TRI-DIMENSIONAL RELATIONSHIP BETWEEN LEAN, PERCEIVED SERVICE QUALITY AND PATIENT SATISFACTION IN PUBLIC LEAN HOSPITALS, MALAYSIA

ANNIE NG CHENG SAN

UNIVERSITI PENDIDIKAN SULTAN IDRIS

2023

TRI-DIMENSIONAL RELATIONSHIP BETWEEN LEAN, PERCEIVED SERVICE QUALITY AND PATIENT SATISFACTION IN PUBLIC LEAN HOSPITALS, MALAYSIA

ANNIE NG CHENG SAN

05-4506832 pustaka.upsi.edu.my Perpustakaan Tuanku Bainun Kampus Sultan Abdul Jalil Shah PustakaTBainun ptbupsi

THESIS PRESENTED TO QUALIFY FOR A DOCTOR OF PHILOSOPHY

FACULTY OF MANAGEMENT AND ECONOMICS
UNIVERSITI PENDIDIKAN SULTAN IDRIS

2023

05-4506832 pustaka.upsi.edu.my Perpustakaan Tuanku Bainun Kampus Sultan Abdul Jalil Shah PustakaTBainun ptbupsi

UNIVERSITI PENDIDIKAN SULTAN IDRIS
SULTAN IDRIS EDUCATION UNIVERSITY

Please tick (√)	
Project Paper	
Masters by Research	
Masters by Mix Mode	
Ph.D.	√

INSTITUTE OF GRADUATE STUDIES

DECLARATION OF ORIGINAL WORK

This declaration is made on the **16 May 2023**

i. Student's Declaration:

I, ANNIE NG CHENG SAN, P20151000034, AND FACULTY OF MANAGEMENT AND ECONOMICS hereby declare that the thesis for Doctor of Philosophy titled Tri-dimensional Relationship Between Lean, Perceived Service Quality and Patient Satisfaction in Public Lean Hospitals, Malaysia is my original work. I have not plagiarised from any other scholar's work and any sources that contains copyright had been cited properly for the permitted meanings. Any quotations, excerpt, reference or re-publication from or any works that has copyright had been clearly and well cited.

_____
Signature of the student

ii. Supervisor's Declaration:

I, DR MAD ITHNIN BIN SALLEH hereby certify that the work entitled TRI-DIMENSIONAL RELATIONSHIP BETWEEN LEAN, PERCEIVED SERVICE QUALITY AND PATIENT SATISFACTION IN PUBLIC LEAN HOSPITALS, MALAYSIA was prepared by the above named student, and was submitted to the Institute of Graduate Studies as a full fulfillment for the conferment of DOCTOR OF PHILOSOPHY (BUSINESS MANAGEMENT) and the aforementioned work, to the best of my knowledge, is the said student's work.

16 May 2023
Date

_____
Signature of the Supervisor

UPSI/IPS-3/BO 31
Pind.: 00 m/s: 1/1

INSTITUT PENGAJIAN SISWAZAH /
INSTITUTE OF GRADUATE STUDIES

BORANG PENGESAHAN PENYERAHAN TESIS/DISERTASI/LAPORAN KERTAS PROJEK
DECLARATION OF THESIS/DISSERTATION/PROJECT PAPER FORM

Tajuk / *Title*: Tri-dimensional Relationship Between Lean, Perceived Service Quality and Lean in Public Lean Hospitals, Malaysia

No. Matrik /*Matric's No.*: P2015100034

Saya / *I* : Annie Ng Cheng San

(Nama pelajar / *Student's Name*)

mengaku membenarkan Tesis/Disertasi/Laporan Kertas Projek (Doktor Falsafah/Sarjana)* ini disimpan di Universiti Pendidikan Sultan Idris (Perpustakaan Tuanku Bainun) dengan syarat-syarat kegunaan seperti berikut:-
acknowledged that Universiti Pendidikan Sultan Idris (Tuanku Bainun Library) reserves the right as follows:-

1. Tesis/Disertasi/Laporan Kertas Projek ini adalah hak milik UPSI.
   The thesis is the property of Universiti Pendidikan Sultan Idris
2. Perpustakaan Tuanku Bainun dibenarkan membuat salinan untuk tujuan rujukan sahaja.
   Tuanku Bainun Library has the right to make copies for the purpose of research only.
3. Perpustakaan dibenarkan membuat salinan Tesis/Disertasi ini sebagai bahan pertukaran antara Institusi Pengajian Tinggi.
   The Library has the right to make copies of the thesis for academic exchange.
4. Perpustakaan tidak dibenarkan membuat penjualan salinan Tesis/Disertasi ini bagi kategori **TIDAK TERHAD**.
   The Library are not allowed to make any profit for 'Open Access' Thesis/Dissertation.
5. Sila tandakan (√) bagi pilihan kategori di bawah / *Please tick (√) for category below:-*

☐	**SULIT/*CONFIDENTIAL***	Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub dalam Akta Rahsia Rasmi 1972. / *Contains confidential information under the Official Secret Act 1972*
☐	**TERHAD/*RESTRICTED***	Mengandungi maklumat terhad yang telah ditentukan oleh organisasi/badan di mana penyelidikan ini dijalankan. / *Contains restricted information as specified by the organization where research was done.*
☑	**TIDAK TERHAD / *OPEN ACCESS***	

(Tandatangan Pelajar/ Signature)

Tarikh: 16 May 2023

(Tandatangan Penyelia / *Signature of Supervisor*)
& (Nama & Cop Rasmi / *Name & Official Stamp*)

Catatan: Jika Tesis/Disertasi ini **SULIT** @ **TERHAD**, sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali sebab dan tempoh laporan ini perlu dikelaskan sebagai **SULIT** dan **TERHAD**.

Notes: If the thesis is CONFIDENTAL or RESTRICTED, please attach with the letter from the organization with period and reasons for confidentiality or restriction.

APPRECIATION

The most difficult thing was always finding a balance between family, work and PhD. Finally, I did it. Without the help and support of those around me, I would not have gotten to point. First and foremost, I would like to express my sincere gratitude to my supervisor, Dr Mad Ithnin bin Salleh for his patients, guidance, understanding and professional expertise that he has provided. He always gives me positive encouragements and supports throughout the process. I also like to express my appreciation to all the examiners, Professor Dr Rushami Zien Yusof, Professor Dr Khairul Anuar bin Mohd Ali, Dr Nurul Fadly bin Habidin and Dr Nor Azrin bin Md Latip, researchers, healthcare experts, and participants for their valuable feedback and recommendations. Without their supports, this thesis would not have been possible as presented here.

With my sincere appreciation, I dedicate this project to my lovely parents, Ng Hung Wah and Liam Mei Lan, my brother as well as my family and most importantly my husband, Choy Johnn Yee and my beloved daughter, Serene Choy Hsin Eun. Thousand thanks for your loves, relentlessly supports, to inspire me and always being by my side whenever I faced challenges. I love you all.

Finally, I want to thank myself for having the courage to believe in dreams and making the impossible attainable.

