activities using the form of observation time and motion study. The data obtained were then analyzed using the WISN method with the following steps: 1) observing available working time, 2) determining work units and staff requirements categories, 3) compiling workload standards, 4) compiling slack standards and 5) calculating staff. The results of the calculation of the energy requirements using the WISN method are compared with the available power so that the WISN ratio is obtained (Shipp, 1998). Furthermore, the researcher asked questions directly to the informants with the help of in-depth interview guidelines, and the answers were recorded using a recording device for qualitative analysis. The results of the interviews were then analyzed in several stages, namely reduction, categorization, verification and drawing conclusions. This research has obtained ethical approval from the Health Research Ethics Committee of Universitas Prima Indonesia.

**RESULTS AND DISCUSSION**

This research was conducted during November 2020 to January 2021, which was located at the Pharmacy Installation of the Royal Prima Medan Hospital. The analysis in this study was performed in several stages, namely analyzing the results of direct observations with the time motion study method on all officers at the pharmacy installation, performing calculations using the WISN method and analyzing the results of interviews with informants. At the research location, the researchers found that the excessive workload on the pharmaceutical staff was more because the ratio of the number of human resources was not

ideal. If referring to the Regulation of the Minister of Health No. 58 of 2014 concerning Pharmaceutical Service Standards. There were 3 officers involved in in-depth interviews. The characteristics of the informants indicate the level of productive age with different educational backgrounds, namely 2 people or (66.6%) having an undergraduate education and 1 person or (33.3%) having a diploma education. Informants have an average tenure of > 5 years 1 person or (66.6%) and < 5 years or 1 person (33.3%). The employee status of the informant is 3 permanent employees or (100%).

Next, we conducted an analysis using the time and motion study technique. The technique of calculating workloads using time and motion studies pay attention to what activities are conducted by the research sample (van den Oetelaar et al., 2016). Pharmaceutical activities are divided into four activities consisting of direct pharmaceutical activities, indirect activities, personal and nonproductive activities. The results of the observation show that the pharmacy unit activities that are mostly performed for 7 days are productive activities of 3450 minutes, the second activity is conducted with a nonproductive value of 2060 minutes, while the least productive activities are conducted on personal activities with a total of 928 minutes. It can be concluded that the workload felt by the pharmacy department is large.

The next analysis is to determine the available working time, which is the time that be fulfilled by pharmacists in performing their main activities. Determination of available working time obtains available working time for pharmacy units, especially for a period of one year. The data needed to determine available working time are available working time consisting of activities per day per minute with time allocation starting from 7.30-14.00, afternoon starting from 14.00-20.00 and night starting from 20.00-07.30.

**Table 1.**  
**Total working days pharmacy staff per year**

Code	Factor	Number
A	Working days	312 days/year
B	Annual leave	12 days/year
C	Education and training	1 days/year
D	National holidays	16
E	Average absence from work	-
F	Working time	8 hours/days
	Total working days = [A-(B+C+D+E)]	283 days/year
	Available working time = [A-(B+C+D+E)] x F	2,264 hours/days
	Total working days in minutes	135.840 minutes/year

The calculation result of available working time for a pharmacist is 283 days/year or 2,264 hours/year or 135,840 minutes/year (Table 1). These results differ from studies at other hospitals due to differences in factors such as the number of annual leave, working time and education and training.

To calculate the standard pharmaceutical workload, the average amount of time required to complete a main pharmacy activity is required (Table 2). Data on pharmaceutical activities performed at RSU Royal Prima Medan have an average amount of time to complete the pharmaceutical action, but we did not use the data due to differences in the results of observations. Therefore, we used the average number of pharmaceutical action times from the observations. The calculation results show the total number of staff requirements is 40.4.

We also conducted in-depth interviews to support the standard workload observation data. Pharmacists tend to work outside their main duties to support smooth work. These impacts the increasing number of workloads.

