Lean Implementation; The Journey From Yoseph 1 Pavillion At RK Charitas Hospital, Palembang

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Abstract:This research aim to explore an implementation of lean in Yoseph 1 Pavilion of RK Charitas Hospital Palembang. This study start from step taken by the team, after training, training, was to organize the Value Stream Mapping (VSM) of this pavilion, to identify existing wastes. Waste identification allowed the team to see what improvement opportunities can be made. After carrying out the VSM, the known wastes became the subject to the 5 S process, ended with standardization of work. These results noticed that 50% of powder, lotion, and topical liquid inventories. While cream and infusion were reduced by 53% and 46% respective, while for health equipment reduced by 37%. Overall, after the 5S process, inventories in January decreased 39% of inventories in December 2016. This research show that lean implementations do manage to decrease inventory in certain items and overall items in hospitals. Similarly, lean assuredly increase the number of patient visits to inpatient installations either wholly or by patient class as well.
Index Terms:Lean, Medical Inventory, Yoseph 1 Pavilion, Value Stream Mapping (VSM), 5S, Standardization of Work

1 INTRODUCTION

Indonesia has entered the fourth year in the implementation of the national universal health insurance through BPJS Health program. In this fourth year, there are still many service quality problems that healthcare providers need to improve, especially hospitals or advanced healthcare facilities [1]. With only 280,000 hospital beds serving 257 million people, Indonesia is one of the world's smallest bed populations [2]. In these limitations, it is difficult for hospitals to improve the quality of their care when patients are full and queuing. But improving the quality of service becomes a necessity, as the number of hospitals and beds increases from year to year. In fact, in recent years, the number of private hospitals has continued to grow at a rate of 50% per year, bringing pressure on inter-hospital competition [2]. One way to improve the quality of health services is to seek savings and improve service efficiency. The general methodology used for this is lean. Lean is a management philosophy that focuses on enhancing the process and elimination of waste to add value to customers [3]. The lean philosophy comes from Japan, in the form of Toyota Production System. After its success in improving the quality of production, lean was then adopted in an effort to improve the quality of service, including health care. Initial application experiences within the scope of health services provide promising results so lean becomes a philosophy as well as a methodology aimed at improving the quality of health services, including hospitals [4]. Currently, lean is the most widely used quality improvement methodology in the field of health services. A review by the UK National Audit Office in 2010 found that 51% of the publication of business process improvement methodologies use lean as a methodology and 35% of all lean users are the healthcare sector [5].

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This is due to the suitability between lean objectives and health services. Lean aims at customer satisfaction and employee engagement, similar to health services that want to achieve patient satisfaction by involving health workers. Result of the implementation generally has a significant impact on quality, cost, and time, and staff and customer satisfaction. The appearing outcomes include process reduction or waiting times, quality improvement through error reduction and cost reduction, while non-appearing outcomes reported include the increased of employee motivation and satisfaction, as well as the increase of customer satisfaction [6]. Andersen et al [7] identifies 23 key success factors of lean implementation in hospitals. Included in these key success factors are adaptability, measurement, overall approach, confidence, experience, administrative support, competence, communication, alignment, IT systems, system scope, continuous improvement, vision, customer focus, external support, resources, staff involvement, accurate data, doctors, working groups, training, supportive culture, and management. Given so many successful factors, it is difficult for a hospital to benefit from lean, if it loses one or more of these success factors. In this paper, reported a lean effort carried out in 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 VVIP rooms, 14 VIP rooms, 91 class I rooms, 123 class II rooms, 91 class III rooms, 11 ICUs, 4 HCUs and 45 TT Neonatal. We see that this hospital already has most of the terms of lean success. Doctors have good clinical leadership, while there is no problem in communication between patients and staff. Similarly, staffs appear to be engaged and committed to their work, while accurate records and systems are available to record various needs. We also find that lean is consistent with their strategic goals of Sisteres (Spirituality, Integrity, Stewardship, Trust, Excellence, Respect, Empathy, Systematic Thinking). We have also been training all staff on how lean is run and what the requirements for lean implementation to be successful. As long as lean is run, we get various administrative support to make it easier for the program and its assessment to be carried out.

