



Lean six sigma as a panacea to improve service quality in medical tourism

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Abstract

The healthcare delivery systems in India encounters significant waste in the form of long patient waits, unnecessary paperwork, duplicative diagnostic tests and shortage of supplies. Today, more than ever before, the pressure is increasing on international healthcare providers to provide high-quality care while improving efficiency and reducing cost which can be achieved by adopting Six Sigma. The study was carried out with the objective of making out a case for implementing Lean Six Sigma Methodology in hospitals marketing Medical tourism is a lucrative sector for many destination countries, particularly developing countries like India. In today's competitive environment, the main concern for medical tourism practitioners and managers is to identify ways and means for attracting new medical travelers through marketing and motivating them to make repeat purchases through service efforts and strategies. However, return of international patients to the hospital and destination country for medical treatment depends greatly on product and service quality experiences of patients during earlier treatment and less on International Accreditations. This paper presents a case study of the implementation of lean six sigma techniques through two projects carried out in a leading hospital promoting medical tourism in Kerala.

Keywords: medical tourism, healthcare quality, lean six sigma, process improvement

1. Introduction

Medical tourism has emerged as one of the fastest growing industry over the last few years. The low cost of treatments in countries like India, Malaysia, and Thailand have provided a boost to the Asian medical tourism sector. Medical tourism is international medical travel clubbed with leisure. Medical tourism is an emerging phenomenon where healthcare facilities are outsourced to third world country destinations from developed countries. Trends suggest that healthcare would continue to cross borders with increase in globalization and set new standards related to medical tourism. Recent studies reveal that the young, well-educated and insured western patients are traveling for medical treatment to destinations that give the best value for money.

2. Trends in Medical Tourism

Examination of recent trends in Medical Tourism to attract medical tourists and make India a destination of choice for international patients, it will have to go for value innovation in Medical Tourism and improve service quality. Thus, repeat visit and return of international patients to the hospitals in India for treatment is critical for success and sustainable competitive advantage. Studies indicate that keeping existing customers is about five times more profitable than attracting new customers. Increased customer retention will improve business profitability. However, return of international patients to the hospital and destination country for medical treatment depends greatly on product and service quality. Service quality promotes customer satisfaction, which in turn stimulates intention to return and encourage recommendations. Medical Tourism Index (2017) places India

in the 5th position in overall destination ranking in the world. However, India is ranked 1st and 3rd in Medical Tourism Industry and Quality of facilities & Services, respectively. However, India has not managed to come in the top 5 position as far as destination environment is concerned. What is heartening to note is that India has positioned itself among the leading destinations for medical tourism in the world. This shows that perception about India as a destination for medical tourism is good. See Table 1.

Table 1: 2016 – 2017 Top 5 Destination

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5
Over All Ranking	Canada	UK	Israel	Singapore	India
Destination Environment	Canada	UK	Singapore	Israel	Germany
Medical Tourism Industry	India	Colombia	Mexico	Canada	Dominican Republic
Quality of Facilities and Services	Israel	Germany	India	Canada	UK

Source: Medical Tourism Index, 2017

3. Process quality vs. International accreditation

An important reason for the growth of medical tourism in Asia is the improvement in the healthcare standards and available technology. Many hospitals in South East Asia, including Malaysia, Thailand and Singapore, have adopted and invested in the latest medical technology and provide state-of-the-art patient care. Quality of healthcare has become a focal point today. However, hospitals and health systems continue to

produce care that varies in quality. This has led to customer dissatisfaction as well as inefficient processes and output. As a result, hospital administrators and managers face uphill challenge to improve the quality of care in their hospitals. One quick way to address quality improvement issue adopted by most hospitals in Medical Tourism industry is getting international accreditation. Recent studies report that international accreditations such as Joint Commission International (JCI) and British Standards Institute and International Standards Organization (ISO designation) have become deciding factors when considering going abroad for medical care. There are many leading hospitals in India like Apollo Hospitals, Manipal Hospitals, Fortis Healthcare and Wockhardt Hospitals that have obtained accreditation by Joint Commission International (JCI). The National Accreditation Board for Hospitals (NABH) has also accredited many Hospitals in India. International Accreditations have helped in improving the public perception about these hospitals regarding quality, safety, efficiency, clinical services, etc. However, the International Accreditation System also has many weaknesses. Some of these weaknesses are as follows

- a) There is no universally accepted standard of who is qualified to call themselves “international accreditation organization”.
- b) There is no studies to show that accreditation provides sustainable improvement
- c) There is no study that shows improvement in efficiency and reduction in costs of healthcare services due to accreditation.
- d) Accreditation System does not change with market dynamics.

