

**THE INFLUENCE OF TOP MANAGEMENT
COMMITMENT AND TRAINING & EDUCATION
ON THE COMPETITIVE ADVANTAGES IN
JORDANIAN HEALTHCARE SECTOR:
THE MEDIATING ROLE OF QUALITY
PERFORMANCE AND LEAN
SIX SIGMA**

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UNIVERSITI SAINS MALAYSIA

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by

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**Thesis submitted in fulfillment of the requirements
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LIST OF ABBREVIATIONS

CA	Competitive Advantage
DMAIC	Define, Measure, Analyze, Improve, and Control
GDP	Gross Domestic Product
GM	General Motors
KHCC	King Hussein Cancer Center
LSS	Lean Six Sigma
MBNQA	Malcolm Baldrige National Quality Award
NCDEG	National Center for Diabetes, Endocrinology, and Genetics
PDCA	Plan-Do-Check-act
QP	Quality Performance
RBV	Resource-Based View
TE	Training and Education
TMC	Top Management Commitment
TPS	Toyota production system
TQM	Total Quality Management
UNRWA	United Nations Relief and Works Agency

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**Pengaruh Komitmen Pengurusan Tertinggi, Latihan dan Pendidikan ke atas
daya saing kompetitif dalam sektor penjagaan kesihatan di Jordan: Peranan
Penyederhana Pencapaian Kualiti dan Lean Six Sigma**

ABSTRAK

Industri penjagaan kesihatan mempunyai peranan yang penting dan ciri yang unik. Pihak utama yang terlibat dalam industri penjagaan kesihatan ialah pesakit, diikuti oleh keluarga dan rakan mereka. Oleh kerana sebarang kesilapan boleh membawa kesan buruk kepada individu dan kumpulan yang terbabit, serta menjejaskan kehidupan dan kualiti kehidupan pesakit. Industri penjagaan kesihatan merupakan salah satu sektor perkhidmatan yang penting yang memerlukan perhatian yang serius. Peningkatan jumlah kesilapan perubatan secara universal mengakibatkan kira-kira 100,000 kematian pesakit setiap tahun. Untuk meningkatkan kualiti penjagaan pesakit dan meminimumkan kesilapan perubatan, organisasi yang terkait dengan penjagaan kesihatan mesti menggunakan peralatan yang berkualiti, berinovatif seperti pendekatan enam sigma untuk meningkatkan prestasi kualiti. Dalam organisasi penjagaan kesihatan, metodologi enam sigma dapat membantu dalam mengurangkan semua jenis bahan buangan, variasi dan kerja yang tidak sepadan dalam proses perkhidmatan. Prestasi organisasi penjagaan kesihatan seperti hospital perlu dipertingkatkan dengan pendekatan Lean Six Sigma (LSS), yang juga dapat mengurangkan masa menunggu setiap pesakit. Matlamat utama kajian ini adalah untuk melihat bagaimana kelebihan daya saing hospital Jordan yang dipengaruhi oleh penggunaan LSS. Disamping itu, kajian ini juga ingin melihat kesan pengantaraan LSS dan prestasi kualiti organisasi penjagaan kesihatan di Jordan untuk mengkaji hubungan antara komitmen pengurusan atasan dan kelebihan daya saing. Selain itu,

kajian ini juga ingin mengkaji hubungan antara kelebihan daya saing dan latihan dan pembangunan dengan mengkaji peranan pengantara yang dimainkan oleh LSS dalam prestasi kualiti organisasi penjagaan kesihatan di Jordan. Berdasarkan “Resource based Theory” teori Nilai Berasaskan Sumber (RBV) dan teori kontingensi, kajian ini melihat kepada penggunaan LSS dan hubungannya dengan komitmen pengurusan atasan, latihan & pembangunan, prestasi kualiti, dan kelebihan daya saing. Berasaskan teori dan pembolehubah yang berkaitan pengurusan kualiti, beberapa hipotesis penting telah dibangunkan. Metodologi kuantitatif digunakan untuk pengumpulan dan analisis data. Persampelan mudah digunakan dalam kajian ini untuk mengumpul data daripada 647 hospital dan pusat perubatan yang dipilih dengan teliti di seluruh wilayah Jordan. 66 daripada peserta tidak melengkapkan soal selidik dalam jangka masa tertentu (120 minit), membawa kepada saiz sampel akhir sebanyak 581. Oleh itu, 581 soal selidik telah dikumpul dan dianalisis. Akhirnya, 389 respons bernilai dengan kadar tindak balas yang sah sebanyak 66.95%, telah diperolehi. Dengan penggunaan aplikasi perisian SPSS versi 26 dan Smart-PLS, data soal selidik telah dianalisis menggunakan analisis faktor penerokaan (EFA), analisis faktor pengesahan (CFA), dan pemodelan persamaan struktur (SEM). Dapatan kajian ini menunjukkan bahawa walaupun komitmen pengurusan atasan, latihan dan pendidikan mempunyai kesan besar terhadap LSS, prestasi kualiti dan kelebihan daya saing, LSS sendiri mempunyai kesan yang signifikan terhadap faktor-faktor ini di hospital Jordan. Oleh itu, kajian merumuskan bahawa LSS, komitmen pengurusan tertinggi, dan latihan secara tidak langsung mempengaruhi kelebihan daya saing. Kajian ini juga mempunyai kepentingan praktikal dan teori yang meningkatkan kecekapannya. Sebagai contoh, kajian ini boleh menggalakkan profesional dan pengurusan penjagaan kesihatan yang