2 METHOD

Yoseph I pavilion is one of two pavilions in Charitas Hospital to accommodate inpatients. Lean is 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, was to organize the Value Stream Mapping (VSM) of this pavilion, to identify existing wastes. Waste identification allowed the team to see what improvement opportunities can be made. After carrying out the VSM, the known wastes became the subject to the 5 S process, ended with standardization of work. We also set up a patient safety alert system, checklist for mandatory patient care, and oversee the production, preparation, and process of health care for inpatients. We arranged the interior design of the inpatient rooms in such a way that the flow of movement is not blocked and collided. For some things like file placement, we applied poka yoke (mistake proofing) in the form of a diagonal band, so there is no mistake in placing the file. On inventory issues, we continued to supervise so no items deemed to be useless or excessive are in a stockpile.

3 RESULTS

3.1 Inventory

In the early stages, we noticed an excess inventory in the medical equipment group; powder, lotion, and topical liquid; cream; and infusion. Half (50%) of powder, lotion, and topical liquid inventories. While cream and infusion were reduced by 53% and 46% respective, while for health equipment reduced by 37%. Overall, after the 5S process, inventories in January decreased 39% of inventories in December 2016. However, in February, we had to increase the amount of cream up to 100% due to huge need. As a result, the amount of cream was almost as it was in December 2016. However, we managed to reduce it again by 43% in March. Another unavoidable addition was the addition of powder, lotion, and topical liquid in March. Although it did not reach the initial conditions in December 2016, this increase was quite drastic compared to February 2017, which was 800%. 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

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Des	,399	10	,000	,654	10	,000
Jan	,397	10	,000	,648	10	,000
Feb	,391	10	,000	,661	10	,000
Mar	,400	10	,000	,663	10	,000

a. Lilliefors Significance Correction

Table 2 Wilcoxon Test Results on Baseline Inventory Data in Dec with Jan, Feb, and Mar

Test Statistics[a]

	Jan - Des	Feb - Des	Mar - Des
Z	-2,197[b]	-2,547[b]	-2,666[b]
Asymp. Sig. (2-tailed)	,028	,011	,008

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

Table 3 Progress of Yoseph 1 Pavilion Inventory

Description	Periode : 01-Dec-2016	Periode : 01-Jan-2017	Periode : 01-Feb-2017	Periode : 01-Mar-2017
Disposible	28.659.778	18.129.286	16.292.438	14.210.257
Powder, Lotion, Topical Liquid	211.266	105.633	17.605	158.449
Cream	778.800	363.440	726.880	415.360
Embalase	511.632	511.632	403.920	403.920
Infusion	13.902.869	7.441.733	8.104.472	8.269.334
Injection	466.443	468.744	467.593	216.466
Others	535.095	512.325	489.555	466.785
Spray, Inhaler, Nebules	44.490	44.490	44.490	44.490
Tablet	6.309	6.309	1.164	1.164
Total	45.323.484	27.782.122	26.639.112	24.260.676

As demonstrated in Table 2, the change occurs below 0.05 so it is significant. The difference between March and December is p = 0.008 which means very significant. When observing certain groups, there appears to be a considerable reduction. For example, medical devices have been reduced to half by March 2017, as well as in the cream group (47%), injection (54%), and tablets (82%). Infusion also decreased by 41%. All experienced reduction except for the unchanged group of spray, inhalers, and nebules because they have been at the optimum point. For further details, Table 3 is converted to graphic form as shown in Figures 1, 2, and 3. It appears that anomalies are found in topical cream and powder, lotion, and liquid inventories, while others group tend to decrease except for spray, inhaler and nebules, as well as tablet groups.

