
**MEDICINE SUPPLIES PLANNING ANALYSIS BY USING CRITICAL INDEX ABC
METHOD AT PHARMACEUTICAL INSTALLATION AT RSU PKU
MUHAMMADIYAH BANTUL**

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ABSTRACT

The purposes of Hospital can be provided well, is required to set policy and decision making, one of the aspects that needs to do the management of medicine. This study used quantitative descriptive analysis designs and retrospective data collection. The analysis method used critical index ABC analysis. The results of the study used the critical index ABC method which group A is consisted of 69 medicines (7.3%), group B is consisted of 262 medicines (27.4%) and group C is consisted of 624 medicines (65, 3%). The critical index ABC method can help the hospital to plan the medicine usage by considering the usage value, investment value, and medicine criticality value. The list of standard medicines or medicine formularies has become another important aspect in medicine planning that will be the doctor's reference in giving therapy.

Keywords: The Critical Index ABC Method, Pharmacy Installation, Hospital Management

INTRODUCTION

Hospital pharmacy service is one of the activities in hospitals that support quality health services.¹ In order to provide the purposes of hospital well, it required the ability to set policy and decision making. One of the aspects that is required in determining policy and decision making is hospital management, especially medicine management.²

The pharmaceutical service is a supporting service and is also the main revenue center of the hospital. More than 97% of hospital health services used pharmaceutical supplies (medicines, chemicals, radiology materials, medic gas, medical equipment and health equipment). Pharmaceutical supplies, one of which is one of the highest components in the health budget, accounted for more than 15.2% of the world's total health budget in 2000.³ According to Khurana³ and Mahatme⁴ about 35% of the hospital's routine budget is spent on pharmaceutical supplies including medicines. Research data collected by Laeddei found that the pharmaceutical installation is 25% to 27% of the total cost of hospital expenses. In developing countries such as

Indonesia, spending to absorb 40-50% of the overall cost of the hospital or it can be said is the largest component of hospital expenditure.^{5&6}

From the data above, we can see the importance of medicines in providing great consequence of the medicine budget. Medicines in hospitals for medicines and medical devices managed by pharmaceutical installations reach 50-60% of the entire hospital budget.³ Medicine management is closely related to hospital budgets and expenditures. Regarding to the cost of hospital medicine can amount to 40% of total health costs. According to the Depkes RI, nationally the cost of medicines is 40 - 50% of the total operational health. Once the importance of funds and medicine position for the hospital, then its management must be done effectively and efficiently so as to provide the greatest benefits for patients and hospitals. Such management includes selection and planning, procurement, storage, distribution and use.⁷

The pharmacy installation of RS PKU Muhammadiyah Bantul is the only unit in charge of managing medicines and other pharmaceutical supplies at RS PKU Muhammadiyah Bantul. During 2011 - 2013, IFRS PKU Muhammadiyah Bantul manages over 2000 pharmaceutical supply items, of which approximately 80% of the total items are medicines.

From the medicines availability at IFRS PKU Muhammadiyah Bantul, not all medicines should get the same priority attention. In the management of medicine supplies controlling, these medicines are the main focuses of attention by monitoring and evaluating a more rigorous evaluation than the B and C category. The optimal planning and controlling is focused on the types of medicines with a large investment value will be more effective and efficient, which the level of supply is not only able to meet the necessity of medicines but also incurring a small cost. The medicines procurement that has been done at IFRS PKU Muhammadiyah Bantul is based on the request for the pharmacy service. The number of medicine orders is determined by the daily medicine consumption, without any optimal calculation for the number of medicine order.

Based on the description of the researchers interested in conducting research in "Analysis of medicine supplies planning by using Critical Index ABC Method in Pharmaceutical Installation at RSU PKU Muhammadiyah Bantul"

METHOD

This research used descriptive quantitative analysis designs with the approach for critical index ABC analysis method, which is analysis method by using usage analysis method, investment, critical index that used adjustment of the medicine of VEN (vital, essential and non essential) based on the list of emergency medicines, 10 most common diseases, Fornas, clinical pathway and clinical practice guidelines and critical index ABC analysis. Retrospective data collection that used data recapitulation of medicine usage in 2015. This research was done in Pharmacy Installation of RSU PKU Muhammadiyah Bantul. In this research, which is studied is the

medicine requirement planning by using method of pharmaceutical supplies planning analysis with critical index ABC method.

