

# Lean Healthcare Practice and Healthcare Performance in Malaysian Healthcare Industry

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**Abstract-** Recently, Malaysia healthcare industry has been continuously vigilant about healthcare system. The increase the number of medical schools showed that Malaysia is serious about providing quality healthcare. Healthcare system is faced with challenges and opportunities from a rapidly changing operating environment, including increasing expectations on the quality of healthcare. Hence, this paper attempts to review and proposed structural relationship model of lean healthcare practices (LHP) and a healthcare performance. A structural relationship model using Structural Equation Modeling (SEM) has been proposed. Based on the proposed conceptual model and reviewed, research hypotheses are being developed. The paper culminates with suggested future research work.

**Index Terms-** Lean healthcare practice, performance measurement, healthcare performance, healthcare industry

## I. INTRODUCTION

Healthcare in Malaysia is mainly under the responsibility of the government's Ministry of Health. Malaysia healthcare system is divided into two sectors consisting of both a government healthcare system and private healthcare system. Healthcare is one of the 12 National Key Economics Areas (NKEA) under the 10th Malaysia Plan (2011-2015). Contribution and investment in healthcare industry expected to help high income nation of year 2020 [1]. In addition, Malaysia has been continuously vigilant about effective healthcare system. The increase the number of medical schools is showed that Malaysia is serious about providing quality healthcare, not only to its citizens, but also to expatriates, tourists, migrants, and visitors.

Healthcare system is faced with challenges and opportunities from a rapidly changing operating environment, including increasing expectations on the quality of healthcare. Lean concept originally developed in the automotive industry to deliver high quality product and services while improving organizational performance and satisfying customers [2]. However, some organizations have begun adapting these concepts for the healthcare industry. Rexhepi and Shrestha [3] mentioned that there is need of lean in the healthcare sector. This is not only applicable in hospitals, but also in the private clinics or nursing home. Hagg *et al.*, [4] has been state that lean is an effective tool for identifying and eliminating waste from process. The benefit and goal of applying lean in healthcare is to best approach to reduce waste, as well as reducing wait times and unnecessary travel, while building quality, speed, and flexibility into the organization [2].

Therefore, if the Malaysia is serious about providing better quality in healthcare, they need to consider implement lean healthcare practice (LHP). So, the purpose of this paper are (1) to identify the LHP and HP measures for Malaysian Healthcare Industry and (2) to develop research model of the LHP and HP measures relationship for Malaysian Healthcare Industry. As a result, this research want to investigating what does LHP that are contribute to HP in Malaysian Healthcare Industry. In this research, there are four domain categories of LHP that are considered: LHP are Leadership (L), Employee Involvement (EI), Organizational Culture (OC) and Customer Focus (CF) while the three elements of HP: Financial Performance (FP), Customer Satisfaction (CS) and Employee Performance (EP).

## II. LITERATURE REVIEW

Figure 1 present the LHP framework which developed in this research. The framework proposes that LHP will have an impact on HP directly. LHP is conceptualized as a three-dimensional constructs as well as three performance outcomes (HP). Four dimensions for LHP are Leadership (L), Employee Involvement (EI), Organizational Culture (OC) and Customer Focus (CF) while three dimensions for HP are: Financial Performance (FP), Customer Satisfaction (CS) and Employee Performance (EP).

### *Lean Healthcare Practice*

Many healthcare organizations adopt the Toyota Production Systems as the practices and performance improvement that often called the Lean Healthcare management system [5]. Lean initiative does not focus on large scale investments, but it gives healthcare organizations an alternative methodology for achieving improvement without high investments [6]. Dahlgard *et al.*, [7] defines LHP is to develop hospital culture characterized by increased patient and other stakeholder satisfaction and everybody participate in identifying and reduce waste.

Leslie *et al.*, [2] defined LHP as a lean is a strategy focused on efficiencies and thereby allowing more time for patient care activities while Doss and Orr [8] has been state LHP as a process elimination waste in every area of operations for reducing inventory, cycle times and cost to delivering higher quality patient services. In addition, Poksinska *et al.*, [5] state that LHP is a system designed to provide the tools for people to continually improve their work and add value to the service they are deliver.

Meanwhile, the service organization such as healthcare industry, lean is applicable to organizations that have limited information and face interruption on task performance. This is because, the services encounter high costs with slow processes because of non value added activities, which lead to poor quality and low customer satisfaction [3].

Previously, there are several key factors that influencing the success of lean implementation. Identifying Critical Success Factors (CSFs) are very important in ensuring the successful of lean practice implementation and to avoid the failure risk such as will create lost to organization's cost, time and employee's effort [9]. Besides that, by identify the critical success factors, it can be ensure a positive outcome of the lean implementation in healthcare. Below are the summaries and construct factors influencing the successful implementing lean practices.

