

Analysis of Inventory Management of Outside used Materials with Min Max Method in JEC @ MENTENG

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DOI: 10.36347/sjebm.2019.v06i08.001

| Received: 28.07.2019 | Accepted: 04.08.2019 | Published: 18.08.2019

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Abstract

Original Research Article

The purpose of this study is to try to solve inventory problems in JEC @ Menteng, so that the company can set safety stock, minimum inventory, maximum inventory, and order quantities for each medical BHP needed so that inventory costs are saved. This research through the stages of ABC analysis to determine the group of items on each item, then proceed with the calculation of minimum inventory, maximum, safety stock, average inventory value, turnover ratio, inventory turnover and total inventory cost, followed by comparing the results of the method calculation min -max with company method calculation. The results of the study with the applied Min-max method turned out to be able to increase turnover ratio (TOR), inventory turnover (ITO), reduce the average inventory value and total inventory cost (TIC) so that the investment cost savings of Rp. 4,409, - for 2016 and Rp. 24,102,396, - for 2017.

Keywords: Inventory Control, Inventory Management Analysis, ABC Analysis, Min-Max Method.

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INTRODUCTION

Inventory management has several roles for a company, including to find a stage that is balanced between company costs and also the costs needed for purchasing, and storage costs. It aims to achieve inventory as much as possible at the minimum cost [1]. Analysis of inventory management in a company can be implemented properly if supported by warehousing facilities. The goal is that the inventory is always available so that it can quickly respond to customer needs. By analyzing and submitting inventory cases in the company and using the inventory model approach, the inventory problems can be resolved so that optimal inventory procurement policies are obtained at minimum costs.

The type of inventory needed in a company is not only one type of product, this can result in an uneven and irregular order schedule which will eventually lead to very large inventory costs. This happens because many products and the number of usage are not the same so the order schedule becomes irregular. For this reason, an appropriate and accurate purchase plan is needed so that the company can determine the quantity of inventory to be purchased as needed.

Zakaria, F [2] Minimum inventory is zero and maximum inventory is as much as economically optimal, which is in accordance with EOQ calculations. So you can imagine that exactly when the goods are finished, ordering the most economical goods came. But this is a theoretical calculation, meaning that in reality it cannot be guaranteed that the plan can be completely fulfilled. There is a possibility that the use of goods will change and increase suddenly, there is a possibility that the ordered item will arrive late, and so on.

According to Putra [3] in determining this minimum and maximum, it is best not to take extreme numbers, but there are safety factors that can be calculated based on experience. In the min-max system several conditions are used, namely:

- The amount of the order is not fixed or fluctuating.
- There is a safety inventory, namely a number of inventories prepared to deal with changes in demand.
- Has a reorder point, which is when inventory is at the minimum stock.

According to Zulian [4], inventory systems are constantly being carried out by continually looking at inventory records. The main disadvantage of a continuous inventory system is that it requires continuous auditing of the inventory in the warehouse so that it can be known exactly when reorder must be made. Further weaknesses will arise if:

- Re-ordering, number of orders and safety inventory every year do not change.
- Delays occur in entering transactions
- Errors in making and entering transactions.
- Many independent orders generate high costs.
- Discounts are usually based on the rupiah value of the order.

The number of fixed order systems with continuous methods is very profitable if the request is independent. Extreme use in situations like this will benefit from other systems because:

- A security inventory is only needed for a certain period of time.
- More efficient.
- Relatively unaffected by parameters and forecasting.
- Check inventory depending on how you use it.

The Min-max method is a continuous inventory system while the periodic inventory system, the number of items in the inventory is reviewed based on a fixed time interval. The weakness of the periodic system is that it requires a greater safety inventory compared to the system continuously. Based on the description above, the researcher chose the minimum-maximum method for solving inventory problems in JEC @ Kedoya because the existing inventory is independent and also the amount of safety stock is expected not to be much because it will increase storage costs.

The study was conducted by Ade Putri Kinanthi, Durkes Herlina, and Finda Arwi Mahardika [5] with the research title Analysis of Raw Material Inventory Control Using the Min-Max Method (Case Study of PT. Djitoe Indonesia Tobacco). The results of this study state that PT. Djitoe Indonesia Tobacco always orders tobacco with a small amount and accumulates inventory with excessive capacity. The results of the analysis using fishbone diagrams are known factors that influence the excess stock that exists, among others, man, method, money, and material. With the inventory control method, PT. Djitoe Indonesia Tobacco is able to save up to Rp. 700,000 for each period.