RESULT

The Classification of Medicines By ABC Analysis Based on The Usage Value In 2015

| Group | Number of drug items | (%) | Usage | (%) |
|---------------|-----------------------------|------------|--------------|------------|
| A | 106 | 7,8 | 3.452.297 | 75 |
| B | 256 | 18,8 | 925.477 | 20 |
| C | 997 | 73.4 | 228.161 | 5 |
| Jumlah | 1359 | 100 | 4. 605. 935 | 100 |

Source: processed secondary data

From the calculation of ABC usage analysis, group A is with the total usage of 75% from the total usage and is consisted of 106 medicines or 7.8% of the total of medicines. The total usage of Group B is 20% of the total usage by total of 256 or 18.8% of total medicinal items. Group C has a usage value of 5% of the total usage and has median medicines of 997 or 73.4% of the total number of medicines.

The Classification of Medicines with ABC Analysis Based on Investment Value in 2015

| Group | Number of drug items | (%) | Jumlah Investasi | (%) |
|---------------|-----------------------------|------------|-------------------------|------------|
| A | 212 | 15,6 | 8,543,250,393.1 | 74,9 |
| B | 357 | 26,3 | 2,292,695,273.4 | 20,1 |
| C | 790 | 58,1 | 570,056,747.53 | 5 |
| Jumlah | 1359 | 100 | 11.406.002.414,0 | 100 |

Source: processed secondary data

From the calculation result of ABC analysis, the investment value of group A is Rp. 8,543,250,393.15 (74.9%) of the total investment cost and is consisted of 212 medicines or 15.6% of the total medicines. The investment value of Group B is Rp 2,292,695,273.42 (20.1%) of the total investment cost 357 or 26.3% of the total medicines. The investment value of Group C is Rp 570,056,747.53 (5%) of the total investment cost and has the total number of medicines of 790 or 58.1% of the total medicines.

The Classification of Medicine with ABC Analysis Based on Critical Medicine Values in 2015

| Group | Number of drug items | (%) |
|--------|----------------------|------|
| X | 166 | 12,2 |
| Y | 133 | 9,8 |
| Z | 569 | 41,9 |
| O | 491 | 36,1 |
| Jumlah | 1359 | 100 |

Source : processed secondary data

From the calculation, the critical value of group X is consisted of 166 medicines or 12.2%. The critical value of group Y is 133 or 9.8%. The ZI is 569 or 41.9% of the medicines. Group O has a total of 491 or 36.1% of medicines.

The Classification of Medicines Based on the Critical Index ABC Analysis

| Group | Number of drug items | Persentase (%) |
|--------|----------------------|----------------|
| A | 69 | 7,3 |
| B | 262 | 27,4 |
| C | 624 | 65,3 |
| Jumlah | 955 | 100 |

From the calculation result of critical index ABC analysis, the critical value of group A is 69 or 7.3% from total medicines. The critical value of group B is 262 or 27.4% of the total medicines. The critical value of group C is 624 or 65.3% of the total medicines.

DISCUSSION

The main concern in supplies control is the preparation of Standard Medicines List (DOS) or Fomularium at PKU Muhammadiyah General Hospital of Bantul. In carrying out pharmaceutical supply management, the policy of choosing and placing DOS or Fomularium, medicines selection based on the amount of medicines usage and disease pattern in hospital which is adjusted to hospital service, planning, procurement, acceptance, storage, distribution, controlling, administration, reporting and evaluation. Control of pharmaceutical stock of supplies, aims to improve the accuracy of use, pharmaceutical supplies in accordance with the use, avoid over stock / lack, stock control is near expiration date.

From the data of medicines usage as much as 1359 medicines during one year for the period January - December 2015 is grouped by using ABC analysis. ABC analysis is done based on usage, investment and critical index by adjustment using VEN method.

USAGE VALUE

From the analysis result of ABC Usage (attachment) obtained data as follows: Group A consists of 106 medicines (75%). Group B consists of 256 medicines (20%). Group C consists of 997 medicines (5%). From the results it can be seen that 75% of total medicines use only uses 106 types of medicines, while 5% of total usage consists of 997 types of medicines. For group A medicines with the highest amount of use, it is necessary to ensure sufficient stock to avoid shortage of stocks that may impede service to patients in the hospital and may cause harm to the hospital. It is expected that RSU PKU Muhammadiyah Bantul stipulates the use of Standard Medicines List or revised formulary every year. Determination of the list of standard medicines in RSU PKU Muhammadiyah Bantul aims to have uniformity in the use of medicines, so the possibility of Expired Date medicines because no move can be suppressed or reduced.⁸

Based on the ABC analysis data, the use of many medicines belongings to the C group that are not very widely used or can be said that the medicines are included in the category of slow moving. For medicines in group C this should be done efficiently by reducing the number of medicines items. medicines included in group C can be performed by returning large quantities of medicines items or performing similar medicines replacements. In addition, the reduction of the number of medicines items can also be done by replacing the procurement alternatives, for example by purchasing CITO for every medicine that is rarely used or if the medicine is more than one brand, then the slow moving brand is not ordered again or removed from Standard Medicines List or Fomularium.⁸