Accreditation Systems cannot effectively set right the significant amount of waste caused by flawed processes in the form of long patient waits, unnecessary paperwork, duplicative diagnostic tests and shortage of supplies in the healthcare delivery systems. Today, more than ever before, the pressure is increasing on international healthcare providers to provide high-quality care while improving efficiency and reducing cost which can be achieved by adopting Lean Six Sigma to achieve higher levels of process quality and reduce variance.

4. Objectives

- To study the implementation of a Lean Six Sigma process in healthcare sector.

5. Methodology of the study

The study analysed a Lean Six Sigma project under a number of headings: setting and context, approach, key success factors, benefits to hospital. The analysed project was then examined to identify patterns in the project. Secondary data was collected through various Books, Journals, Magazines, Government Reports and relevant Websites.

6. Review of literature

1. Lee Revere, Ken Black, Ahsan Huq (2004) [5]: “Examines Six Sigma as a strategy for improving service that tries to reduce defects and improves organizations marketing positions”. Concludes that the few healthcare institutions that have implemented Six Sigma have done so in the

interest of business and not so much in the area of patient care, where it is proposed that it will improve things dramatically.

2. John Connell (2006) [2]: “Examines the rise of medical tourism where tourism is deliberately linked to direct medical interventions and provides the first assessment of the emerging phenomenon of medical tourism”. Concludes that the trade in health services is expanding, becoming more competitive, and creating new dimensions of globalization, all elegantly packaged, and sometimes actually functioning, as the new niche of medical tourism.

7. Lean Six Sigma

“Lean” is a quality management program originating in the Toyota Corporation. Lean’s main philosophy is to concentrate time and effort on identifying and refining steps in an operation that the customer deems valuable, and to eliminate wasteful or unnecessary steps in a process (Lee, Olson, Lee, Hwang, & Shin 2007). The program relies heavily on the observation of processes by management, as well as the importance of clean and efficient work spaces. “Sigma” (Standard deviation, σ) is a measure of variation. Variation is present in all healthcare processes. A fundamental principle of process improvement is the measurement, reduction and control of variation. The output of a process will vary as it is repeatedly performed. Although customers of health care services may accept some variation, when variation is too extreme customers will be dissatisfied. The term “sigma” is used to designate the distribution or spread about the average (m) of any process or procedure. See Figure 1.

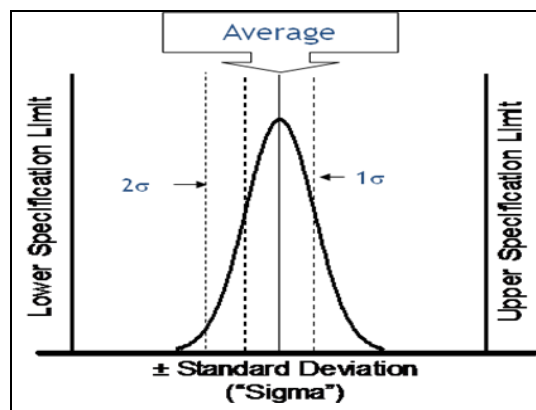


Fig 1

Sigma level indicates of how often a process is likely to meet objectives. Sigma level is often expressed as 2σ , 3σ , 4σ , 5σ and 6σ . A 6σ process will perform to specifications 99.999998% (i.e., no more than 3.4 defects per million opportunities - DPMO). Six Sigma addresses continued variation in hospital quality. It is a process for controlling that variation and continuously improving the product or service produced. The reason many of the initiatives that seek to reduce error are unsuccessful may be the focus on CQI/TQM programs. Although TQM encourages data collection and analysis, it is often not implemented so as to produce the level of detail required to understand process.

The primary goal of Six Sigma is to curb and eventually eliminate the number of defects that occur in a given process.