The research conducted by Careza Rizky, Yuli Sudarso, Sri Eka Sadriatwati [6] with the title of the study was the comparison analysis of the EOQ method

and the POQ method with the Min-Max method in controlling raw material inventory at PT. Sidomuncul Pupuk Nusantara. The results of this study state that from the analysis of company control comparison that has been carried out, the state of the company is not like the method applied (Min-Max method), the total inventory cost is in fact lower Min-Max method, because the ordering frequency is 24 times a year while the situation the actual company orders frequency as much as 7 times in 2014, as a result of the quantity of orders made by high companies between 100-300 kg per one time the message occurs in excess stock in the warehouse.

The research was conducted by Donnie Albar [7] with the research title Inventory Management Spare Part with Min-Max Method. The results of this study are applied to the Min-Max method, apparently it can increase the turnover ratio (TOR). Inventory turnover (ITO), decreases the average inventory value and total inventory cost (TIC) to obtain inventory cost savings of \$ 1,165.10 for 2014 and \$ 1,709.56 for 2015.

The research was conducted by Maulida Nurfajrianti, Yusuf Widharto [8] with the research title Evaluation of Inventory Control at PT XYZ. The results of this study state that PT. XYZ at the beginning of 2016 still had 1791 imported components. The Import component used in 2016 was 311 units. Calculation results are obtained by ITO every 102 days. By using the Min-Max Inventory, it is found that the minimum inventory is 872 units and the maximum inventory is 1652 units. To reduce imported component stock in 2017, it is recommended that PT. XYZ to order 102 units every 142 days and maintain a safety stock of 92 units.

Jakarta Eye Center (JEC) is an eye specialist hospital that has international service standards. JEC was established on February 1, 1984 in Menteng, developing into the most complete and most modern Eye Hospital and having a mission and commitment to be able to improve the quality of life of the community through eye health services. JEC always strives to be at the forefront of health services, especially for patients who have eye disorders. JEC developed into an eye hospital which now serves seven eye health disorder services. Seven services include Cataracts & Cataract Surgery Services (LASIK & Corneal Transplantation), Vitreoretina Service, Glaucoma Service, Oculoplasty Service (Eye Plastic Surgery & Eye Tumors), Contact Lens Service, Children Eye & Squint Clinic and Low Vision Care.

Currently the researchers see that there are indications that JEC @ Menteng has not implemented inventory controls efficiently because some of the BHPs are overstocked, but there are also a few (stockouts). This problem has occurred since 2013, where activities have increased but inventory has not

been managed properly. From Table-1, it can be seen for BHP medical items where the number of final stock is more than the average usage amount, there is an overstock indication, while for BHP medical items

where the final stock is less than the average usage there is an indication of less stock (stockout). The following are examples of BHP medical overstocks and stockouts.

Table-1: Overstock and Stockout Medical BHP 2017

No	Nama Barang	Stok Awal	Stok Masuk	Stok Keluar	Rata-Rata	Stok Akhir	Keterangan
1	23G CONSTELLATION COMBINED	6	138	138	12	6	Stockout
2	PROVISC 0.85 ALCON	0	1,349	1,349	112	0	Stockout
3	VISCOAT 0.75 ML ALCON	0	1,760	1,760	147	0	Stockout
4	PROCEDURE PACK 9.0/110	21	460	478	40	3	Stockout
5	DRAPE OPHTHALMIC	80	3,600	3,650	304	30	Stockout
6	LUCENTIS INJEKSI	10	249	255	21	4	Stockout
7	BSS OCUSOL	15	765	761	63	19	Stockout
8	NUPOVEL 10 MG / ML	35	490	510	43	15	Stockout
9	SARUNG TANGAN NO. 7.5	181	6,370	6,153	513	398	Stockout
10	ALKOHOL SWAB	1,015	22,300	21,815	1,818	1,500	Stockout
11	VENOCATH 24	0	230	110	9	120	Overstock
12	NEOSTIGMINE INJ	0	450	275	23	175	Overstock
13	IO-BLUE	0	250	200	17	50	Overstock
14	DOP MATA JEC	4,000	8,250	10,250	854	2,000	Overstock
15	MQA / SPONGE	40	620	560	47	100	Overstock
16	BLOOD SET	44	750	674	56	120	Overstock
17	VICRYL 6-0 W9552	0	192	163	14	29	Overstock
18	PANTOCAIN 0.5% ED	38	730	654	55	114	Overstock
19	SARUNG TANGAN NO. 7.0	288	1,470	1,518	127	240	Overstock
20	SARUNG TANGAN NON STERIL S	1,100	23,500	22,700	1,892	1,900	Overstock