ABSTRACT

The aim of the study is to examine the tri-dimensional relationship between Lean, perceived service quality, and patient satisfaction in public Lean hospitals, in Malaysia. This study employs quantitative approach to collect feedback from 48 public Lean hospitals in Malaysia. Partial Least Square-Structural Equation Modeling was employed to investigate the proposed measurement model and structural model. The findings showed that overall synergic effects of Lean practices particularly in the Strategy and alignment, Behaviour and engagement, and Process management have significant and positive relationship with perceived service quality. Additionally, perceived service quality has been found to have significant and positive relationship with patient satisfaction. However, none of the Lean practices has a significant impact on patient satisfaction. Such weak direct relationship between Lean and patient satisfaction is due to the lack of mediating effect contribution. Hence, mediating analysis was conducted and confirmed that perceived service quality fully mediated the relationship between Lean and patient satisfaction. For the model's explanatory power, it indicates a large explanatory power where 94.3% variance from the proposed constructs of Lean and perceived service quality in explaining patient satisfaction and satisfactory explanatory power where 65.2% variance in explaining perceived service quality. In conclusion, the findings validate the Complementarity theory and the Sustainable Lean Iceberg Model and confirm the complementary effect among Lean practices toward perceived service quality and patient satisfaction. The implication of this study is to provide a clear direction and guide for practitioners and researchers in Lean Healthcare development. It is to ensure that Lean practices are implemented holistically in order to produce a complementary synergic effect that enhances healthcare service quality and patient satisfaction. Additionally, this study also provides managerial implication to hospitals, as they should enhance the service quality performance as Lean need perceived service quality to maximize their effect on patient satisfaction.

HUBUNGAN TIGA DIMENSI ANTARA LEAN, KUALITI PERKHIDMATAN YANG DIRASAI DAN KEPUASAN PESAKIT DI HOSPITAL LEAN, MALAYSIA

ABSTRAK

Kajian ini bertujuan untuk mengkaji hubungan antara Lean, kualiti perkhidmatan yang dirasai, dan kepuasan pesakit di hospital Lean awam, Malaysia. Pendekatan kuantitatif digunakan untuk mengumpul maklum balas daripada 48 hospital Lean awam di Malaysia. Permodelan Persamaan Struktur-Kuasa Dua Terkecil Separa digunakan untuk menyiasat model pengukuran dan model struktur yang dicadangkan. Dapatan kajian menunjukkan bahawa kesan gabungan keseluruhan amalan Lean khususnya Strategi dan penjajaran, Tingkah laku dan Keterlibatan dan pengurusan proses mempunyai hubungan yang positif dan signifikan dengan kualiti perkhidmatan yang dirasai. Selain itu, kualiti perkhidmatan didapati mempunyai pengaruh yang signifikan dan positif terhadap kepuasan pesakit. Walau bagaimanapun, daripada amalan Lean yang dicadangkan, tiada amalan Lean yang mempunyai kesan signifikan terhadap kepuasan pesakit. Hubungan langsung yang lemah antara Lean dan kepuasan pesakit adalah disebabkan kekurangan sumbangan kesan pengantara. Oleh itu, analisis pengantaraan telah dijalankan dan mengesahkan bahawa kualiti perkhidmatan yang dirasai menjadi pengantara sepenuhnya hubungan antara Lean dan kepuasan pesakit. Kuasa penerangan model menunjukkan kuasa penerangan yang tinggi iaitu varians sebanyak 94.3% daripada konstruk Lean dan kualiti perkhidmatan yang dirasai yang dicadangkan dalam menerangkan kepuasan pesakit serta kuasa penerangan yang memuaskan iaitu varians sebanyak 65.2% dalam menerangkan kualiti perkhidmatan. Sebagai kesimpulan, dapatan kajian mengesahkan teori Pelengkap dan Model Iceberg Lean Mampan serta kesan pelengkap dalam amalan Lean terhadap kualiti perkhidmatan yang dirasai dan kepuasan pesakit. Implikasi daripada kajian ini memberikan rujukan berharga kepada literatur dengan hala tuju dan panduan yang jelas kepada pengamal dan penyelidik dalm pembangunan Lean Healthcare. Ini adalah untuk memastikan amalan Lean dilaksanakan secara holistik bagi menghasilkan kesan sinergi pelengkap yang mengukuhkan kualiti perkhidmatan kesihatan dan kepuasan pesakit. Selain itu, kajian ini juga memberikan implikasi pengurusan kepada hospital supaya hospital meningkatkan prestasi kualiti perkidmatan kerana Lean memerlukan persepsi kualiti perkhidmatan untuk memaksimumkan kesannya terhadap kepuasan pesakit.

CONTENTS

CHAPTER 5 DATA ANALYSIS AND RESULTS

CHAPTER 6 DISCUSSIONS, IMPLICATIONS, RECOMMENDATION AND CONCLUSION

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ASSU	Assurance
AVE	Average Variance Extracted
BE	Behavior and engagement
CCA	Confirmatory composite analysis
CB-SEM	Co-variance based Structural Equation Modeling
Covid-19	Coronavirus disease 2019
EMP	Empathy
LD	Leadership
PLS-SEM	Partial Least Squares Structural Equation Modeling
PM	Process management
REL	Reliability
RESP	Responsiveness
RO	Research Objectives
RQ	Research Questions
SA	Strategy and alignment
SPSS	Statistical Packages for The Social Science
TANG	Tangible
TTT	Technology, tools and techniques
VIF	Variance Inflation Factor

CHAPTER 1

INTRODUCTION

Health is the most crucial prerequisite for the achievement of world and country goals (Lima, Dinis-Carvalho, Souza, Vieira, & Gonçalves, 2021). Therefore, high quality healthcare is utmost important to ensuring the people are far from risk and receive quality comprehensive care to achieved their desired health outcomes. The quality of healthcare service is a verified tool for ensuring the economic and social growth of a country. Chapter 1 briefly explains the research topic which begins by the background of study including the healthcare system in Malaysia and its importance towards the country. This is then followed by the problem statement on the current issues faced by Malaysian public healthcare systems together with the gaps raised by the deficiency of past studies. From that, it motives this study to propose with four research objectives and research questions to examine the tri-dimensional relationship of Lean, perceived service quality, and patient

satisfaction in Malaysian public Lean hospitals. The significance of study as well as the operational term is further explained in this chapter.

1.1 Background of the Study

Health is defined as the state of being complete physical and social well-being (World Health Organization, 2021). With Coronavirus disease 2019 (Covid-19) pandemic, the world including Malaysia has witnessed the public health crisis and has becoming more challenging with the rise of daily infection cases and movement restriction. It changes and poses unprecedented challenges to the healthcare industry. In year 2022, the total world death rate is 6.22 million and it has killed 35,499 Malaysian with total 3.43 million Covid-19 cases (World Health Organization, 2022). With the rising number of death and spread of Covid-19 cause higher number of attendances, it results in declining in the healthcare quality, and cause providing satisfied healthcare services has become crucial for all countries including Malaysia (Naeira, Kamyar, & Nazli, 2021). The Ministry of Health Malaysia is under increasing pressure from the public to generate improved healthcare quality that is valued and satisfied by the rakyat in order to achieve optimal health outcomes and nationwide good health status.

Good health is essential for better quality of life. It leads to a more fruitful and fulfilling existence filled with affluence. Healthcare is an important element of a country's sustainability that also helps in socio economic development. According to Kruk et al.