To achieve defect-free processes and reduce variation, Six Sigma creates a number of Six Sigma improvement projects. These projects are created through the use of the Six Sigma methodology, DMAIC (define, measure, analyze, improve, control) as explained below:

- **Define:** this step defines who the customers are, what the customers want, the process capabilities, and provides objectives for project-based improvement efforts.
- **Measure:** this step measures the quality characteristics that reflects improvement in customer satisfaction and product performance and provides the metrics of data on which the improvement efforts will be based.
- **Analyze:** in this step, data collected in previous steps are analyzed using analytical tools such as Pareto analysis, process flow diagram, fish-bone diagram, statistical process control charts, for identifying necessary design and process modifications for achieving customer satisfaction and performance objectives.
- **Improve:** in this step resources are allocated so that design and process modifications needed for improvement can be implemented.
- **Control:** in this step the process is monitored using quality management tools such as Pareto charts, and statistical process control charts to ensure that the performance improvements are maintained.

Six sigma health care projects in medical tourism examples

1. Reducing and optimizing the cycle time of patient discharge process.
2. Reducing medication errors.
3. Reducing error in lab work.
4. Improve Patient Flow.
5. Improve bed utilization.
6. Reducing medicine administration errors.
7. Increasing number of surgical operations per week.
8. Improving patient and relative feedback.
9. Reduction in lead time for preparation for therapy
10. Reduction in wait time for prescriptions
11. Increase daily prescription capacity at pharmacy.
12. Eliminating delay in pick-up service.
13. Improving guest expectation capturing processes.
14. Enhancing guest experience on key parameters.
15. Reducing errors in itinerary/visa process/tickets.
16. Improving guest feedback in tourism services.

8. Using Lean Six Sigma in Inventory Management – Case of a Kerala Hospital Promoting Medical Tourism

This section discusses a lean six sigma project that was

undertaken in a modern Super Specialty in Kerala. The 1000 bed hospital is also a teaching hospital and research center. It has an Ayurvedic Hospital in its campus. The hospital has uniquely positioned itself in such a way that one can have both modern medical facilities and also holistic medical facilities under the same roof. The hospital has been promoting medical tourism since 2006 and international patients from all over the world come there for medical treatment and alternative therapies. The Lean Six Sigma project was conducted in the hospital regarding inventory management in ward storeroom.

1. Setting and context: The storeroom of the hospital holds the common patient care supplies and special medical care supplies. At the beginning of the project a visit was made to the ward storeroom in the hospital. It was observed that it was highly disorganized with many items not in the expected places or where inaccessible when required. Many unnecessary items were also stored there. The location of the items was also not properly identifiable due to lack of clear marking. It was also observed that the work place, equipments, furniture surfaces, etc., lacked timely cleaning and dusting. All these anomalies were hampering expected level of services to the international patients directly or indirectly. The situation was found to be a fit case for implementing the 5S framework. The objective of a 5S exercise is to produce an end result of on-time-delivery of hospital supplies to the patients through the nursing and other staff of the hospital. 5S is a workplace organization method that uses a process checklist of five Japanese concepts:

- **Seiri (sort, organize):** No unnecessary items in work place. Clearly identified work areas and locations. Clear procedure to remove unnecessary items in place.
- **Seiton (strengthen, orderliness):** Clear location for instruments and equipments. All instruments and equipments easily available and accessible. All locations clearly marked and easily identified.
- **Seiso (shine, cleanliness):** Work areas, equipment, tools, desks and other horizontal surfaces clean. Cleaning materials available and accessible. All aisle markings, location indicators, etc., are clean and in order. Floors clean and free of debris
- **Seiketsu (standardize, adherence):** All necessary information visible. All standards known and visible. All visual displays current and up to date. There is adherence to existing standards
- **Shitsuke (sustain, self-discipline):** Procedures for maintaining 5s being followed sustaining the new order. An on-going audit and feedback system exist. A system exists to respond to audit feedback.