Source: JEC (2017)

Based on Table-1, BHP medical was found to experience over-stock and stock out where inefficiencies in operational costs occurred such as storage costs due to over-stock and loss of opportunity to get revenue due to stock out.

Looking at the existing problems, it is necessary to control inventory by taking into account the minimum and maximum inventory that must be stocked and how much to order. The concept of maximum minimum inventory is developed based on a simple thought as follows. To maintain the continuity of operations of a company, certain types of goods in the minimum amount should be available in the inventory, so that they can be used directly, but not too many items are stored in the inventory, so the inventory costs do not become too expensive. So the inventory model that will be discussed in this study is the minimum and maximum inventory model, by taking a case study at JEC @ Menteng.

Considering that BHP inventory in JEC @ Menteng is very large, the BHP medical reaches 585 items, therefore all BHP medical items will be divided into several groups by using ABC analysis. The use of ABC analysis in inventory planning at JEC @ Menteng is intended to prioritize inventory planning that is often

used and is small in number, but has a large investment value. So if JEC @ Menteng can control inventory that is often used and is small in number, it has a large investment value. So if JEC @ Menteng can control inventory of group A and B, it means that it controls 80-95% of the inventory value used.

Based on the background and theoretical foundation above, the framework made in this study is as stated in Figure-1.

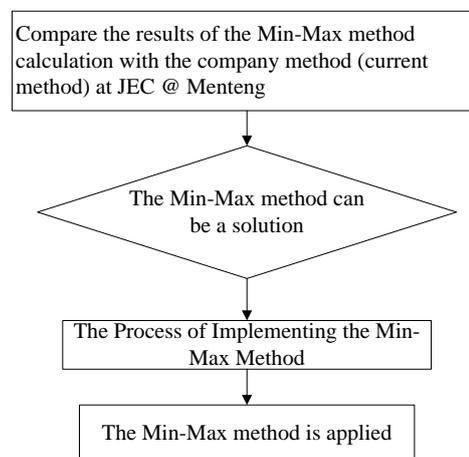


Fig-1: Conceptual Framework

Based on the phenomenon obtained, researchers want to help so that the inventory in JEC @ Menteng can determine the inventory management model so that it is more effective and efficient. Therefore this study has a purpose, including:

- To help find solutions to inventory problems in JEC @ Menteng by using the minimum-maximum inventory method;
- Calculating the minimum inventory amount, the maximum amount that needs to be ordered, safety stock, average inventory value, turnover ratio (TOR), inventory turnover (ITO) and total inventory cost (TIC) based on the minimum-maximum method; and
- Calculate the impact of saving inventory costs using the minimum-maximum method

METHOD

The type of research used in solving this problem is descriptive method. The selection of this descriptive method is because the researcher in addition to providing an overview of the phenomena that exist, but also explains the relationship, and get the meaning and implications of a problem that you want to solve.

This research is a case study to solve a problem that is carried out intensively and in detail as well as in depth to the object of the organization. The research objects discussed regarding inventory management analysis in JEC @ Menteng using the min-max method. For this reason, a preliminary study was initiated by conducting a direct review in the JEC @ Menteng Logistics unit.

In this study, processing and analysis of data focused on medical BHP materials as many as 585 types of items, which had been divided into 3 groups

based on the ABC analysis method. The research sample was conducted by sampling technique in probability or random sampling so that each item in groups A, B, and C had the opportunity to be a sample group, that is, each of the 2 items resulting in a total of 6 samples. Group A is a medical BHP of around 20% but has an investment value of around 80% of the total investment value. Group B is a medical BHP of around 30% but has an investment value of around 15% of the total investment value. While group C is a BHP medical with a number of types of around 50% but has an investment value of around 5% of the total investment value. To collect data used method:

- Interview or interview method, namely: a way to obtain data by conducting direct interviews with competent company employees, so that we can get an idea of the inventory system problems that exist in JEC @ Menteng, which in this study conducted interviews with the Head of Logistics Services.
- Documentation, namely the method of collecting data through existing documentation, is expected to obtain data about the use of medical consumables, lead time and number of orders.