berbeza untuk mengintegrasikan teknik LSS untuk menyediakan persekitaran yang sihat untuk pesakit, untuk mencapai kelebihan daya saing.

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ABSTRACT

The healthcare industry has held a significant importance in the society as its main aim is to provide health, care and safety for the individuals with health-related issues. The primary stakeholders in the healthcare industry are the direct patients, who are followed by their families and friends. Negligence or mistakes by the healthcare professionals can have catastrophic effects on both individual patients and groups, jeopardizing their lives. The growing number of medical errors universally results in approximately 100,000 patient deaths per year. In order to overcome these issues and enhance patient care by minimizing medical errors, healthcare organizations must employ innovative quality tools such as the lean six sigma (LSS) approach to improve quality performance. In healthcare organizations, the lean six sigma methodology aids in the reduction of wastes of all kinds, variation, and mismatched work in service processes. Hospital performance is enhanced by the LSS approach, which also decreases needless waiting times between value-added activities. In this regard, the role of top management is also inevitable. The study aims to assess the impact of Top Management Commitment and Support as well as Training & Education on the competitive advantage of Jordanian hospitals, incorporating the mediating roles of LSS and quality performance. In order to determine the associations between these variables, Resource Based Value (RBV) and contingency theories were used and important hypotheses were developed. A quantitative methodology was applied for

data collection and analysis. Convenient sampling was used in this study to gather data from 647 carefully chosen hospitals and medical centers across all of Jordan's governorates. 66 of the participants did not complete the questionnaire in given timeframe (120 minutes), leading to the final sample size of 581. Therefore, 581 questionnaires were collected and analyzed. Finally, 389 valuable responses with a valid response rate of 66.95%, were obtained. Using SPSS version 26 and Smart-PLS, the research data were analyzed using exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modelling (SEM). The findings of this study show that while top management commitment, training, and education have a major impact on LSS, quality performance, and competitive advantage, LSS itself has a significant impact on these factors in Jordanian hospitals. Therefore, the study concludes that LSS, top management commitment, and training indirectly influence competitive advantage. This study also holds practical and theoretical importance which increase its efficiency. For instance, this study can encourage different healthcare professionals and management to integrate LSS techniques in order to provide a healthy environment for the patients, in order to attain competitive advantage.

CHAPTER 1

INTRODUCTION

1.1 Introduction

In this chapter, the importance of the present study is discussed, focusing on the background of the study, the Jordanian HC industry, the problem statement along with research questions, and the significance of the study. Furthermore, the remaining chapters' organization is briefly discussed towards the end.

1.2 Research Background

Lean Six Sigma (LSS) is regarded as a primary method to improve quality and performance. LSS is grounded on the integration of lean principles and Six Sigma, which have been in practice for decades. Lean principles have been valuable for their potential to eliminate non-valued practices from the processes of a firm. Six Sigma, is useful in reducing variability and waste generation in the firm processes with the help of robust statistical tools. Scholars have revealed that employing only one of the two approaches may not be fruitful. Therefore, LSS is valued for its integration of the unique attributes of both Lean and Six Sigma, thus allowing firms to capitalize on the unique strengths of both approaches (Asif, 2021). Figure 1.1 shows the points of commonality between both lean practices and Six Sigma.