Table 2: Process Check List for Storeroom Evaluation

Name of the Work Area: Storeroom		Item score (0=no problem, 1=one to two problems, 2= more than two problems)	
		Before	After
Sort	Have all unnecessary items been removed?	2	0
	Are work areas, locations clearly identified?	2	0
	Does a procedure exist for removing unneeded items?	2	0
Straighten	Is there a place for all instruments and other equipment?	2	0
	Are all instruments and equipment in their place?	2	0
	Are locations clearly marked and easy to identify?	1	0

Shine	Are work areas, equipment, tools, desks and other horizontal surfaces clean and free of debris?	2	0
	Are cleaning materials available and accessible?	2	1
	Are all aisle markings, location indicators, etc., clean & unbroken?	1	0
	Are the floors clean and free of debris?	1	0
Standardize	Is all necessary information visible?	1	0
	Are all standards known and visible?	2	1
	Are all visual displays current and up to date?	1	0
	Is there adherence to existing standards?	2	1
Sustain	Are procedures for maintaining 5S being followed?	1	0
	Does an on-going audit and feedback system exist?	1	0
	Does a system exist to respond to audit feedback?	1	0
	TOTAL SCORE	26	3

2. **Approach:** The project was implemented over a period of three weeks by preparing a 5S process check list. A video was also made of the storeroom before the process was initiated and after process improvement changes were implemented to study the comparative positions.

- **Seiri Stage:** No close examination it was observed that there were many items that were lying in disuse in the storeroom and not being used in the ward. Therefore, the first step taken was to remove the items that were not necessary or fit for use. After unwanted items were moved out at the end of this stage, the storeroom contained significantly fewer items and unwanted clutter and disorder was removed.
- **Seiton stage:** In this stage the items were rearranged in the storeroom and relocated in correct places. Items that tended to be used frequently were put in quickly accessible position; items that were needed together were located together. At the end of this stage items in the store were rearranged in a convenient and logical order.
- **Seiso stage:** In this stage a new arrangement was put in place for timely cleaning of the storeroom and a register was introduced to be signed by the cleaning staff detailing the day and time of cleaning.
- **Seiketsu stage:** In this stage each category of items was labelled. Separators, signs and colour codes were used as per pre-determined standard format to keep the supplies organized. These standards signified the importance of the item to the ward and also ensured that the item would continue to be stored in its allocated place. The inventory in the store were determined by expected usage and then updated after monitoring for an extended period of time. This change enabled that the items relevant to the work of the ward were easily accessible, clean and presentable, and easily identified using visual standards.
- **Shitsuke stage:** In this stage a 5 S review meet between storeroom staff was introduced. This weekly meeting was introducing to ensure that the 5S project is sustained. This would establish ongoing communication within the ward and with the storeroom to replenishing the supplies.

3. **Key success factors:** Many steps were initiated to ensure a successful implementation of the 5S project. Firstly the stakeholders within the ward – nurse and supply attendants

– were trained for the project and introduced to the 5S framework. Secondly, the stakeholders within and outside the ward were kept continually briefed on the progress of the project. This strategy of regular communication and explanation was vital in getting all stakeholders within the ward and the staff in the hospital store on board. The store can now better control the frequency of supply and design the process for resupply. Also, the project was legitimized by the support of hospital management. The process check list before and after the implementation of 5S revealed a marked improvement in scores.

4. **Benefits to Hospital:** The project resulted in a storeroom that was clean, neat, appropriately stocked and fit for the purpose it was serving. The collaboration between storeroom, supply attendant and nurses assured patient supply. The supply storeroom could 5S its store space and inventory adjusting its organization and supply to floor usage. The impact was significant from a patient care delivery proposition to the inventory control and working capital proposition.

9. Conclusion

The proof that Six Sigma works is its financial impact on the bottom line. Sustaining Six Sigma takes commitment and leadership. The Healthcare delivery systems in India encounters significant waste in the form of long patient waits, unnecessary paperwork, duplicative diagnostic tests, shortage of supplies and poor work area management. There are numerous other areas where qualitative improvement is needed. Today, more than ever before the pressure is increasing on healthcare providers to provide high-quality care while improving efficiency and reducing cost. Lean Six Sigma is an effective tool to reduce such waste while improving quality and clinical care. To achieve customer retention and repeat visits by international patients, healthcare providers will have to improve their processes. Six Sigma tools can be adopted by big and small hospitals alike to initiate quality improvement projects and train their employees to conduct their own Lean Sigma initiatives. In today's globalized services marketing strategy, competitive advantage lies in service differentiation and delivering noticeable high quality service that results in satisfied customer.

10. Reference

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