RESULT

ABC Analysis Results

ABC analysis was conducted on BHP medical used in JEC @ Menteng. The amount in ABC analysis is the amount of usage in one year, from January to December 2016, the price in ABC analysis is the BHP price of medical, the cost is the multiplication of quantity and price. While cumulative is the cumulative amount of costs. The complete results of ABC analysis of BHP medical are in the appendix. The results of the ABC analysis contained in the appendix can be summarized to find out the groupings as in Table-2 below

Table-2: BHP Medical Grouping with ABC Analysis Based on the Number of Medical BHPs and the Cost Amount

Group	Total BHP Medic	Value	Percentage of BHP Medic	Percentage of Value
A	26	Rp. 17,266,214,697	4.08%	70.23%
B	82	Rp. 4,073,120,832	33.97%	20.06%
C	477	Rp. 1,973,242,576	61.95%	9.71%
Total	585	Rp. 20,312,578,105	100.00%	100.00%

Source: JEC, 2017

Based on ABC analysis as in Table-2 above, there are 26 items of medical BHP included in group A or 4.08% at a cost of Rp. 17,266,214,697 or 70.23%. Group B the number of BHP medical as many as 82

items or 33.97% with a cost of Rp. 4,073,120,832 or 20.06% and group C the number of BHP medical as many as 477 items or 61.95% at a cost of Rp. 1,973,242,576 or 9.71%.

BHP Medik Calculation for 2016 and 2017**Table-3: Medik Calculation for 2016**

No	BHP Medic	SS	Min	Max	O.Q
1	Lucentis Injeksi	3	9	15	6
2	Procedure Pack 9.0/110	7	19	31	12
3	Sarung tangan No. 7,5	73	227	380	154
4	Nupovel 10 MG/ML	8	21	34	13
5	Sarung Tangan Non Steril S	152	720	1287	567
6	Alkohol Swab	325	870	1415	545

Table-4: Medik Calculation for 2017

No	BHP Medic	SS	Min	Max	O.Q
1	Lucentis Injeksi	2	6	9	4
2	Procedure Pack 9.0/110	7	18	28	11
3	Sarung tangan No. 7,5	39	201	363	162
4	Nupovel 10 MG/ML	9	30	51	21
5	Sarung Tangan Non Steril S	240	900	1415	545
6	Alkohol Swab	188	780	1373	593

From the calculation of Table 3 seen in 2016 for medical Lucentis Injection has a Safety Stock of 3 items, a minimum value of 9 units, a maximum value of 15 units, and an order quantity of 6 units. The medical type Procedure Pack has a Safety Stock value of 7 items, a minimum value of 19 units, a maximum value of 31 units, and an order quantity of 12 units. Medical Gloves have a Safety Stock value of 73 items, a minimum value of 227 units, a maximum value of 380 units, and an order quantity of 154 units. The Nupovel type has 8 items of Safety Stock, a minimum value of 21 units, a maximum value of 34 units, and an order quantity of 13 units. Medical types of Non Sterile Gloves have a Safety Stock value of 152 items, a minimum value of 720 units, a maximum value of 1287 units, and an order quantity of 567 units. Medicinal type Alcohol SWAB has a Safety Stock value of 325 items, a minimum value of 870 units, a maximum value of 1415 units, and an order quantity of 545 units.

From the calculation of Table-4 seen in 2017 for medical Lucentis Injection has a Safety Stock of 2 items, a minimum value of 6 units, a maximum value of 9 units, and an order quantity of 4 units. The medical type Procedure Pack has a Safety Stock value of 7 items, a minimum value of 18 units, a maximum value of 28 units, and an order quantity of 11 units. Medical Gloves have a Safety Stock value of 39 items, a minimum value of 201 units, a maximum value of 363 units, and an order quantity of 162 units. The Nupovel type has 9 items of Safety Stock, a minimum value of 30 units, a maximum value of 51 units, and an order quantity of 21 units. Medical types of Non Sterile Gloves have a Safety Stock value of 240 items, a minimum value of 900 units, a maximum value of 1415 units, and an order quantity of 545 units. The SWAB alcohol type has a safety stock value of 188 items, a minimum value of 780 units, a maximum value of 1373 units, and an order quantity of 593 units.