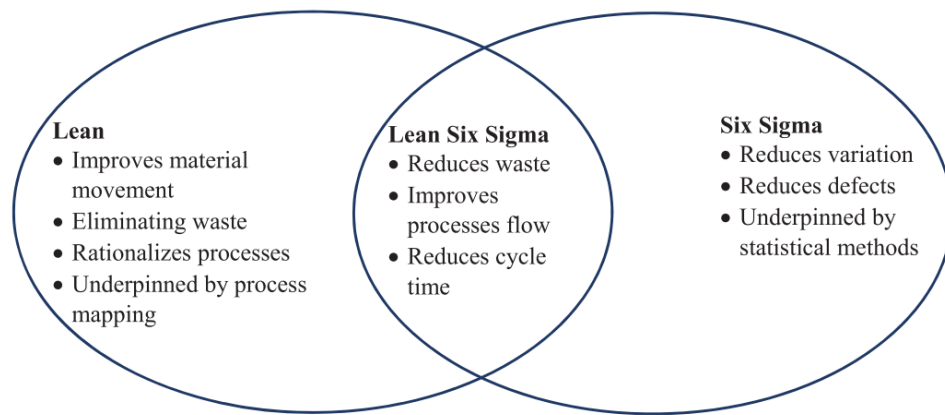


Figure 1.1 Similarities between lean and Six Sigma
Source: Asif (2021)

The implementation of LSS is rather recent in Jordanian healthcare sector, as an effort to improve the sector's market standing. The implementation was mainly factored by the need to reduce errors and wastage and refine the value that the healthcare system offers to the customers (patients). LSS has been known to facilitate the attainment of competitive advantage, and the implementation of LSS among organizations has been on the rise, as reported in a number of extant studies (see Bhat et al., 2019; Al-Tarawneh et al., 2019; Chang et al., 2020; Hundal et al., 2021; Noronha et al., 2021). Clearly, LSS is a vital tool for organization. Still, LSS has not been examined as much within the context of Jordanian healthcare (HC), especially in terms of its effects on competitive advantage. Equally, not much is understood as to the interplay between LSS and QP, and the achievement of competitive advantages among HC organizations in Jordan. Hence, the present study attempts to bridge such gap.

Within the Jordanian HC context, studies on the subject of "Lean," "Six Sigma," or "Lean Six Sigma" were too few – there were very few studies on these subjects thus far. Al-hyari et al. (2016) reported that implementing quality tools like the lean system in Jordanian private hospitals positively affects overall HC performance and positively impacts quality, cost, patient, and staff satisfaction.

Nashawati et al. (2017) discussed the experience of King Hussein Cancer Centre (KHCC), a specialized tertiary care center in oncology, in implementing and maintaining a lean culture. The management of KHCC implemented lean concepts into its strategy through the provision of essential training and orientation on the lean principles, as well as the establishment of a hospital-wide recognition program for exceptional lean projects on a recurring basis. KHCC commenced its journey with an initial submission of 30 projects for the first cycle, then gaining momentum in the second cycle with a total of 60 proposed projects. The authors further laid down some vital elements for success, as follows: effective assistance and support from leadership, active stakeholder involvement, and strong competitive drive in attaining the esteemed lean project award.

Arafeh et al. (2018) demonstrated the application of the Six Sigma process improvement approach in their study at a cancer treatment hospital. The purpose was to decrease the duration of patients' discharge. Duration of all activities from the discharge form completion by the physician to the departure of patient from the treatment room was closely observed. Comprehensive process maps and cause-and-effect diagrams were employed by the authors in data analyses. Results showed that prolonged discharge times were majorly caused by poor communication and inconsistent and non-standardized processes and procedures. As a potential solution, the authors proposed the use of streamlined and uniform procedures, better communication method, and holistic management through the implementation of Six Sigma – the authors demonstrated that using Six Sigma resulted in 54% reduction in patient discharge time from 216 minutes. The authors additionally highlighted a requisite sense of ownership through stakeholder analysis as a vital element of sustainable improvement efforts.

Al-Tarawneh et al. (2019) explored the impacts of the use of Sigma Six standards approach on the quality of healthcare services provided by the Jordanian Ministry of Health (MoH) and concluded that the approach and its sub-variables improved the quality of healthcare services substantially. In another study involving pharmaceutical manufacturing organizations in Jordan, Alkunsol et al. (2019) explored the effect of LSS features on business performance and reported a widespread adoption of LSS variables in the said organizations. The authors further indicated a strong linkage among LSS variables, except between the variables of untapped talent and transportation. Additionally, connections between LSS variables and business performance seemed strong. Finally, the authors reported the impact of LSS variables, except for the variables of extra processing and waiting time, on company performance.