(2018), good healthcare service is to optimize the healthcare services to consistently deliver the services which meet the patient's expectation, where public can trust, value and confidence with. The healthcare industry is distinct, complicated, and diverse, with a high level of patient and practitioner's engagement (Vanichchinchai, 2023). Poor healthcare quality undermines public trust, hastens the deterioration of quality of life, and can even lead to death (Tan, Ojo, Cheah, & Ramayah, 2019; Angela, Robinson, & Stewart, 2017). Almost every healthcare organizations, policymakers, and government are now engaged in continuous quality efforts to identify, improve, and adopt innovated and effective patient care procedures.

In the latest Malaysia Budget 2023, the government allocated RM 36.1 billion allocation for the public healthcare sector to build the national resilience in the preparation of endemic phase for Covid-19 infections ("Budget 2023: Public health services capacity," 2022). With the increase financial and manpower allocation, Malaysia healthcare system aims to close the service delivery gaps to deliver quality healthcare service to protect the rakyat. Consequently, more hospitals and clinics will be built and upgrading and maintenance of hospital are needed in order to safeguard the nation's health. The Malaysia government urged the importance of Malaysians' well-being as one of the priority strategy thrusts in Malaysia's journey to transit into Covid-19 endemic. With the latest Health Expenditure Report 1997 – 2019 published by Ministry of Health Malaysia (2021b) revealed that the total health expenditure contributed 4.3% of gross domestic product. Although Malaysia government remains committed to improve the perceived service quality and delivery of healthcare outcomes with constantly increment of government

health expenditure, it is still below the World Health Organization's acceptable global and regional standard (Anand, 2021). In addition to increased healthcare expenditures, Malaysia government, policymakers and healthcare organization are under constant pressure to ensure that large healthcare spending provides value for money in the form of high quality healthcare services. The Ministry of Health Malaysia has made it a priority to maintain a constant commitment to high quality healthcare services.

1.1.1 Healthcare System in Malaysia

No country could survive without access to healthcare. To flourish as a developed nation, it is necessary to have a comprehensive, effective, and efficient health-care system with satisfied and high quality service together with continual development that prioritizes patient-centered treatment tailored to the requirements of the rakyat (Ministry of Health Malaysia, 2015). In Malaysia, healthcare system is based on dichotomous parallel system which divided into public and private healthcare. By on the latest statistics revealed from Ministry of Health Malaysia (2021a), there were 135 public hospitals and 202 private hospitals. Public healthcare is a government lead funded public sector and served by 45 percent of registered practitioners likes doctors and specialists. According to Malaysia Finance Mister, Mr Tengku Zafrul Aziz (as cited in Anand, 2021), 70% of rakyat attend on the public healthcare system. To deliver an affordable and quality healthcare, the network of public clinics and hospitals distributed relatively even to all districts. Public hospital provides basic medical treatment for the community with the nominal cost for Malaysian

citizens. Besides, Malaysia public healthcare system has recognized globally with its low-cost healthcare system that provides comprehensive and universal services to citizens (Ahmad, 2019). For private healthcare, it is regulated by Ministry of Health under the Private Healthcare Facilities and Service Act of 2006. It is designed to target the middle and upper middle classes who are affordable for higher medical fees. Despite the existence of a public and private healthcare system, the Ministry of Health Malaysia is the primary policymaker and regulatory authority responsible for ensuring that high quality healthcare services are delivered to the public.

1.1.2 Importance of Public Healthcare System

According to Mustaffa, Rahman, Habidin, Karim, and Ahmi (2021), public healthcare like hospital is a true based service industry. It provides healthcare services which are intangible, inseparable and accessible to all Malaysian with relatively low cost. In year 2020, there are 16,635,350 outpatients attended and 2,687,181 million of patients were admitted into public hospital (Ministry of Health Malaysia, 2021a). The increasing of life expectancy, lifestyle-related illness and higher demand for quality healthcare from Malaysian has posed a challenge to the Malaysia health system. With the strike of Covid-19 pandemic and the increasing number of senior citizens to reach 5.8 million of the population by year 2030, it has resulted that Malaysian seek for quality and affordable medical treatment from public healthcare. All these challenges are requesting the Malaysia government to investigate whether the current healthcare model in public hospital is

enough to handle the current and future health challenges of Malaysia. According to Babroudi, Sabri-Laghaie, and Ghoushchi (2021), people are calling for more innovative quality management to restructure clinical operations and improve the quality of healthcare services in order to deliver satisfied and desired services to the rakyat.

Quality management is a management revolution that focuses on incorporating new and inventive ways of thinking in order to improve the performance of healthcare services. Hence, Lean is introduced to Malaysia healthcare system to develop patient-centered care via identify the patients' needs, improving the work process, and eliminate waste to enhance the service quality and patients' satisfactions (Ministry of Health Malaysia, 2020b). The first implementation of Lean in hospital is at Hospital Sultan Ismail, Johor Bahru in October 2013. It was then expanded to Hospital Raja Perempuan Zainab II, Hospital Sultanah Nur Zahirah, Hospital Tengku Ampuan Afzan, Hospital Selayang, Hospital Tengku Ampuan Rahimah, Hospital Sultanah Aminah, and Hospital Sultan Ismail. Later, the Malaysian Ministry of Health opened the way for the government's goal to expand Lean implementation to public hospitals. To date, there are total 52 public Lean hospitals in Malaysia (Ministry of Health Malaysia, 2018a).

1.2 Problem Statement

Tan et al. (2019) highlighted that although healthcare practitioners and organisations provide a similar sort of clinical service, the quality of healthcare treatment, and service is not the same. Nevertheless, it has been established and recognised that poor healthcare service quality can lead to patient dissatisfaction (Babroudi et al., 2021). Kruk et al. (2018) further reported that poor quality of healthcare service resulted in hostile healthcare outcome, which lead to increase of world deaths of 8 million per year, wasted resources, unnecessary health suffering, and consequently lead to impair the public trust and confidence. The authors reported that one third of the patients complaints on the healthcare service received such as poor communication, long waiting time, disrespectul care, and low healthcare satisfaction. Correspondingly, Malaysia healthcare system is facing constantly challenges due to the rapid growth of aging population, emerges of new diseases such as Covid-19, and reduction of government funding on public services (Ministry of Health Malaysia, 2020b). Indeed, the ongoing challenge for Malaysia public healthcare is to ensure the quality service delivery to build patient-centered services which is equitable, affordable, and efficient healthcare. Nevertheless, Ministry of Health Malaysia (2020a) reported several complaints have been filed in the public hospital's service quality.

According to the latest report from Ministry of Health Malaysia (2020a), there are 7,663 complaints in total, with 45.9% of those complaints pertaining to patient management and 21.6% on the administrative management. Among the complaints, overcrowding is not recent issues faced in public hospitals. According to Noris, Indera,

Libasin, and Krishnan (2022), plenty of news often reported the issues of overcrowding in public hospitals such as Bernama (2019) and Zainul (2020). Patients want prompt and high quality healthcare treatment. In the latest Auditor General Report 2018 reported by National Audit Department Malaysia (2018), it showed that public hospital faced with an increase number of patients attendance to 95.6% which lead to congestion. With the high attendance of patients, public hospitals face perennial problem of long waiting time and heavy workload. This fact is evident in the average waiting time for doctor consultation in public hospital is 132.7 minutes (Ministry of Health Malaysia, 2018b). The root cause of such congestion is resulted by the non value added process which lead to inefficent of patient flow process. The overcrowding issue not only create pressure to medical practitioners and create discomfort of patients which may impair their satisfaction towards public healthcare system.