*"Yes, but not absolutely the same because all work starts from inputting, and the old system causes work to be slower."*(IF01, 37 years old)

*"For work in each shift, we help each other and do all the work that has not been completed. Not only work according to their respective duties, we also work on several other urgent tasks, especially if someone takes time off, the work will automatically increase."* (IF03, 26 years old)

The preparation of the standard allowance obtains an allowance factor for each category of HR covering each type of activity and the time needed to complete an activity that is not directly related to the main activity or service. The

standard allowance is divided into two, namely, the category allowance factor and the individual allowance factor. The total number of allowance factors is 0.15, which consists of

category allowances of 0.008 and individual allowances of 0.002.

**Table 2**  
**Standard workload per year and staff requirements in pharmaceutical installation**

Position	Productive Activities	Activity quantity (Total minutes/Year)	Standard Workload	Staff requirements	
Head of the pharmacy installation (n=1)	Prepare work plan	15,093	135,840.0	0.1	
	Coordinate, monitor, control non-existent drugs	33,960	135,840.0	0.3	
	Make a proposal for staff needs	6,000	135,840.0	0.0	
	Monitor and assess implementation	25,470	135,840.0	0.2	
Pharmacist (n=4)	Receiving prescriptions, inputting, analyzing, confirming recipes	28,300	13,584.0	2.1	
	Receive and re-check drugs from the warehouse	12,735	45,280.0	0.3	
	Explaining medication to outpatients	14,150	13,584.0	1.0	
	Organize work documents	8,490	45,280.0	0.2	
	Tidy up work equipment	4,245	45,280.0	0.1	
	Check drug stock	16,980	45,280.0	0.4	
	Discuss work problems	8,490	45,280.0	0.2	
	Prepare drug requests	25,470	45,280.0	0.6	
	Pharmacist assistant (n=24)	Making concoctions drugs	42,450	13,584.0	3.1
		Prepare non-concoction drugs	22,640	13,584.0	1.7
Accept free sales and explain to patients		19,810	13,584.0	1.5	
Preparing medical supplies and medicines for operation room		50,940	45,280.0	1.1	
Verification		76,410	15,093.3	5.1	
Issuing and re-checking the stock of certain/limited hard drugs		114,615	15,093.3	7.6	
Re-check drug dispensing		38,205	15,093.3	2.5	
Preparing medical supplies and emergency medicine		50,940	45,280.0	1.1	
Delivering medicine to outpatient room		67,920	45,280.0	1.5	
Organize and separate medicine into shelves		101,880	45,280.0	2.3	
Issuing and making reports on stockpiling of certain/limited hard drugs		38,205	45,280.0	0.8	
Make an official assignment		76,410	22,640.0	3.4	
Receive mutation of goods from warehouse		76,410	22,640.0	3.4	

The results of the interview show that meeting activities are the most time for pharmacists to get more time.

*"...it can take 30 minutes-1 hour for each meeting to be held every 2 weeks. Usually, this meeting can be while*

*stealing time while activities in the room."* (IF01, 37 years old)

The final step in the WISN method is in calculating the number of pharmaceutical staff needs. The calculation results show that the number of pharmacy units needed is 41 pharmacy units.

**Table 3**  
**Personal Time Allowance**

Category	Time (minutes)	Activities/ year	Time/year (minutes)	Allowance
Meeting	90	12	1080	0,008
Amount of training time per year	60	5	300	0,002
Evaluating work	60	12	720	0,005
Total				0,015

The results of the calculation of the WISN ratio show a value of 0.7. If the WISN ratio is < 1, it means that the existing human resources are insufficient and not in accordance with the amount of workload. Currently, the number of human resources in the pharmacy unit is 29 members and the head of the room, while the number of

human resources required according to the WISN method are 41 members, so the number of implementing members in the pharmacy unit at Prima Royal Hospital Medan is 11 people.