In examining project selection in healthcare logistics, Al-Qatawneh et al. (2019) found that cost, performance and importance of each item in the logistics system were among the factors considered. The authors then proposed the implementation of Six Sigma in healthcare logistics, particularly in Jordanian hospitals. A framework was accordingly proposed, and the benefits of Six Sigma technique application in healthcare logistics were laid down, focusing on product importance, expense, and effectiveness. The authors further delineated the selection process of Six Sigma projects, for efficient handling of healthcare logistical challenges. In improving healthcare logistics, the authors proposed more exploration in Six Sigma application within the context of healthcare logistics.

In 2021, Alkhaldi and Abdallah assessed the impact of implementing lean management on the operational performance of private hospitals in Jordan. Alkhaldi and Abdallah (2021) used four frameworks to analyze Lean management, which

consist of: The concepts of total quality management, human resource management, just-in-time system, and total productive maintenance. The effects of OP aspects on business performance (BP) of the hospitals were examined as well. The study participants were chosen from 25 Jordanian private hospitals – there were 260 individuals taking part in this study. Results showed positive effect of TQM on QP. However, efficiency and accessibility were not affected by TQM. The positive effects of Human Resource Management (HRM) package on all Organizational Performance (OP) dimensions were reported as well. The authors further reported positive impact on JIT bundle on efficiency and accessibility, and positive impact of TPM package on quality and accessibility. Significant and positive impact of quality and accessibility of healthcare services on business performance of hospitals was also reported.

Zuheri et al. (2021) examined the use of LSS techniques within the healthcare sector, with the main purpose of lightening the adverse effect of lengthy waiting times among patients. Outcomes of LSS approaches implementation in healthcare to increase patient satisfaction as reported in the extant literature were thoroughly reviewed, and a consolidated summary was established. Factors contributing to the prolonged waiting times at healthcare centers were identified. The importance LSS implementation in reducing patient waiting times at healthcare facilities was affirmed.

Aljazzazen and Schmuck (2021) examined the impact of the practices of Knowledge Management (KM) on LSS implementation, with human capital as moderator. The significance of human capital knowledge management utility in the LSS model adoption was ascertained through the use of descriptive and inferential methods. The study respondents were supervisory and authoritarian level personnel in five Jordanian government hospitals located in the city of Amman, Jordan. These 467 respondents were selected through a purposive non-probability sampling method. Data

were obtained from the respondents using standardized self-administered questionnaires. The study results validated the substantial positive correlation between KM and adoption of LSS by organization. This study emphasized the need to include human capital as a moderating factor in the implementation of LSS, which is a unique and innovative component of research.

In their recent study, Najim et al. (2022) conducted a comprehensive assessment of the evolution of the Six Sigma dimensions. They highlighted its strategic vision and effective technique for enhancing quality and minimizing defects. The study also emphasized the increasing interest in applying Six Sigma to both industrial and service sectors. The impact of the Six Sigma components (strategic vision, DMAIC cycle, patient (customer) orientation, and hospital commitment to employees) on two indicators of market performance (competitiveness and hospital reputation) in Jordanian hospitals were evaluated. This study also examined the impact of the mediator variable namely acceptance of failure, in hospitals on the correlation between Six Sigma and competitiveness. The findings affirmed the beneficial influence of the three dimensions of Six Sigma on the company's competitiveness and reputation. The DMAIC cycle, nevertheless, seemed to lack a substantial impact. Furthermore, the authors found that the inclusion of failure acceptance as a mediator variable did not demonstrate any noteworthy influence on the correlation between Six Sigma and competitiveness.

ALJAZZAZEN and SCHMUCK (2022) conducted a study to ascertain the required Critical Success Factors to achieve effective LSS implementation in different services' sectors in Jordan. However, these sectors include hospitality, health and education. In addition, the literature on LSS CSF in service sectors in Jordan was examined in terms of its validity and importance, and ALJAZZAZEN and SCHMUCK

(2022) concluded that the careful selection of exceptionally talented persons was the primary determinant in the effective implementation of LSS. The second most influential factor was the dedication and engagement of top management. The primary managerial contribution of this study was in the research findings, as these would assist organizations in determining the most crucial areas of Critical Success Factors for LSS implementation. Additionally, the study would provide insights into the priorities of service organizations in Jordan in LSS approach adoption for business development and achievement of competitiveness through LSS implementation. Furthermore, this work may serve as a catalyst for other researchers to undertake investigations on LSS in underdeveloped nations.