In addition, latest Auditor General Report 2019 published by National Audit Department Malaysia (2021) reported nearly half of the medical equipment in public hospitals were old and outdated with being used more than one decade (39.7% of medical equipment were used for 11 to 20 years and 16% were being used for 21 to 30 years). With the outdated equipment, long waiting time, limited facilities, Bavani and Priva (2014) found that medical treatment in public hospital does not meet patients' expectation. With all these service failure resulted that the poor are getting poor healthcare quality in public hospital. According to the Strategic Framework of the Medical Programme 2021- 2025 published by Ministry of Health Malaysia (2020c), hospital congestion, obsolete equipment, long waiting time, and patients complaints are all critical concerns that must be

addressed in order to improve patient satisfaction. All these poor quality in healthcare services increase patisfaction dissatisfaction and deter patients from using the healthcare servicse, which can lead to adverse outcome. The dissatisfaction resulting from poor quality of healthcare service is not caused by one or two weak factors, rather than it is implying that the overall healthcare system is underperforming (Kruk et al., 2018). As a result, the growing demand for better service quality to enhance patient satisfaction in public hospitals which has led the management and Ministry of Health to re-examine their strategy, operation flow and remove wasteful process.

Therefore, the need for innovative model and high quality services in the Malaysian health-care industry is growing (Tan et al., 2019). Quality management on continuous improvement has become an essential component that Malaysian government must be focused about in order to increase the patient satisfaction in public healthcare system. Subsequently, Lean Healthcare has emerged as a new secret weapon for the public hospitals, with the Ministry of Health aiming to implement Lean thinking into public hospitals to help them become more patient-centred, identify value and eliminate waste in service delivery in order to enhance patient satisfaction (Awang, Kamarruddin, & Zakaria, 2020). According to Mazzocato, Savage, Brommels, Aronsson, and Thor (2010), Lean is the most recent management concept to hit the healthcare industry.

Gupta, Sharma, and Sunder M (2016) further claimed that Lean literatures have undergone a significant transformation. It is no longer applicable to manufacturing industry but also in the service industry like healthcare industry. Lean service focuses on respect for

people and its engagement (Vanichchinchai, 2022) and received great interest in researchers and practitioners especially in healthcare. Yet, given the unique characteristic of service and the complexity of healthcare system, there is an argument of Lean adoption and implementation in healthcare service industry. In the recent past studies found that Lean helps the hospital and healthcare practitioners to redesign the work flow, eliminate the non-value added activities, prioritize the significant value, and result to enhance the healthcare's quality and increase patient satisfaction (Vanichchinchai, 2023; Aburayya, Alshurideh, Alawadhi, Alfarsi, Taryam, & Mubarak, 2020; Costa & Filho, 2016; Brandao de Souza, 2009).

Academically, numerous past studies proven that a successful of Lean can improve the service quality and satisfaction. For instance, the past findings from Vanichchinchai (2022), Aburayya et al. (2020), Centauri, Mazzocato, Villa, and Marsilio (2018), Li, Field, and Davis (2017), Hadid, Mansouri, and Gallear (2016), and Amin and Zahora Nashruddin (2013) opined that Lean serves as essential elements to cultivate service quality and satisfaction in healthcare setting. Lean is not only the solution to continuous quality improvement but also a way to improve the overall healthcare service quality aspect.

Nevertheless, recent researches of Matt, Arcidiacono, and Rauch (2018), Mararos, Lemstra, and Nwankwo (2016), and Poksinska, Fialkowska-Filipek, and Engström (2016) found that inconsistent empirical evidence supports the contribution of Lean in patient satisfaction and service quality. Abdallah and Alkhaldi (2019), Nawanir, Lim, Othman, and Adeleke (2018), and Shah and Ward (2007) further pointed that the confusing evidence

on the relationship between Lean, perceived service quality, and patient satisfaction might arise from the narrow focus on piecemeal adoption of Lean practice in the healthcare organization. As highlighted by Peimbert-García (2019), most of the studies have narrow samples and did not take into account the hospitals as a whole. Additionally, majority of past studies focus on single aspect of Lean practice and believes it can work alone and each of them can improve the quality management on their own (e.g. Tajudin & Habidin, 2020; Pearce, Pons, & Neitzert, 2018; Antony & Kumar, 2012). The assumption that individual Lean practice can contribute into quality improvement is misleading and does not hold true in practice (Abdallah & Alkhaldi, 2019; McIntosh, Sheppy, & Cohen, 2014).

Recent studies of Yu, Demirli, and Bhuiyan (2022) and Marsilio and Pisarra (2021) argued that the true value and genuine usefulness of Lean Healthcare in healthcare service quality and patient satisfaction can only be guarantee when the Lean is implemented as a complementary construct in a system. Likewise, the Complementarity theory and Sustainable Lean Iceberg model also contribute to the advancement of knowledge where the organizations, policy maker, practitioners, and researchers should formulate Lean practice as a whole bundle, instead of in isolation. Lean should be multiple facets. In the studies conducted by Nawanir et al. (2018) and Nawanir, Fernando, and Lim (2018) advised that Lean should be conceptualized as second order factor as all the Lean practices are mutually supportive and have complementary effects. All these researches and theories have unequivocally demonstrated how crucial it is to implement Lean as a holistic system. Both practitioners and literatures call for a comprehensive approach to the effective implementation of Lean Healthcare. But, research on confirmation on measuring the

complementarity Lean practices especially in healthcare is still in its infancy (Lima et al., 2021).

On the other hand, the past studies rarely investigated the tri-dimensional connection between Lean, perceived service quality, and patient satisfaction or they would solely related one variable to another. The inconsistent literatures still exist as to whether Lean can enhance service quality and patient satisfaction in particularly to public healthcare hospital in Malaysia, seeing its importance. In the past, Aburayya et al. (2020) have investigated the tri-dimensional relationship of Lean, service quality, and patient satisfaction. However, the study used the combination of six sigma methods and tools in constructing Lean practices and their focus was only on healthcare institution in Dubai, United Arab Emirates. Sommer and Blumenthal (2019) and Poksinska et al. (2016) also argued that little evidence supports the direct or indirect impact of Lean Healthcare which led to enhancement of patients' satisfaction.

Because of the narrow focus on piecemeal Lean adoption and inconsistent link between Lean and patient satisfaction found in past literatures such as Tlapa et al. (2020), Matt et al. (2018), Mararos et al. (2016), and Poksinska et al. (2016), resulting in limited evidences on the drivers and contribution of Lean implementation in healthcare setting. This further raises the question of whether Lean can improve the quality performance in healthcare setting. Aburayya et al. (2020) further pointed that this is because patients attend hospital is for quality service delivery rather than looking into the hospital quality system or management. The authors urged the patients' satisfaction is the direct contribution from

service quality and service quality mediates the relationship between Lean Healthcare and patients 'satisfaction. In other words, perceived service quality can be mediating variable between Lean and patient satisfaction.

Still, limited study examines the tri-dimensional relationship between the three constructs, in particularly to test the mediating effect of perceived service quality between the relationship of Lean and patient satisfaction in healthcare industry. To date, the direct and indirect relationship between Lean Healthcare, perceived service quality, and patient satisfaction is ambiguous. Thin conclusive findings among the tri-dimensional relationship between Lean, perceived service quality, and patient satisfaction show there is room to clarify these relationships to foster the Lean implementation in order to guarantee its contribution in healthcare setting.

