Lean Implementation; The Journey From Theresia 2 Pavillion At Rk Charitas Hospital, Palembang

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Abstract: This research aim to explore an implementation of lean in Theresia 2 Pavilion of RK Charitas Hospital Palembang. This study start from step taken by the team, after training, is to prepare a process map and plan a Kaizen for a week in early January 2017. We had also developed objectives and policies that need to be followed to keep lean implementation in progress and sustainable. To assist the implementation, we provided standardized work steps displayed through simple visual images. The work was carried out through the principle of 6S namely sort, straighten, sweep, standardize, sustain, and safety. These results noticed Medical devices have been reduced by 47% while raw material group items are even completely lost. Topical powder, lotion, and liquid groups were reduced by 11% while cream even decreased by 78%. Infusion decreased by 33% while the other group as much as 11% and suppository as much as 40%. Only a few injection groups increased by 2% from December 2016 position. This research show that lean implementations do manage to decrease inventory in certain items and overall items in the hospital. Similarly, lean assuredly improves patient visits to inpatient installations either wholly or by patient class as well. However, the full benefits remain undetected in the first and second months of implementation.

Index Terms: Lean, Medical Inventory, Theresia 2 Pavilion, Kaizen, Sort, Straighten, Sweep, Standardize, Sustain, And Safety

1. INTRODUCTION

In an effort to improve the quality of health services, many hospitals implement quality management model such as TQM (Total Quality Management - Integrated Quality Management), Total Productive Maintenance (TPM), and Lean. Lean is the most commonly used quality improvement method (Papadopoulos et al, 2011). However, there are still few reports on the successful implementation of lean in hospitals in Indonesia. Of the few hospitals that seek to implement lean implementation in Indonesia are RSI Unisma Malang [1], Klaten Islamic Hospital [2], and Kemang Medical Care Hospital [3]. The lack of reports on lean implementation in existing hospitals in Indonesia raises the need to report on more implementations. This is especially due to the implementation of lean has been implemented in many hospitals in the world and provide promising results. Examples of cases that occur in Indonesia can be expected to contribute to the effectiveness and success and constraints factors in lean implementation in the healthcare sector. Lean is a method of quality improvement aims at reducing waste in an organization. This method relies on three assumptions namely (1) that it is possible to determine value and waste from the consumer's point of view so wasteful activities can be determined, (2) there is a measurable benefit to the organization in reducing non-value-adding activities such as in the form of cost reduction and increased competitiveness; and (3) freeing resources helps in enhancing organizational growth [4]. There is a lot of waste that can arise in the operation of a hospital that can be improved by lean implementation. A number of examples of waste that can be found include [5]:

- Transport waste, such as staff who have to walk to the other end of the ward just to take notes, or supplies stored in a central point rather than at the place of utilization, so additional transportation is required to bring supplies to the place of utilization from the storage center.
- Waste of inventory, such as excess of unused inventory in warehouses, long waiting lists, and patients have to wait their turn to be repatriated.
- Wasteful movements, such as staff movements that do not need to search for paper, such as sheets of medicine, for not being kept in the right or distant places; do not provide basic equipment in every examination room so healthcare workers are forced to move more frequently to take the basic tools.
- Waste of time, such as patient waiting time, room staff, examination results, prescriptions, and medications; the doctor's waiting time to repatriate the patient.
- Production waste, such as excessive and repetitive tests in pathology, or providing an inquiry slot just in case.
- Waste of process, such as duplication of information or repeated patient examination.
- The occurrence of rectification, such as re-admission due to failed repatriation or drug side reactions, and repeated tests because there is no correct result.

In this article, reported a lean effort carried out at an inpatient unit at a private hospital in Palembang, South Sumatra, named RK Charitas Hospital. This hospital is the largest hospital in Palembang with a capacity of 392 bedrooms, consisting of 13 VIP rooms, 14 VIP rooms, 91 class I rooms, 123 class II rooms, 91 class III rooms, 11 ICUs, 4 HCUs and 45 TT Neonatal. Specifically, the pavilion highlighted in this study is Theresia 2 Pavillion at RK Charitas Hospital.

2. METHOD

Theresia 2 Pavilion is one of two pavilions at Charitas Hospital to accommodate inpatients. Lean was implemented in this pavilion to reduce the amount of inventory while increasing the number of patients it can serve. The first step taken by the team, after training, is to prepare a process map and plan a Kaizen for a week in early January 2017. We had also developed objectives and policies that need to be followed to keep lean implementation in progress and sustainable. To assist the implementation, we provided standardized work steps displayed through simple visual images. The work was
carried out through the principle of 6S namely sort, straighten, sweep, standardize, sustain, and safety. Every day, managers were asked to work with staff to identify what improvements could be made and to do so and to see the progress of the previous day as well as to improve the constraints that occurred in the previous day's efforts.