Mistarihi et al. (2023) in their recent article, sought to examine the potential of integrating the DMAIC (define, measure, analyze, improve, and control) approach with discrete event simulation and its effective implementation in the healthcare sector of Jordan. The application of DMAIC and simulation technique was demonstrated in this study, to investigate the reduction of waiting time and improvement of overall system performance in the pediatric emergency department of Princess Rahma Hospital in Jordan. The study demonstrated enhanced process performance and increased productivity in the emergency department by implementing the integrated Six Sigma DES methodology.

In addition, studies, in general, have also revealed the benefits of LSS in terms of enhancing the efficiency in the HC. For example, Rathi et al. (2022) are of the view that LSS, when applied in the HC organizations, can help strengthen their process capability and the efficiency. This is made possible by reducing the waste generation and the chances for potential defects and errors. In addition, LSS not only helps prevent deaths but also helps raise the quality of patient care and minimize the operating costs.

By combining the unique strengths of Lean and Six Sigma, LSS helps manage waste and strengthen process improvement in HC organizations (Kaswan & Rathi, 2019).

This study focuses on how LSS can lead to competitive advantage for HC sector in Jordan. The term competitive advantage that secures superior position, when compared with its rivals, is said to have a competitive advantage. According to Barney (1991), a business has a competitive advantage if it has implemented a strategy that helps create value and this strategy has not been adopted by its competitors. This entails the inability of the rivals to duplicate the strategy. In the context of the HC, a facility is said to possess competitive advantage if it consistently strengthens its performance and delivers high quality services and provided unique value to its patients. Moreover, the sources of this competitive advantage should be valuable, rare, inimitable, and non-substitutable. Since hospitals operate in highly turbulent environment, therefore, these sources of competitive advantage should keep on evolving with the passing time (Singh et al., 2020). Within the sector of HC, it seems crucial for organizations to secure opportunities that would allow them to consistently enhance their competitive advantage, and as highlighted by some scholars (see: AbuAlRub & Alkhawaldeh, 2019), improved QP can drive competitive advantage. With improved QP, HC organizations could provide their patients with high-quality services which can lead to increased patient satisfaction, which can result in a competitive advantage, consequently increasing the organizations' market share.

LSS has been proven a potent tool in streamlining operations and in improving both patient outcomes and organizational performance. Some organizational factors including strong leadership and training have been found highly critical for the successful implementation of LSS, as reported in some studies (see: Mellat-Parast & Bagherzadeh, 2016; Sheikh et al., 2020). In the pursuance of competitive advantage

among HC organizations, QP is critical, especially if they want to stand out in the progressively teeming marketplace (AbuAlRub & Alkhawaldeh, 2019).

The population in Jordan is growing while the HC needs among the people are changing; all these have led to the increasing demand for high-quality HC services. Additionally, the HC industry in Jordan contributes greatly to the economy. Notably, HC systems in Jordan have been facing challenges in various matters, like in assuring patient safety, in optimizing primary healthcare services, as well as in dealing with service delivery quality – this owes to the potential of errors because often times, the consequences are irreparable. The cost of providing healthcare and professional training is rising, and this may substantially jeopardize the system's resources (Limpanyalert, 2018). It is thus imperative for hospitals in Jordan to focus on the aspects of affordability, adaptability, timeliness, and care quality, as these aspects are deemed critical for their survival and success, not only in the local market but in the regional market as well (Diab, 2014; Rahmantya et al., 2019).

1.3 Overview of the Jordanian Health-Care industry

Located west of Asia and north of the Arabian Peninsula, Jordan is a mostly Arab nation. It is almost 92,000 square kilometers in size and has a population of more than 11 million (Worldometer, 2024), the vast majority of whom call Amman their home. Jordanian healthcare (HC) comprises two sectors: public/semi-public and private. Jordan has one of the most advanced HC infrastructures in the Middle East, featuring a comprehensive network of primary HC facilities. With approximately 2.3 centers for every 10,000 people and an average travel time of 30 minutes to the nearest center, Jordan's HC system is considered highly dense by international standards. The private sector plays a significant role in curative primary care, handling around 40%

of all initial patient consultations. The country has 15 inpatient beds per 10,000 people, with 10% of the population admitted to hospitals each year. The average hospital stay is three days, and the hospital occupancy rate stands at 60%. The public sector is financed and administered by the Ministry of Health (MOH) and Royal Medical Services. There are other smaller public programmes, including university-based programmes Jordan University Hospital in Amman and King Abdullah University Hospital in Irbid. On the other hand, the private HC sector consists of 66 hospitals, making up for approximately one-third of the total bed capacity in the country (WHO, 2023).