With the reduction of stored medicines items will facilitate the supervision and control. In addition, reducing the number of medicines items also reduces the likelihood of expired medicines and reduces the storage costs incurred by slow moving medicines.⁸

INVESTMENT VALUE

From the results of grouping of medicines according to ABC analysis of investments obtained as follows: Group A is consisted of 212 medicines (74.9%). Group B is consisted of 357 medicines (20.1%). Group C is consisted of 790 medicines (5%). It appears that 74.9% of the total investment value is Rp. 8.543.250.393,15, - used by 15.6% and the medicines included in group C ie 5% of the investment value of Rp. 570,056,747,53 used by 58.1%

Group A medicines resulting from ABC investments need to be given special attention on the supervision and control of their supplies because the value of large investments can lead to large storage costs and the amount of hospital losses in case of medicines damages.

Grouping by means of ABC analysis can be used for supplies level control in a way⁹ pressing the per-unit price of items belonging to group A, paying particular attention to the control systems of groups A and B, stock and manage supplies equilibrium, provide safety stock on Group A and B inventories, as these two groups are the ones with the highest investment value, improve service by improving stock availability and suppress exit recipes.

Medicines control system with ABC Analysis method needs to be reviewed periodically because of price and usage changes influenced by disease and season trends. The ABC analysis review can be conducted annually in conjunction with standard medicines lists and the preparation of annual budget plans.

CRITICAL VALUE

The classification of medicines based on using a medicines' critical value is made on the basis of adjustment using the VEN method. From the grouping to the critical value obtained the following results: group X (A): 166 medicines (12.2%) of total medicines, group Y (B): 133 medicines (9.8%) of total medicines, group Z (C): 569 medicines (41.9%) of the total medicines, group O (O): 491 medicines (36.1%) of total medicines.

The classification of medicines by considering the critical value of the medicines based on it's impact on the health of the patient by considering the efficiency of the use of existing funds. Grouping the medicines by considering the critical value based on existing data on pharmaceutical installations at RSU PKU Muhammadiyah Bantul. Group X is based on medicines listed in the medicines list emergency. Group X or groups of vital medicines, is a very essential or vital group of medicines to prolong life, to overcome illness or cause of basic health services.⁷

This group should not be a vacuum¹⁰. This medicine belongs to a vital medicine so it must always be there when needed although the number is just a little. For that, strict control needs to be done by increasing the frequency of ordering but minimize the stock so as not to cause high storage costs.

Group Y is a medicines in the list of the top 10 disease medicines, clinical pathway and KDP in RSU PKU Muhammadiyah during the year 2015. Y group or group of essential medicine is a medicine that works causally is working on the source of disease, pharmaceutical logistics are widely used in medicine most of the disease. Cocokokongan medicines in this group can be trained less than 48 hours.¹⁰ This group of medicines has a direct impact on patient health, so it needs to do purchasing planning to keep the stock of medicines to continue to be available when needed.

Group Z is a medicine in the list of medicines fornas / DOEN that do not enter into the medicines of 10 major diseases. Group Z or groups of nonessential medicines, is a group of medicines to support the action or treatment to be better, for comfort or to overcome complaints. The group's medicines void can be tolerated for more than 48 hours.¹⁰

Group O is a medicines that is not included in the emergency medicine list, the top 10 medicines list and the list of medicines fornas / DOEN that are not included in the top 10 disease medicines. Group O is a group of medicines that cannot be classified into groups X, Y and Z.¹¹

The highest number of items was in the Z medicines group of 569 items or 41.9% and the O group amounted to 491 items or 36.1% of all medicines items. This indicates that the medicines have no direct impact on the health of the patient or even not used so an evaluation needs to be made whether the medicines still need to be held or can be arranged procurement only by order, so there is no need for risky supplies damage.

The approach is the same as at the time of medicines reduction or is eliminated in group O and group Z.¹² Groups belonging to group O become the first priority to be reduced or eliminated from the needs plan. Furthermore, if funds are still lack of medicines that enter the Z group into priority next to be reduced or eliminated from the needs plan. If after doing with this approach the available funds still do not do the next step.