According to Cadet and Sainfort (2023), healthcare service is intangible and indistinct. Therefore, ongoing debate often found in the service quality literature on the service quality dimension such as SERVQUAL, Gronroos' two dimensional of functional and technical quality, HEALTHQUAL, 5Q's model, healthcare service quality (SQ) model, HEALTHQUAL, HSQ, and HospitalQual. Among the proposed service quality model, studies of the five dimensional SERVQUAL model from Parasuraman, Zeithaml, and Berry (1988) are well documented, it is well acknowledged that SERVQUAL model is popular and received well recognition from the past literatures in various industry (Darzi, Islam, Khursheed, & Bhat, 2023). Vanichchinchai (2021a) went on to say that none of the proposed scale measures can compete with SERVQUAL because none have been used as

extensively as SERVQUAL model in the literatures. The SERVQUAL model is found to be a valid, reliable, and stable assessment tools for perceived service quality including the healthcare setting (e.g. Vanichchinchai, 2022; AlOmari, 2021; Al-Borie & Damanhouri, 2013; Yousapronpaiboon & Johnson, 2013; Butt & Run, 2010). SERVQUAL measures the perceived service quality with five main dimensions which are Reliability, Assurance, Tangible, Empathy, and Responsiveness.

Although several scales have been developed in evaluating the perceived service quality, there is no disagreement that the service quality dimension should be multidimensional constructs regardless the organizational setting. According to AlOmari (2021), the quality of healthcare services should be a second order construct. In addition, Nunkoo, Teeroovengadum, Thomas, and Leonard (2017) highlighted that future research should adopted the second order factor model in measuring the service quality dimension to capture more parsimonious dimension of service quality. This is further explained by Koufteros, Babbar, and Kaighobadi (2009) where the authors revealed that second order model aids in reducing the number of predictors that need to be evaluated in the structural model to provide more parsimonious and interpretable model to understand the service quality. Pollack (2009), Kang (2006), and Brady and Cronin (2001) also raise the consistent opinion which supported that comprehensive quality evaluation should be hierarchical and multi-dimension. Therefore, perceived service quality in this study is conceptualized as second order reflective constructs which consists of Reliability, Assurance, Tangible, Empathy, and Responsiveness to yield better fit to align the healthcare service quality evaluation.

In the view of proposed calls made by scholars, it is believed that through investigating the bundles of Lean practices in health care are different in their effects on service quality and patient satisfaction. The underlying basis of this study was based on Complementary theory and on the study of Sustainable Lean Iceberg model as well as Nunkoo et al. (2017) to conceptualized Lean and perceived service quality as second order factor model. Lean is measured by first order constructs of Strategy and alignment, Leadership, Behaviour and engagement, Process management, and Technology, tools and techniques. Perceived service quality is measured with the five first order constructs which are Reliability, Assurance, Tangible, Empathy, and Responsiveness to predict their influence on the patient's satisfaction in public hospital more comprehensively.

1.3 Research Objectives and Questions

In accordance to the problem statement and deficiencies of studies being discussed earlier, this study purports to respond and fulfill the following research objectives (RO) and research questions (RQ).

1.3.1 Research Objectives (RO)

The general research objective is to examine empirically the tri-dimensional relationships between Lean, perceived service quality and patient satisfaction in public Lean hospital, Malaysia. It is of interest to know whether these tri-dimensional relationships between Lean, perceived service quality and patient satisfaction still hold true.

More specific research objectives are introduced and proposed for this study as follows:

(1) To examine the relationship between Lean practices (Strategy and alignment, Leadership, Behaviour and engagement, Process management, and Technology, tools and techniques) towards the perceived service quality in public Lean hospitals, Malaysia.

(2) To examine the relationship between perceived service quality and patient's satisfaction in public Lean hospitals, Malaysia.

(3) To examine the relationship between Lean practices (Strategy and alignment, Leadership, Behaviour and engagement, Process management, and Technology, tools and techniques) and the patients' satisfaction in public Lean hospitals, Malaysia.

(4) To investigate the mediating role of perceived service quality between Lean and patients' satisfaction for public Lean hospitals, Malaysia.

1.3.2 Research Questions (RQ)

In accordance to the research objectives, the study addresses four RQs on the tri-dimensional relationship among Lean, perceived service quality and patient satisfaction. The research questions have been formed as follows:

(1) What is the relationship between Lean practices (Strategy and alignment, Leadership, Behaviour and engagement, Process management, and Technology, tools and techniques) and perceived service quality in public Lean hospitals, Malaysia?

(2) What is the relationship between perceived service quality relates significantly with the patient's satisfaction in public Lean hospitals, Malaysia?

(3) What is the relationship between Lean practices (Strategy and alignment, Leadership, Behaviour and engagement, Process management, and Technology, tools and techniques) and patients' satisfaction in public Lean hospitals, Malaysia?

(4) Does perceived service quality mediate the relationship between Lean practices and patients' satisfaction in public Lean hospitals, Malaysia?

1.4 Research Hypotheses

In order to understand the tri-dimensional relationship between Lean, perceived service quality, and patient satisfaction in public Lean hospitals, Malaysia, 14 sub-hypotheses derived from four main hypotheses are developed as follows:

H_1: Lean has a significant relationship with perceived service quality in public Lean hospitals, Malaysia.

H_{1a}: Strategy and alignment has significant relationship with perceived service quality in public Lean hospitals, Malaysia.

H_{1b}: Leadership has significant relationship with perceived service quality in public Lean hospitals, Malaysia.

H_{1c}: Behaviour and engagement has significant relationship with perceived service quality in public Lean hospitals, Malaysia.

H_{1d}: Process management has significant relationship with perceived service quality in public Lean hospitals, Malaysia.

H_{1e}: Technology, tools and techniques has significant relationship with perceived service quality in public Lean hospitals, Malaysia.

H_2: The perceived service quality has significant relationship with patient satisfaction in public Lean hospitals, Malaysia.

H_3: Lean has significant relationship with patient satisfaction in public Lean hospitals, Malaysia.

H_{3a}: Strategy and alignment has significant relationship with patient satisfaction in public Lean hospitals, Malaysia.

H_{3b}: Leadership has significant relationship with patient satisfaction in public Lean hospitals, Malaysia.

H_{3c}: Behaviour and engagement has significant relationship with patient satisfaction in public Lean hospitals, Malaysia.

H_{3d}: Process management has significant relationship with patient satisfaction in public Lean hospitals, Malaysia.

H_{3e}: Technology, tools and techniques has significant relationship with patient satisfaction in public Lean hospitals, Malaysia.

H_4: Perceived service quality mediated the relationship between Lean and patients' satisfaction in public Lean hospitals, Malaysia.