**Table 4**  
**Determining staff requirements based on WISN**

Total number of staff requirements	40.4
Standard allowance	0.015
Number of staff requirements using the WISN method	40.45
The current number of staff	29
WISN ratio	0,7

This study was conducted at the Pharmacy Installation of the Royal Prima Hospital, Medan, which has 29 pharmacists. Planning the need for pharmacy staff at the Royal Prima Hospital Medan when viewed from the flow of the policy process has not been well structured. Human resource management, especially the planning of pharmaceutical staff needs so far only uses job description analysis based on a set time in one day. In actual conditions, pharmaceutical officers do not only perform service activities but also perform other activities (Shao et al., 2020). This is what underlies the researcher to analyze the workload and determine the number of pharmaceutical workers needed based on the real workload by using the Workload Indicator Staffing Need (WISN) method.

The pharmacy installation at the Royal Prima Hospital in Medan is one of the work units that has a high workload. The pharmacy installation performs various activities related to nursing and nonmedical services that support it. The pharmacy installation works in three work shifts, namely, morning shift, afternoon shift and night shift so that the different working shift conditions can affect the difference in the workload it receives. The activities of the pharmacy unit that spend the most time are productive activities of 3450 minutes, the second activity is performed with a nonproductive value of 2060 minutes while the least productive activities are performed on personal activities with 928 minutes. These data show that the activities that are performed by the pharmacy installation are productive pharmaceutical activities. This is because productive activities require a lot of time and must be completed according to procedures.

Calculation of the proportion of working time is important as a basis for knowing the work capacity so that there is a balance between the available staff and the workload (Namaganda et al., 2015). A study conducted in Portugal showed that dispensing drugs is still the most time-consuming activity in pharmacies. Pharmacists spend half a day working hours interacting with customers and patients (Gregório et al., 2017). In UK, studies show that 85.3% of activities performed by pharmacists are productive activities (Walker et al., 2020).

In this study, the results of calculations using the WISN method obtained that the number of staff needs was 40.4 and then added to the total standard allowance of 0.015. So the number of implementing officers needed is 40.45 rounded up to 41 implementing officers. From the results of the calculation of the WISN ratio, a ratio of 0.7 can be obtained and it can be concluded that the number of staff in the unit is insufficient and not in accordance with the workload (WISN ratio < 1). The number of pharmacists in the Royal Prima Medan Hospital is 29 people, while the number of needs according to the WISN method is 41 people. So the total shortage in the pharmacy installation is 12 staff.

Several studies in Indonesia that both use the WISN method show that current staff do not meet the workload in accordance with established professional standards (Susanto et al., 2017; Yulaika & Dzykryanka, 2018; Ronggonundarmo et al., 2019). The lack of the required number of

workers causes high workload conditions, which can decrease productivity, which will trigger work stress (Rajan, 2018). Work stress on pharmacists can affect the assessment and quality of prescription reading. Studies show that pharmacists feel the need for rewards, career development and incentives as their activities and demand change (Boyle et al., 2015).

Other efforts can be made by the hospital in managing workloads such as recruiting according to the field of expertise, placing employees according to their respective competencies and expertise (Chui et al., 2014). In addition, implementing a clear work system, avoiding giving work beyond the ability of the employee, focusing employees on one task at a time, providing breaks and work shifts, and providing assistance to areas that are felt to be in crowded service positions (Lea et al., 2012; James et al., 2013).

## CONCLUSIONS AND SUGGESTIONS

The use of working time by pharmacists for productive activities is 3450 minutes/day, non-productive activities are 2060 minutes/day, and personal activities are 928 minutes/day. The result of calculating the need for labor using the WISN method produces a WISN ratio of 0.7. The current number of human resources in the pharmacy unit is 29 people. The total need for pharmacy staff according to the WISN formula is 41 people, so the shortage of pharmacists in the pharmacy unit is 11 people. It is recommended for hospital management to determine the duties and functions in accordance with the SOP because there are several non-productive activities performed by officers in the pharmacy installation. Meeting the number of staff shortages through recruitment can be a way to reduce the workload of pharmaceutical workers. Giving appreciation and additional incentives may be considered by hospital management, given the increasing workload.

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## Ethical Consideration

This research has received ethical approval from the Health Research Ethics Committee of Universitas Prima Indonesia with No: 002/KEPK/UNPRI/X/2020.

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