CRITICAL INDEX VALUE (NIK)

Group A with NIK 9.5 - 12, 69 medicines items (7.3%) of medicines. The medicines in this group should not be unavailable considering the effect of therapy to the patient. Reservations can be made in small quantities but the frequency of ordering is more frequent and because of the considerable investment value has the potential to provide substantial profits to the hospital, this group requires strict monitoring and monitoring of medicines, accurate and complete records, and constant monitoring by influential decision makers, Pharmaceutical Installation and Head of Logistics Section directly. Booking can be in small quantity fixed order frequency more frequent.¹³

Group A medicines should always exist because their unavailability will cause great harms, medicines in group A are critically categorized for some users, or one or two users, but also have high investment and turnover values. Control of group A medicines should be very strict given

the very high level of medicines criticism and avoid the disruption of patient care. Control can be done every day or every week. Medicines planning for group A should be accurate according to an up to date data base. To ensure the availability of medicines, hospitals can increase the number of suppliers and reduce the order duration so that the distribution of medicines can run smoothly.⁸

Group B with NIK 6.5 - 9.4 of 262 items or 27.4% of the total medicinal items. The vacuum of this medicine can be tolerated no more than 24 hours, with the frequency of ordering less frequently eg every two weeks, but the number of reservations can be relatively more. Monitoring and monitoring of this group is not too late compared to group A, for example, every three or six months.¹³ Group B medicines should also be considered even though group B medicines are not available and are not fatal because they can be replaced with other medicines in the same composition so that the service is not delayed. Because group B has an investment value and high usage value so it must always be held to avoid losses.⁸

Group C with NIK 4 - 6.4, 624 items or 65.3% of the total medicinal items. The medication vacuum for this group can be more than 24 hours, with the frequency of ordering can be done less frequently, adjusted to the needs and available funds eg once once. Oversight and monitoring of these groups may be looser, for example, six months or once a year. Group C medicines, although little use and small (cheap) investment values should still be provided because their critical values are high. Medicines in group C can not be replaced so that although a little remains to be held so that it will not cause delayed service.⁷

From the results of the grouping of ABC analysis the critical index shows that a lot of medicines are included in group C. In order not to accumulate the stock of medicines group C, then some group C medicines whose small and important criteria are raised into group A in the sense that group C can replace group A when prescribed the medicines is absent or empty. And for group C medicines that are important and must be stock regulated and included in the list of standard medicines, while group C medicines that are not important after stock runs out can be removed from the standard list of medicines.⁸

From several similar studies conducted previously by Suciati and Adisasmita¹⁰ that the classification of medicines using ABC Critical Index analysis is highly prudent to prioritize the procurement and control of medicines use, making it more efficient and effective, especially for hospitals with limited funding and human resources. However, many medicines items also need to be reconsidered given the many different medicines items with different trade names but have the same effects. Due to the simplification of species and the number of medicines items, the use or application of Critical Index AB analysis would be easier to perform, especially the restriction in group C, given the very large number of 65.3% while the therapeutic effect is the only supporting medicines. For the need to perform and preparation and use of the Medicines Standard List (DOS) is indispensable. This is in accordance with research conducted by the

author, that by using ABC analysis can sort medicines with high usage value but and have a high critical value as a new priority and then other medicines. The critical index ABC analysis is very precisely done on the number of many medicines items that will further simplify the management in the procurement and storage of medicines. Taking policy in choosing the type of medicines to be used in a hospital should be done by many related parties to avoid this can make possible the existence of monopoly of certain suppliers and also can reduce the number of medicines that the critical level is low so that the accumulation of unused little.

For forecasting the need for further medicines can be done by determining the number of reservations based on EOQ and ordering time based on ROP as research conducted by Atmaja (2012). It's just that in this study, the authors did not predict the need for further medicines but provide medicines control solutions with priority methods in the ABC analysis of the critical index that can be used as a reference for the procurement of medicines for the next period.

CONCLUSION

Based on this research, it can be concluded as follows:

1. The results of ABC analysis about the usage value, which group A is consisted of 106 medicines (7.8%), group B is consist of 256 medicines (18.8%), and group C is consisted of 997 medicines (73.4%)
2. The results of ABC analysis about the investment value, which group A is consisted of 212 medicines (15,6%), group B is consisted 357 medicines (26,3%) and group C is consisted of 790 medicines (58,1%)
3. The results of ABC analysis about the critical index, which group A is consisted of 69 medicines (7.3%), group B is consisted of 262 medicines (27.4%) and group C is consisted of 624 medicines (65.3%)

A. Suggestion

Based on the above conclusions, the suggestions that can be given by researchers for PKU Muhammadiyah General Hospital of Bantul are:

1. The hospital tries to use ABC analysis and critical index ABC and combined with to determine the number of orders based on EOQ and it's order time based on ROP.
2. The hospital lists the Standard Medicines List (DOS) or Formulary which is evaluated every year.
3. Make efforts to reduce the non essential category medicines to avoid cost inefficiency.

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