1.5 Proposed Conceptual Framework of Research

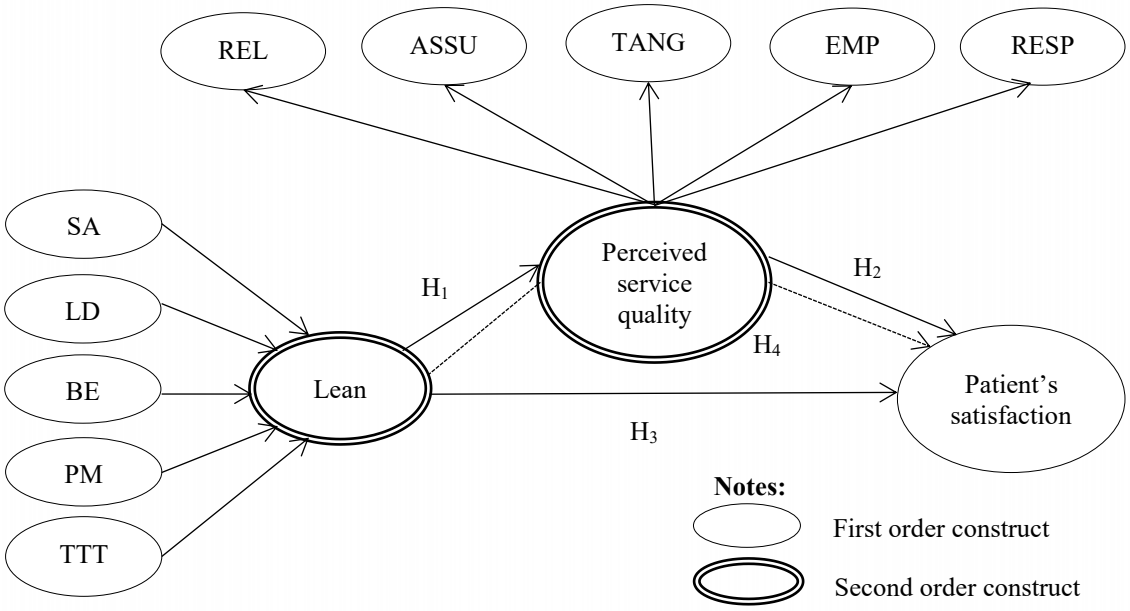
In this study, the formulation of the conceptual framework is inspired by the Complementarity theory, the Sustainable Lean Iceberg model, as well as the SERVQUAL five dimensional model. To achieve desired results in raising patient satisfaction in healthcare sector, Lean and perceived service quality are the leading driving forces influencing and developing the quality management theory with a focus on internal and external quality dimensions.

The Complementarity theory (Edgeworth, 1881) raised the ground of theory based where the combination of all Lean practices contributes the synergistic collective effect to lead the success Lean journey to improve the perceived service quality and patient satisfaction. It is believed that none of Lean practice can work alone and yield optimal result for continuous improvement. Similarly, the Sustainable Lean Iceberg model originated from Hines (2010) proposed that the effective Lean implementation should be take into consideration of the elements-above the waterline which are Technology, tools and techniques as well as Process management and elements-below the waterline namely, Strategy and alignment, Leadership, and Behaviour and engagement. The author urged the importance of applying the Lean practices simultaneously and holistically, rather than piecemeal adoption, for continuous improvement in all sectors. The Complementarity theory (Edgeworth, 1881) and the Sustainable Lean Iceberg model (Hines, 2010) serve as the benchmark and guideline to guide the practitioners, healthcare organization, and policymaker on how they should utilize all the Lean practices to improve the process

delivery for better continuous improvement in healthcare service quality and improving patient satisfaction.

In addition, the SERVQUAL model proposed by Parasuraman et al. (1988) adopted in this study to provide the overall measurement of perceived service quality to be evaluated in healthcare setting. The SERVQUAL dimension provide references to the healthcare practitioners, providers, and organizations on how to understand how the service process should maintain and measured in order meet the patients' expectation and needs. To ensure the quality of healthcare service, it is importance to capture and obtain the patient's assessment of how well healthcare service was given in order to meet patient's expectation. The overall perceived healthcare service quality therefore, included the five aspects of service quality elements of Reliability, Assurance, Tangible, Empathy, and Responsiveness.

Therefore, this study aims to investigate and explore the tri-dimensional link between Lean, perceived service quality and patient satisfaction in public Lean hospitals, Malaysia using the Complementarity theory, Sustainable Lean Iceberg model and SERVQUAL model to construct the conceptual foundation. The proposed conceptual framework in this study is presented as below Figure 1.1.



Note, SA= Strategy and alignment; LD= Leadership; BE= Behavior and engagement; PM= Process management; TTT= Technology, tools and techniques; REL= Reliability; ASSU= Assurance; TANG=Tangible; EMP= Empathy; RESP= Responsiveness

Figure 1.1. Proposed Conceptual Framework

1.6 Scope of Study

The scope of the study serves as a guideline and reference to provide better understanding on the discussion flow for the upcoming chapters.

This research is a quantitative and cross-sectional study which aims to investigate the tri-dimensional relationship between Lean, perceived service quality, and patient satisfaction as well as examine the contribution of mediate role of perceived service quality in the connection of Lean and patient satisfaction.

The proposed conceptual framework for this study is motivated by the Complementarity theory and The Sustainable Lean Iceberg Model where it is believed that no Lean practice can be implementing isolated. It should be ideal synergistic effect among all Lean practices to bring positive outcome. Therefore, Lean constructs, namely Strategy and alignment, Leadership, Behaviour and engagement, Process management, and Technology, tools and techniques are proposed in this study which consistent with suggestion from Leite, Bateman, and Radnor (2016) and Hine (2010). In addition, the constructs of perceived service quality are consistent with the SERVQUAL five dimensional model (Reliability, Assurance, Tangible, Empathy, and Responsiveness) originated by Parasuraman, et al. (1988) and modified by Vanichchinchai (2022) and Butt and Run (2010) for healthcare setting. The constructs of patient satisfaction in this study is consistent with Meesala and Paul (2016) and Andaleeb (2001).

This study adopted the self-administrated survey questionnaires as data collection tool to collect the feedback for public Lean hospitals, Malaysia on the three variables proposed. The items in survey questionnaires are adopted from the past literatures and later sent for expert validation for further input before pilot test is carried out.

The unit of analysis for this study focuses on the public Lean hospitals in Malaysia. The public Lean hospitals are captured from the statistic annual report published by Ministry of Health Malaysia (2018a) where there are total 52 public Lean hospitals in Malaysia.

1.7 Operational Terms

The key operational terms for this study are presented in the following section.

1.7.1 Lean

As defined by Assen (2018), Lean is a philosophy with collection of practices focusing quality, strengthening process flow and eliminating non-value added process to develop customer centered services through continuous improvement.

1.7.2 Lean Healthcare

Lean Healthcare is the application of the Lean thinking into healthcare environment to re-design the hospital work process and culture via continuous improvement in order to minimize waste, improve quality management with healthcare practitioners and employees' support to satisfy the patient (Marsilio, Pisarra, Rubio, & Shortell, 2022; Anuar, Saad, & Yusoff, 2017; Costa & Filho, 2016). In this study, Lean Healthcare viewed as philosophy with synergic effect of practices in continuous improvement process focusing on quality improvement to understand patients' needs, reducing waste, optimize

process flow with employment engagement and involvement to improve the healthcare service delivery to patients and aims patient satisfaction as the vital goal.

With the inspiration from Complementarity theory and the Sustainable Lean Iceberg Model, five first order constructs for Lean in this study are Strategy and alignment, Leadership, Behaviour and engagement, Process management, and Technology, tools and techniques (Hines, 2010).