Min Max Method 2016 & 2017**Table-5: Min Max Method 2016 & 2017**

Min Max	2016	2017
Total Persediaan	200.174.374	155.530.734
TOR	528,5	624,5
ITO	120,8	124,8
Biaya Pemesanan	19.664.438	19.664.617
Biaya Simpan	407.660.261	296.755.106
TIC	427.324.699	316.419.723

Based on Table-5 it is known that in 2016 the total inventory amounted to Rp. 200,174,374; TOR of 528.5; ITO of 120.8; Booking fee of Rp. 19,664,438; Cost of withdrawal of Rp. 407,660,261; and TIC Rp. 427,324,699.

In 2017 it is known that the total inventory is Rp. 155,530,734; TOR is 624.5; ITO of 124.8; Booking Fee of Rp. 19,664,617; Save fee of Rp. 296,755,106; and TIC Rp. 316,419,723

Company Policy Method Analysis

Table-6: Company Policy Method 2016 & 2017

Company Policy	2016	2017
Total Inventory	363.459.876	363.604.476
TOR	299	149,3
ITO	85,3	93,5
Ordering Cost	19.497.885	18.431.007
Holding Cost	407.831.222	322.091.113
TIC	427.329.108	340.522.120

Based on Table-6, it is known that in 2016 the total inventory amounted to Rp.363,459,876; TOR of 299; ITO of 85.3; Booking fee of Rp. 19,497,885; Cost of withdrawal of Rp. 407,831,222; and TIC Rp. 427,329,108.

In 2017 it is known that the total inventory is Rp. 363,604,476; TOR as much as 149.3; ITO of 93.5; Booking Fee of Rp. 18,431,007; Save fee of Rp. 322,091,113; and TIC Rp. 340,522,120

Comparison of Average Inventory Value between Company Policies and Min-Max Method 2016

Table-7: Comparison of Average Inventory Value between Company Policies and Min-Max Method 2016

No	BHP Medik	Company Policy	Min-Max Method
1	Lucentis Injeksi	192.780.351	104.422.690
2	Procedure Pack 9.0/110	163.350.000	90.296.250
3	Sarung tangan No. 7,5	3.024.000	2.184.570
4	Nupovel 10 MG/ML	3.155.625	2.303.606
5	Sarung Tangan Non Steril S	607.200	507.898
6	Alkohol Swab	542.700	459.360
	TOTAL	363.459.876	200.174.374

Based on Table-7 shows a decrease in Inventory Value on average after applying the Min-max method, in 2016 the company's policy of inventory value averaged Rp. 363,459,876, - after applying the

min-max method it drops to Rp. 200,174,374, -. This decrease is caused by the minimum inventory amount and maximum stock in the min-max method smaller than the company method.

Table-8: Comparison of the Average Inventory Value between Company Policies and the Min-Max Method in 2017

No	BHP Medik	Company Policy	Min-Max Method
1	Lucentis Injeksi	192.780.351	64.367.217
2	Procedure Pack 9.0/110	163.350.000	84.533.625
3	Sarung tangan No. 7,5	3.024.000	2.028.960
4	Nupovel 10 MG/ML	3.155.625	3.418.594
5	Sarung Tangan Non Steril S	660.000	676.500
6	Alkohol Swab	634.500	505.838
	TOTAL	363.604.476	155.530.734

Based on Table-8 shows a decrease in Inventory Value on average after applying the Min-Max method, in 2017 the company's policy of inventory value averaged Rp. 363,604,476, - after the min-max

method is applied it drops to Rp. 155,530,734, -. This decrease is caused by the minimum inventory amount and maximum stock in the min-max method smaller than the company method.