Table 1: The Summary for CSFs of Lean Practice Implementation

Authors	L	OC	EI	CF	CI
Harmon [10]			*		
Achanga [11]	*	*			
Doss and Orr [8]	*				
Kuo <i>et al.</i> [12]			*	*	
Vermaak [13]	*		*		
Kumar <i>et al.</i> [14]	*	*		*	
Hamid [9]	*	*	*	*	
Papadopoulos [15]					*
Folinas and Faruna [16]					*
Steed [17]	*				
Najem <i>et al.</i> , [18]	*	*			
Kundu and Manohar [19]	*	*			
Total	8	5	4	3	2

#### A. Leadership

According to Rexhepi and Shrestha [3] top management is the most important of the critical success factor of lean implementation. Implementation of lean is not possible without management support. Therefore, leadership is recognized as critical aspects for implementation of lean and other quality systems [18]. Referred to the previous studies, organization cannot succeed in lean unless it has healthy culture, skilled workers, the buy-in from the top management and strong leadership [18]. Angueloy *et al.*, [20] also found that the level of continuous leadership commitment to lean is a factor that considerably affected the outcome of lean practice.

#### B. Employee Involvement

Abdullah *et al.*, [21] emphasized that employee involvement is one of the important factor to drive the positive impact on quality improvement. This is because, employee behavior plays an important role on customer's perception of service quality [22]. Moreover, educate and empower staff is one of the process improvement in healthcare sector by involving all employee in the process. According to Harmon *et al.*, [10] high involvement works systems were associated with both greater employee satisfaction and lower patient service cost in 146 Veterans Health Administration centers. Besides that, increased in staff involvement were impact of increased job satisfaction, commitment, patient satisfaction and patient outcomes [23].

#### C. Organizational Culture

Managing organizational culture is increasingly viewed as an important part of healthcare reform [24]. Organizational culture is recognized as a critical aspect for implementation of lean and other quality systems [18]. According to Shahzad *et al.*, [25] a positive and strong culture can make an average individual perform and achieve brilliantly thus can impact on the employee's job performance. It also can improve in the productivity and enhance the organizational performance. Carney [26] identified that organizational culture influence to deliver quality of care. Thus, hospital with the best workplace cultures had the highest patient satisfaction and loyalty [27].

#### D. Customer Focus

More of the objective of any lean initiative is to focus on customer needs to the maximum level by identifying and ultimately eliminating the wastes [18]. The healthcare units recognized the patient as a primary customer and as a critical factor to be taken into consideration when designing process and delivering care [5, 25, 29, 30]. Furthermore, hospitals should provide higher quality health care services and give greater attention to patients by focusing always on their needs when implementing lean in hospital [3]. Studies show that orienting health care around the preferences and needs of patients has the potential to improve patients' satisfaction with their care, as well as their clinical outcomes. Thus, hospital that provide patient-centered care will have some of financial benefits such as lower cost per case, decrease adverse events, higher employee retention rates, reduced operating cost, decreased malpractice claims and increased market share [31].

#### Healthcare Performance

Performance measurement is instrument to promote the achievement of health system objectives [32]. According to the theory of quality management, the improvement initiatives have a significant positive correlation with performance [9]. According to previous study, an effective performance measurement will help to guide an organization to evaluate key process and effect positive change to improve care [33]. Outcome is useful to establish performance benchmarks, which identify the best performance in the industry and assessing the effectiveness, quality and value of healthcare service. In this paper, more focus on three performance construct such as Financial Performance (FP), Customer Satisfaction (CS) and Employee Performance (EP).

**A. Financial Performance**

Most of the healthcare industries aim to reduce cost while improving patient satisfaction and outcomes when implementing lean in healthcare. This is because unnecessary operational inefficiency can increase cost in healthcare. Koning *et al.*, [34] found in their study that implementing lean in healthcare can control healthcare cost increase. This is supported by Papadopoulos [15]; Rexhepi and Shrestha, [3]; Folinas and Faruna, [16] successful in implementing lean in healthcare can increase higher income and lower cost for organization. Therefore, financial performance is one important performance measurement in healthcare.

**B. Patient Satisfaction**

Patient satisfaction is an important factor for evaluating and improvement of healthcare service. Patient satisfaction is providing the evidentiary basis for measuring patient, clinicians and organizational outcomes [35]. Therefore, patient outcome is a major key of performance measurement in healthcare [35]. Besides that, patient's satisfaction from healthcare decides the healthcare delivery system and hence needs to be periodically measured to enhance the quality of service [36]. Thus, better outcome for patient usually imply more accessible care with shortened treatment time and waiting time [5].

**C. Employee Performance**

Lean initiative in healthcare can influence on employee and work environment. Therefore, employee can increase attention to waste and more productive attitude to problem solving [5]. Besides that, lean healthcare make staff are more receptive to patient demands [37]. Furthermore, employee can reduce stress and increased their morale by implementing lean in healthcare [3, 15].