1.7.2.1 Strategy and Alignment

Hines (2010) explained the Strategy and alignment as how well the Lean initiative, goals, strategy, and purpose is developed, aligned, communicated and explained to all people in the organization. Hence, this study defined Strategy and alignment as the formulated Lean objective and strategy that healthcare organization sets to develop the patient centered healthcare service delivery to guide the operational action of the organization and healthcare practitioners.

1.7.2.2 Leadership

Leadership is defined as how the leader provides guidance and communicates to employees to facilitate them in Lean implementation (Centauri et al., 2018). Similarly, this study

operationalized the Leadership as the process through which the healthcare leaders provide action guide to facilitate and support the Lean implementation.

1.7.2.3 Behaviour and Engagement

According to Leite, Bateman, and Radnor (2016), Behaviour and engagement refer to corporate culture, organizational engagement, individual's behavior, and human aspect development, which influence the implementation of Lean. In this study, Behaviour and engagement is focusing on how well healthcare organization develops a continuous improvement culture and human resource management to support and motivate practitioners' involvement, engagement and commitment for a shared Lean goal.

1.7.2.4 Process Management

According to Hines, Found, Griffiths, and Harrison (2008), Process management is focusing on the working process. This study further defined it as the way the healthcare organization plans, maps, visualizes, manages, and monitors the work flow process for long term management in order to deliver quality and efficient service to patient.

1.7.2.5 Technology, Tools and Techniques.

Technology, tools and techniques is defined by Grigg, Goodyer, and Frater (2020) as the selection of tools, technologies or techniques adopted in organization for Lean implementation. Consistently, Technology, tools and techniques in this study focus on the selection of Lean tools to assist the healthcare organization and practitioners to identify waste, reduce non-value added resource, to improve the operation efficiency, and patient flow.

1.7.3 Perceived Service Quality

Zeithaml (1987) explained that perceived service quality is about the customers' judgment on the overall service quality based on their perceptions of the service is received and what is given. Therefore, perceived service quality in this study is explained as patient's judgment on how well the healthcare services delivered in order to fulfill the patient' expectation (Verma, Kumar, & Sharma, 2022).

In addition, this study adopted the Parasuraman et al. (1988)'s SERVQUAL five dimensional model to measure the perceived service quality and they are Reliability, Assurance, Tangible, Empathy, and Responsiveness.

1.7.3.1 Reliability

For healthcare setting, Reliability as described by Wan Rashid and Jusoff (2009) on the process care in which, the healthcare practitioners able to perform promised healthcare service reliable and accurately. It involves of providing promised healthcare service on time, free of error, and flexible.

1.7.3.2 Assurance

Assurance is measured on the ability of healthcare practitioner to enhance the patients' trust and confidence (AlOmari, 2021; Akdere, Top, & Tekingündüz, 2018). In this study, Assurance is focusing on the knowledge, competence, and capability of the practitioners in providing safe healthcare services, which can be trusted by the patients.

1.7.3.3 Tangible

As described by Vanichchinchai (2022), Tangible measures the appearance of healthcare physical facilities, equipment as well as the appearance of the healthcare practitioner. When the environment is appealing, healthcare material is sufficient, and modern, together with clean and neat staff appearance, it brings positive outcome in overall perceived service quality evaluation (Verma et al., 2022).

1.7.3.4 Empathy

With the intangibility characteristic in healthcare service, the interpersonal interaction between patient and healthcare practitioners is crucial in the overall perceived service quality evaluation (Yousapronpaiboon & Johnson, 2013). In this study, Empathy defines the approachability and ease of healthcare practitioners contact in demonstrating care and individual attention to understand the patient's needs.

1.7.3.5 Responsiveness

Duggirala, Rajendran, and Anantharaman (2008) claimed that willingness and availability of offering quick service to assist customers is crucial elements for Responsiveness. Consistently, this study operationalized the Responsiveness as the willingness of practitioners to help the patients and provide prompt service with clear and sincere instruction.

1.7.4 Patient Satisfaction

Patient satisfaction, as defined by Chahal and Mehta (2013), is the crucial indicator of healthcare quality. It occurs when the expected and actual service performance are

perceived differently. Therefore, this study operationalized the patient satisfaction as the outcome from patient judgment towards the healthcare service and system that received by them. Patients are satisfied with the healthcare service quality when they perceived the service is exceeding their expectation.

1.7.5 Healthcare Practitioners

According to Vanichchinchai (2021), healthcare practitioners also refer as the care providers in the healthcare sectors. They are the doctors, nurses, pharmacists, management and employees in the respective healthcare organizations. Liker and Hoseus (2008) further highlighted that healthcare practitioners are the members of Lean transformation journey, they are well equipped with the relevant information of the public Lean hospital practices with regards to the quality management. Additionally, Lee (2017) pointed that the patients' needs may be met when the healthcare practitioners acknowledge it, recognized their value and implement quality improvement strategy to enhance it. The healthcare practitioners in this study, therefore refers to the doctors, specialists, nurses, consultants, and pharmacists who play an important role in interact and dealing with patients throughout the delivery of healthcare services.

1.7.6 Public Lean Hospitals

Public Lean hospitals refer to those public hospitals which have implemented Lean Healthcare in Malaysia.

1.8 Limitations of Study

Several limitations are discovered in this research. The scope of this study is limited to public Lean hospitals in Malaysia, which results in the first limitation discovered. Such limitation may result in the generalization of findings should be proceed with caution. Next, the selection of cross-sectional approach in collecting data for understanding the tri-dimensional relationship in Lean, perceived service quality and satisfaction among patients is the second limitation found in this study. It limits in providing comprehensive view on full understanding of how these constructs and its relationship evolve through time. In addition, the focus on this study is entirely on the tri-dimensional relationship between the three constructs as well as the mediating role of perceived service quality in the connection among Lean and patient's satisfaction. It limits the contribution of other moderating factor which can in place to strengthen the relationship.

Nevertheless, all these limitations might be considered as the areas for further development, improvement, and opportunities for future researches to reinforce the

relationship of Lean, perceived service quality, and satisfaction among patient in healthcare setting.

1.9 Significances of Study

Considering this study, the findings of this research could contribute significantly to practical and theoretical implication. The contributions into both practical and theoretical implication are further elaborate in the following subsections.

1.9.1 Practical Implications

Since Ministry of Health Malaysia is pushing for quality healthcare system, it is truly important for Lean hospitals to continue improve to develop a patient centered healthcare delivery which provide equitable, affordable, efficient, and effective healthcare services to rakyat. In healthcare industry, the services delivered are intangible and any quality issues and failure to meet the patients' expectation will induce complaints and dissatisfactions. Sharma (2017) points out that patient satisfaction can only be enhanced by being responsive to the patients' expectation and needs via continuous improvement in the healthcare service quality and system. This is further supported by Bahadori, Teymourzadeh, Bagejan, Ravangard, Raadababi, and Hosseini (2018). The authors claim that it is critical to recognize the cause and effect relationship among the quality

management and service quality for continuous measurement of healthcare service in order to improve the clinical service performance as this is the crucial steps in increasing the healthcare service satisfaction. Therefore, evaluation of the healthcare quality management such as the perceived service quality and Lean has become the major concern of Ministry of Health Malaysia, practitioners and healthcare organizations.