Table-9: Comparison of TOR, ITO, and TIC between Company Policy and Min-Max Method in 2016

No	BHP Medic	TOR		ITO		TIC	
		MP	MM	MP	MM	MP	MM
1	Lucentis Injeksi	63,8	97,1	11,3	20,9	238.362.194	234.442.327
2	Procedure Pack 9.0/110	159,3	68,8	10,6	19,2	177.507.000	181.844.850
3	Sarung tangan No. 7,5	15,5	84,7	14,7	20,3	4.723.632	4.494.006
4	Nupovel 10 MG/ML	34,0	61,8	13,6	18,6	4.552.515	4.495.714
5	Sarung Tangan Non Steril S	11,9	148,9	18,9	22,6	1.245.732	1.157.146
6	Alkohol Swab	14,5	67,2	16,2	19,1	938.035	890.656
	TOTAL	299,0	528,5	85,3	120,8	427.329.108	427.324.699

Based on Table-9 shows that:

- The increase in the value of BHP medical TOR after the min-max method was applied, in 2016 the company method for the TOR value was 299.0 to be 528.5 after the min-max method was applied.
- The increase in BHP medical ITO value after the min-max method was applied, in 2016 the company method for the ITO value of 85.3 became 120.8 after the min-max method was applied.
- There is a decrease in the value of TIC BHP medical after the min-max method is applied, in 2016 the company method for the TIC value is Rp. 427,329,108, - to be Rp. 427,324,699, - after applying the min-max method.

Table-10: Comparison of TOR, ITO, and TIC between Company Policy and Min-Max Method in 2017

No	BHP Medic	TOR		ITO		TIC	
		MP	MM	MP	MM	MP	MM
1	Lucentis Injeksi	8,5	69,9	6,4	19,3	153.881.560	139.722.915
2	Procedure Pack 9.0/110	10,6	57,0	9,4	18,2	171.263.400	162.052.275
3	Sarung tangan No. 7,5	17,3	164,1	15,4	22,9	4.930.272	4.693.968
4	Nupovel 10 MG/ML	17,0	97,1	22,7	20,9	7.721.604	7.361.021
5	Sarung Tangan Non Steril S	88,0	110,0	22,0	21,5	1.469.556	1.466.080
6	Alkohol Swab	7,9	126,4	17,6	22,0	1.255.727	1.123.465
	TOTAL	149,3	624,5	93,5	124,8	340.522.120	316.419.723

Based on Table-10 shows that:

- There is an increase in the value of BHP medical TOR after the min-max method is applied, in 2017 the company method for the TOR value is 149.3 to be 624.5 after the min-max method is applied.
- The increase in BHP medical ITO value after the min-max method is applied, the 2017 company method for the ITO value of 93.5 becomes 124.8 after the min-max method is applied.
- There is a decrease in the value of TIC BHP medical after the min-max method is applied, in 2017 the company's method for the TIC value is Rp. 340,522,120, - to be Rp. 316,419,723, - after applying the min-max method.

The application of the min-max method is proven to produce an average inventory value, a higher

TOR and ITO value. This shows that the use of the Min-max method is more efficient than the company method. A higher ITO value using the min-max method is caused by the average value of each BHP medical compared to company policy. The decrease in inventory value shows the existence of budget efficiency because with low inventory value, the required budget will be low too. An increase in the value of TOR and ITO shows a faster inventory turnover.

The higher the value of TOR and ITO shows the more efficient inventory management. Inventory turnover rate shows how many times the inventory was bought and resold. The higher the level of inventory turnover, the lower the amount of working capital needed and increasing the return on investment (ROI) value.

The Amount of BHP Medical Cost Efficiency with the Use of the Min Max Method

Table-11: BHP Medical Cost Efficiency with the Use of the Min Max Method 2016

No	BHP Medic	TIC			Percentage Efficiency %
		MP	MM	Difference	
1	Lucentis Injeksi	238.362.194	327	3.919.867	1,64%
2	Procedure Pack 9.0/110	177.507.000	181.844.850	(4.337.850)	-2,44%
3	Sarung tangan No. 7,5	4.723.632	4.494.006	229.626	4,86%
4	Nupovel 10 MG/ML	4.552.515	4.495.714	56.801	1,25%
5	Sarung Tangan Non Steril S	1.245.732	1.157.146	88.585	7,11%
6	Alkohol Swab	938.035	890.656	47.379	5,05%
	TOTAL	427.329.108	427.324.699	4.409	0,00%