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

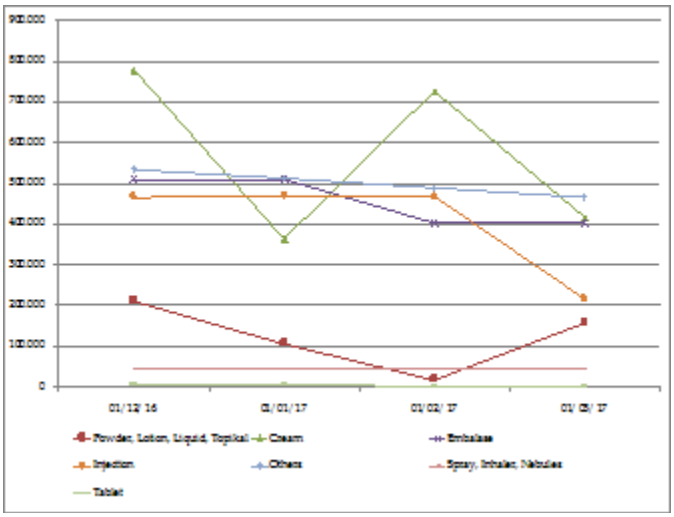

Figure 2 Changes in Inventories for Group with Value above IDR 1 million

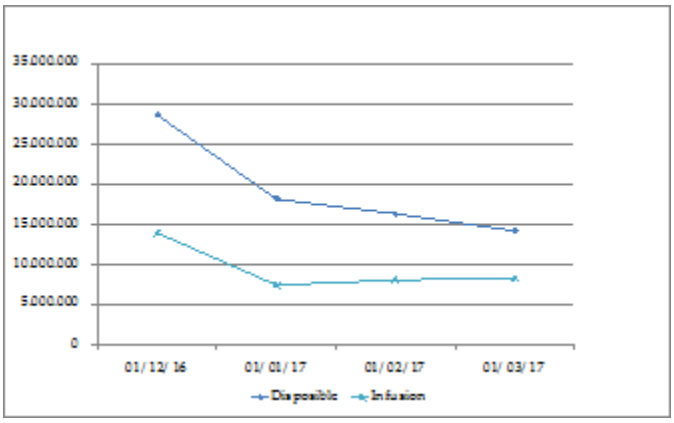

Figure 3 Overall Change in Inventory

In the patient's room, we observed that there was a waste of patient class typology. We observed patients in class I were divided into two classes, but one class was very unbalanced in the other. Class I is divided into class I and class I B. Patient class I consisted only by 32 people, while patients class I B was 103 people. We decided to remove class I patient and left only one class that is class I B. Meanwhile, in the class II, there were four classes of patients: Class II A, Class II B, Class II, and Class II Plus. Class II Plus was much less than the other class that only had 11 patients, while the other grade with the lowest number of patients was class II by 84 patients. We also removed class II, the next lowest class. We left the biggest class, class II A and class II B, for the class II. In the meantime, class III groups had only one type and was left alone. Therefore, the final class of patient rooms is class I B, class II A, class II B, and class III. For the number of inpatients, we found a large increase from December 2016. Increase in March to the December baseline was 12.90% of 37 patients per day in December 2016 into 41 patients per day in March. This increase can be seen in the monthly average patient progress chart per day. The following figure shows trends at monthly rates for overall, first-degree patients, level II patients, and third-level patients. If it is observed at a monthly rate, the level of certainty of linear growth reaches 93.3% for all patients, while for first-degree patients is 49.5%, second-level patients is 61.9%, and third-rate patients is 62.2%.

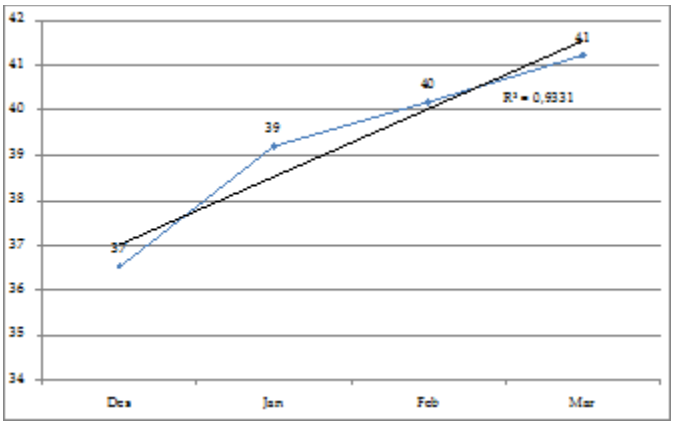

Figure 4 Growth of the Number of Monthly Inpatient

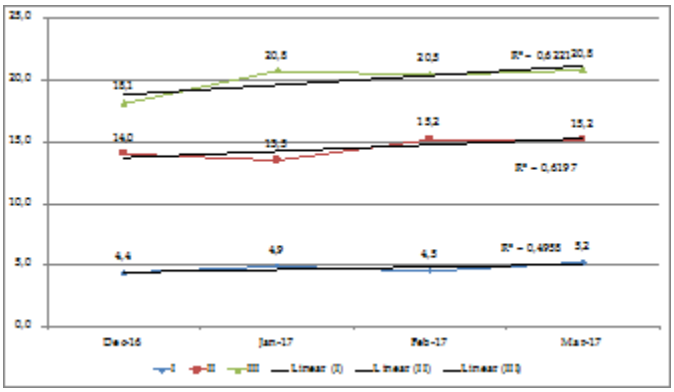

Figure 5 The Growth of Number of Monthly Inpatient in Three Classes

4 Conclusion

The above results indicates that lean implementations do manage to decrease inventory in certain items and overall items in hospitals. Similarly, lean assuredly increase the number of patient visits to inpatient installations either wholly or by patient class as well.

5. References

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