Understanding the perception from target participants for public Lean hospitals, it leads to provide meaningful reference and feedback for the healthcare organization, practitioners and policymakers on the current healthcare outcome status. In addition, the policymakers can understand the complementary effect of the Lean practices with valuable indications on the significant practices which are relevant when implementing the Lean Healthcare to ensure its sustainability and effect towards patient satisfaction and healthcare service quality.

The success of Lean implementation often associates with awareness and Lean knowledge among the people in the healthcare organization. Consequently, this study mainly contributes in creating awareness and knowledge to the healthcare practitioners and organization on the importance of Lean Healthcare and facilitates them in Lean implementation. If the healthcare practitioners are not aware and understand the significant importance of Lean in enhancing the healthcare service quality and patient satisfaction, the overall target and effort of Ministry of Health Malaysia in developing quality healthcare system in vain.

In addition, this study mainly contributes to Malaysian healthcare system that purport to nurture patient-centered quality healthcare environment, so that the policymakers and practitioners will be able to see a clearer picture of the relationship between Lean, perceived service quality and patient's satisfaction. Practically, it could provide significant insight to the healthcare practitioners and policymakers to the overall Lean Healthcare enhancement that subsequently foster the perceived service quality and patient's satisfaction.

Undoubtedly, the implementation of Lean is costly. Despite the lofty goals of Lean proponents, the evidence that supporting its role in improving healthcare service quality and patient satisfaction is surprisingly scarce. As a result, some have questioned the role of Lean practices in improving the healthcare service processes (Mararos et al., 2016; McIntosh et al., 2014; Kaplan, Patterson, Ching, & Blackmore, 2014; Radnor, Holweg, & Waring, 2012; Näslund, 2008). To ensure its success in healthcare setting, the findings of this study could serve as a guideline to practitioners and policymaker to determine the synergic effect of Lean in promoting quality healthcare service, which bring positive contribution to perceived service quality and patient satisfaction.

1.9.2 Theoretical Implications

Although study on patient satisfaction in Malaysian hospitals has been much explored, and Lean is claimed as the contributor to perceived service quality as well as patient

satisfaction, the past empirical studies scarcely focused on the tri-dimensional connection between Lean, perceived service quality, and patient satisfaction and provide empirical evidence to support this notion. In addition, limited studies noticed and examined the mediating role of perceived service quality in the relationship between Lean and patients' satisfaction. Strictly speaking, past studies examined on this tri-dimensional relationship between these three variables are limited. In Malaysian healthcare perspective, questions posted on whether Lean can affect the perceived service quality and patient satisfaction and whether perceived service quality can mediate Lean and patient satisfaction, are still yet to be concluded.

To fill this literature gap, the ultimate goal of this study is to explore the tri-dimensional relationship between Lean, perceived service quality, and patient satisfaction. Therefore, the proposed conceptual framework of this study aims to enrich the current state of literature on explaining the relationship between the three variables and provides valuable insight for future research. With the proposed conceptual framework and 14 hypotheses (were further discussed in Chapter 3) formulated, it aims to provide comprehensive understanding on how these three variables are connected directly or indirectly. The mediating variable, perceived service quality will hopefully serve as a significant intervener to enhance the relationship between Lean and patient satisfaction and at last enrich the healthcare body of literature.

In addition, the proposed conceptual model serves as the driving force for practitioners and future researchers to further analyses the Sustainable Lean Iceberg Model

and perceived service quality which has yet to be scrutinized, on patients' satisfaction. Significantly, the association of the three constructs are elucidated, thus develop most effective quality management that create high quality of healthcare system in order to improve the well-being of people in Malaysia. Consequently, the proposed conceptual framework is deemed significant to be analyzed on the Malaysian healthcare setting.

1.10 Organization of Study

The overall structure of thesis takes the forms of six chapters. The first chapter, Chapter 1 begins with explanation and elaboration of the research background of healthcare and public hospital in Malaysia and the current challenges faced by the public healthcare as well as the deficiency of past studies in Lean, perceived service quality and patient satisfaction. In accordance with problem statement and literature gaps, four ROs together with four RQs were proposed. In addition, four main hypotheses with total 14 sub-hypotheses were developed. The scope of study and definition of the operational terms used in this study were explained. Following, Chapter 1 was concluded with the significant of this study in practical and theoretical implications and organization of study.

Chapter 2, it discusses about the concept of Lean thinking, perceived service quality, and patient satisfaction in the past literatures. It begins with the presentation of Lean thinking, its evolution into Lean service and the application of Lean in various industries including healthcare as well as the successful stories of Lean Healthcare in

Malaysia. It then followed by the discussion of literatures relating to the underlying theory and model employed in this study which are Complementarity theory and the Sustainable Lean Iceberg Model. The five first order constructs of Lean adopted are illustrated in this Chapter 2. Furthermore, a review of the second variable which is the mediating variable of perceived service quality, follow with the five first order measurements was presented. In addition, the deficiency of literature and methodology of Lean Healthcare and perceived service quality was further discussed in this chapter. Lastly, the discussion on patient satisfaction was explained in this Chapter 2.

From the review of literatures, four main research hypotheses were developed as well as the conceptual model was presented in Chapter 3 to explain the tri-dimensional relationship between Lean, perceived service quality and patient satisfaction in public Lean hospitals.

Following that, Chapter 4 is concerned with the research design and methodology for this study. It includes the description of the research design for this study, followed by instrument development, sampling technique particularly the data collection method, feedback from expert validation, result of pilot study as well as data analysis method used to analyze the findings of this study.

Chapter 5 presents the empirical findings from statistical analysis to explain the connection between Lean, perceived service quality and patient's satisfaction. It begins with the discussion in treatment of missing data, demographic information of targeted

healthcare practitioners and patients and the preliminary analysis. Subsequently, measurement model and structural model assessment were conducted with Partial Least Squares Structural Equation Modeling (PLS-SEM) through Smart-PLS 3.0 to understand the relationship between Lean, perceived service quality and patient satisfaction.

Chapter 6 would interpret the findings from the statistical analysis. In addition, a detail discussion based on the empirical findings of the tri-dimensional relationship between the Lean, perceived service quality and patient satisfaction was presented in this chapter. In parallel, the limitations of study as well as future recommendations were explained in this chapter. Chapter 6 was then concluded with final summary to conclude the major findings in accordance with the RQs to safeguard that the ROs proposed for this study are fulfill.

1.11 Chapter Summary

In this chapter, the background and importance role of healthcare system towards a country is introduced. It is followed with the discussion of the challenges and current issues faced by Malaysian public healthcare system on the service quality delivery and poor satisfaction. To solve this, the Lean Healthcare implementation was introduced by Ministry of Health Malaysia with aim to develop patient centered healthcare, improve the efficiency of healthcare work flow, reduce waste to enhance the healthcare service quality and bring positive influence towards patient satisfaction. Nevertheless, the deficiency of past studies

revealed that the relationship between Lean, perceived service quality and patient satisfaction is ambiguous and lack of research assessing the mediating impact of perceived service quality in the relationship between Lean and patient satisfaction. To narrow the literature gaps and with aims to examine the tri-dimensional relationship between Lean, perceived service quality, and patient satisfaction, four ROs together with four RQs were developed. In addition, the significance of study with the potential theoretical and practice contribution was explained in the subsection of 1.9. Lastly, the operational terms for all variables' definition as well as the outline of dissertation has also been presented in this chapter.