3 RESULTS
In the early stages, we noticed an excess inventory in the miscellaneous groups of other devices and suppositories, while there were shortcomings for the group of creams, infusions, and injections. Overall, in the first month we found no waste or overload on inventory so there was relatively no change in inventory. In February, the inventory of medical equipment turned out to be excessive, looking at the number of patients and previous use. We also observed waste in creams and infusions as well as other groups. This month, there was a huge inventory reduction by 24%. In the following month, we could reduce our inventory even more by 25%. Despite changes due to uncertainty in consumer demand, the Wilcoxon test results (due to abnormal data) still found significant differences between inventory numbers before (December 2016) and after lean implementation (January, February, and March 2016), as shown in Table 1 and 2.

Table 1 The Result of T-test on Baseline Inventory in Dec with Jan, Feb, and Mar

<table>
<thead>
<tr>
<th>Description</th>
<th>Periode : 01-Dec-2016</th>
<th>Periode : 01-Jan-2017</th>
<th>Periode : 01-Feb-2017</th>
<th>Periode : 01-Mar-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Devices</td>
<td>21.880.165</td>
<td>21.785.102</td>
<td>17.199.09</td>
<td>11.546.030</td>
</tr>
<tr>
<td>Raw Materials</td>
<td>95.000</td>
<td>95.000</td>
<td>95.000</td>
<td>0</td>
</tr>
<tr>
<td>Power, Lotion, Topical Liquid</td>
<td>311.787</td>
<td>311.787</td>
<td>311.787</td>
<td>276.576</td>
</tr>
<tr>
<td>Cream</td>
<td>259.600</td>
<td>317.680</td>
<td>265.760</td>
<td>58.080</td>
</tr>
<tr>
<td>Injection</td>
<td>582.480</td>
<td>602.755</td>
<td>651.701</td>
<td>594.861</td>
</tr>
<tr>
<td>Others</td>
<td>808.335</td>
<td>705.870</td>
<td>432.630</td>
<td>717.255</td>
</tr>
<tr>
<td>Suppositories</td>
<td>117.612</td>
<td>94.089</td>
<td>94.0</td>
<td>70.567</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30.434.558</strong></td>
<td><strong>30.746.001</strong></td>
<td><strong>23.497.825</strong></td>
<td><strong>17.512.429</strong></td>
</tr>
</tbody>
</table>

For further details, Table 2 is transformed into graphic form as shown in Figures 1, 2, and 3. It appears that anomalies are found in cream inventories that had an increase of 22%, infusion with a 7% increase, and injection increased 3% in January. In February, the injection increased again due to an urgent need of up to 8%. In March, the other inventories rose by 66%. However, in general, inventories have decreased.

Figure 1 Changes in Inventories for Groups with Value below IDR 1 million

Figure 2 Changes in Inventories for Group with Value above IDR 1 million

Figure 3 Overall Change in Inventory
In the patient's room, we observed that there was a waste of patient class typology. We observed that patients in the VIP class was divided into VIP, VIP Plus, and VIP B. The number of VIP B patients was much higher than that of VIP and VIP Plus patients. Therefore, we considered the presence of VIP and VIP Plus spaces a waste. We only left VIP room B as VIP class. Meanwhile, class I also consisted of classes IA, IB, and I, while class I was too small compared to class IA and I B. We eliminated class I. Similarly, for class II, we eliminated class II because there has been class II B which had more consumers.

For the number of residents, we found a large increase in March as many as 20 patients per day, compared to December's only 17 patients per day, January with 18 patients per day, and February as many as 17 patients per day. In March we added a VIP room for BPJS but only 7 patients, only 1.13% of total patients in March.

Of the six existing classes from December to March, only one class, i.e., class II B has decreased consistently. This decrease is 16% from 70 patients in December into 59 patients in March. Meanwhile, all the other classes have improved. Patients in the VIP class even increased by 131% from just 29 people in December into 67 people in March. Meanwhile, first class B patients increased by 56% from 50 people to 78 people. Overall, the increase was 20% in all treated patients. However, as demonstrated in Figure 4, the increase only has a certainty of 63.5% due to a substantial decrease in February.

**Figure 4 Growth of the Number of Monthly Inpatient**

4. CONCLUSION
The above results show that lean implementations do manage to decrease inventory in certain items and overall items in the hospital. Similarly, lean assuredly improves patient visits to inpatient installations either wholly or by patient class as well. However, the full benefits remain undetected in the first and second months of implementation.

5. REFERENCES