Based on Table-11 shows the existence of the difference in Total Inventory Cost (TIC) between

company policies and the min-max method, although not much, that is Rp. 4,409

Table-12: BHP Medical Cost Efficiency with the Use of the Min Max Method 2017

No	BHP Medic	TIC			Percentage Efficiency %
		MP	MM	Difference	
1	Lucentis Injeksi	153.881.560	139.722.915	14.158.646	9,20%
2	Procedure Pack 9.0/110	171.263.400	162.052.275	9.211.125	5,38%
3	Sarung tangan No. 7,5	4.930.272	4.693.968	236.304	4,79%
4	Nupovel 10 MG/ML	7.721.604	7.361.021	360.583	4,67%
5	Sarung Tangan Non Steril S	1.469.556	1.466.080	3.476	0,24%
6	Alkohol Swab	1.255.727	1.123.465	132.263	10,53%
	TOTAL	340.522.120	316.419.723	24.102.396	7,08%

Based on Table-12 shows the difference in Total Inventory Cost (TIC) between company policies and the min-max method which is Rp. 24,102,396, - or 7.08% for 2017, which means that the inventory with the Min-max method is more cost effective at Rp. 24,102,396, -

DISCUSSION

Based on previous calculations, it can be seen that the application of the min max method is evident from the decrease in the average inventory value and the TIC and the increase in TOR and ITO caused by the following factors:

- Increasing the value of TOR after applying the min-max method is caused by the end of the stock being smaller than the method of the company
- The increase in ITO value after the min-max method is applied is caused by the average inventory value lower than the company method
- Decrease in the average inventory value after the min-max method is applied due to the minimum and maximum inventory amount smaller than the company method
- Decreasing TIC after the min-max method is determined due to the amount of the save cost plus the lower cost of the message compared to the company method

CONCLUSION

Based on the results of the research described above, the conclusions in this study include:

- The maximum minimum inventory method is able to provide alternative solutions for inventory problems in JEC @ Menteng, by applying the Min-max method it has been proven to be able to increase TOR and ITO and reduce the average value of inventory and TIC which indicates inventory management becomes more efficient
- Based on the results of calculations according to the maximum minimum method, give results, including:
 - a. In 2016, the average inventory value using company policy was Rp. 363,459,876,-, but after the min-max method was applied it dropped to Rp. 200,174,374, -
 - b. In 2017, the average inventory value using company policy is Rp. 363,604,476,-, but

after the min-max method was applied it dropped to Rp. 155,530,734.-.

- c. In 2016 the value of BHP medical TOR increased after the min-max method was applied. The company method for the TOR value is 299.0 to be 528.5 after the min-max method is applied. The company method for the ITO value of 85.3 becomes 120.8 after the min-max method is applied. TIC value of company method Rp. 427,329,108, - to Rp. 427,324,699, - after applying the min-max method.
 - d. In 2017 there was an increase in the value of BHP Medical TOR after the min-max method was applied, in 2017 the company's method for the TOR value was 149.3 to be 624.5 after the min-max method was applied. company method for ITO value of 93.5 becomes 124.8 after the min-max method is applied. TIC value of company method Rp. 340,522,120, - to Rp. 316,419,723, - after applying the min-max method.
- Impact of saving inventory costs by using the minimum-maximum method in JEC @ Menteng in the amount of Rp. 4,409, - for 2016 and Rp. 24,102,396, - for 2017.

SUGGESTION

Based on the conclusions described above, the suggestions that can be given include:

- JEC @ Menteng is recommended to use the maximum minimum method, so inventory management contained in JEC @ Menteng can be more accurate in planning future needs.
- In BHP medical procurement planning JEC @ Menteng should pay attention to the re-order points, maximum number, order quantity and safety stock so that there is no inventory shortage or excess inventory, which can lead to inefficient inventory management.
- It needs ABC analysis of BHP medical in JEC @ Menteng, so that it can determine which BHP medical needs to be prioritized.
- This research was conducted at BHP medical in general at Mata Special Hospital, so that it is expected to be a trigger for academics to be able to continue the research design

specifically for AV categories (A Pareto and V for vital drugs) in General Hospitals and able to expand the scope of research by developing again to the stage of preparing forecasting based planning for a certain period.

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