**III. RESEARCH HYPOTHESES**

The lean healthcare practice framework developed in this study proposes that LHP has a direct impact on HP. Therefore, based on literature review and the research framework, the following hypotheses of the study have been developed:

H1: There is a positive and direct significant relationship between of LHP and HP in the Malaysian healthcare industry.

Lean service has shown great success in healthcare system [3]. Recent studies have explored the relationship between lean healthcare practice and healthcare performance. There are many studies proven that implementation lean in healthcare given positively result for healthcare performance. Study by Koning *et al.*, [34] found that lean can controlling healthcare cost increase, improving quality and providing better in healthcare. According to finding by Erfan [38] that applied the lean initiative in the healthcare sector in Libya had achieved significant improvement in the overall performance which allowed be more productive, flexible, smooth and with high quality service. From Institute of Healthcare Improvement, two healthcare organizations in the US showed positive impact on productivity, cost, quality and timely delivery of services after applied lean through organization [39]. Table 2 showed the benefits of LHP in healthcare industry.

Table 2: Benefits of Lean Practice in Healthcare Industry

Authors	Hospital	Benefits
Papadopoulos [3]	Pathology Unit of NHSCO hospital in UK NHS	<ul style="list-style-type: none"> <li>• Improvements in turnaround times for all specimens inpatients, outpatients and doctors</li> <li>• Staff morale</li> <li>• Lower costs</li> <li>• Help in quicker clinical decisions</li> <li>• More efficient patient care</li> </ul>
Rexhepi and Shrestha [15]	Rheumatology Department in University Clinical Center Of Kosovo.	<ul style="list-style-type: none"> <li>• Reduced waiting times</li> <li>• Reduced stress for employees</li> <li>• Increased patient satisfaction</li> <li>• Higher income for organizations</li> </ul>
Folinas and Faruna [16]	Three major hospital in the Federal Capital Territory, Abuja and Nigeria	<ul style="list-style-type: none"> <li>• Stoppage of unnecessary movement within the hospital</li> <li>• Reduced waiting time</li> <li>• Increased patient satisfaction</li> <li>• Reduced the cost</li> <li>• Striving to perfection for flow of service by eliminating wastes</li> </ul>

**IV. RESEARCH METHODOLOGY**

In this study, sampling method by using structured questionnaire. The population of this study comprised in Malaysian Healthcare Industry. Questionnaires will distribute to manager in Malaysian Healthcare Industry. To analyze the data, two statistical techniques were adopted. Structural Equation Modeling (SEM) techniques were utilized to perform the required statistical analysis of the data from the survey. Exploratory factor analysis, reliability analysis and confirmatory factor analysis to test for construct validity, reliability, and measurements loading were performed. Having analyzed the measurement model, the structural model was then tested and confirmed. The statistical Package for the Social Sciences (SPSS) version 17 was used to analyze the preliminary data and provide descriptive analyses about thesis sample such as means, standard deviations, and frequencies. SEM using AMOS 6.0 will use to test the measurement model.

**V. A PROPOSED RESEARCH MODEL**

Based on the literature review, many previous studies were explored LHP, and HP. The research aims at analyzing of the relationship between LHP and HP for Malaysian Healthcare Industries. This model is called proposed research model as presented in Figure 1.

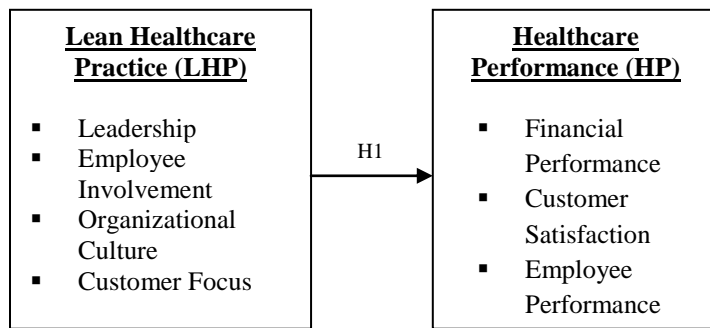


Figure 1: Research Model

## V1 CONCLUSION AND FUTURE RESEARCH

LHP has become most important for HP. Previous studies have been performed to identify critical success factors for successful implementation of lean. However, limited empirical study tried to investigate the relationship between LHP and HP especially in Malaysian Healthcare industries. Based on proposed model and a previous study, research hypotheses are being developed. The next step of this study is to design a questionnaire, which will be used for pilot study data collection in Healthcare Industries in Malaysia. Hopefully in future research agenda, the findings study can be benefited, used and contribute not only to academic but also to the industry, especially to the Malaysian Healthcare industries.

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