Jordan is a leading provider of medical services in the region. In 2020, the country allocated nine percent of its GDP to HC services, a figure that is notably high compared to other nations. Jordan has a total of 122 hospitals, with 70 operating in the private sector. Across both public and private sectors, there are 16,057 hospital beds, with public hospitals accounting for 51 percent of these beds. In 2020, Jordan's healthcare expenditures amounted to \$3.79 billion, with pharmaceutical spending reaching \$941 million and medical device expenditures totaling \$311 million. Before the COVID-19 pandemic, Jordan attracted up to 250,000 foreign patients annually, generating over \$1 billion in revenue, which constituted a substantial portion of the country's tourism income. The World Bank ranks Jordan as the top healthcare service provider in the MENA region and a leading destination for medical tourism (ITA, 2022). Jordan has been known for its medical tourism. Approximately 195k patients from foreign nations went to Jordan for receiving medical care in 2021 alone. Moreover, the statistics for inbound medical tourism in Jordan in 2022 show an increment of 25% when compared with the record in 2021. However, the recorded figure still fell short of those for 2019, 235,000 (IMTJ, 2023). For this reason, its

system of healthcare needs to consistently maintain its high-standard patient. Meanwhile, demand for services remains on the rise. As such, the manner in which healthcare institutions transform their strategic management actions into competitive advantages is worthy of scrutiny, since such transformation is crucial for the preservation of healthcare quality and operational excellence. Healthcare is a critical component in Jordan because it shapes the country's national identity and economy. Figure 1.2 shows the revenue generated by the hospitals in Jordan between 2016 and 2024 and the projected revenue till 2028. The hospitals market in Jordan is expected to show a substantial growth in terms of revenue and projected to cross US\$2.15bn by 2024. This growth is expected to be sustained with the annual growth rate of 2.90%. This shows that HC is an important part of Jordan's economy (Statista, 2024).

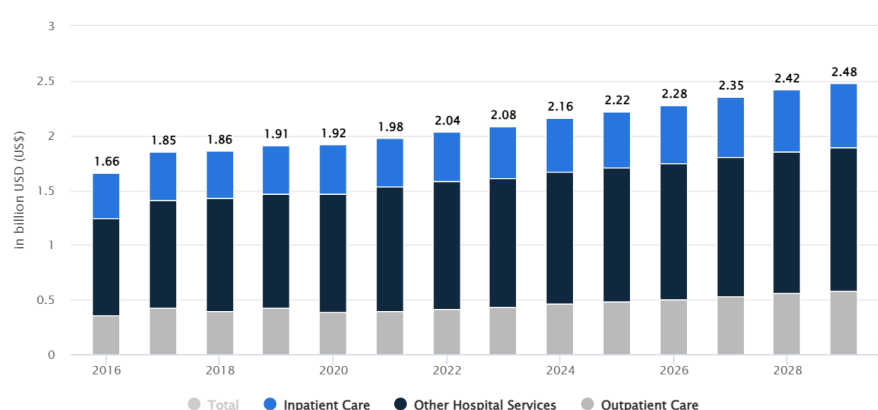


Figure 1.2 Revenue generated by hospitals in Jordan (2016-2028)
Source: Statista (2024)

In coordination with WHO (2005) and the Higher Health Council, a strategy was devised to bring the initiative to fruition. One year later, the MoH Quality Assurance Directorate launched a hospital accreditation program with the Partnership project for restructuring the health sector.

As Al-hyari et al. (2016) argued, implementing quality tools like the lean system in Jordanian private hospitals positively affects the overall HC performance and positively impacts quality, cost, patient, and staff satisfaction. Al-Tarawneh et al. (2019) conducted a similar study on the impact of using the SS Approach to improve the quality of HC services in the Jordanian MoH and found that the Sigma Six standards and its sub-variables have a significant impact on the improvement of the HC services quality that the Jordanian MoH presents. Therefore, it is necessary that LSS and QP are aligned with the strategic management initiatives. Such alignment could facilitate the transformation of the strengths of both the internal management and the workforce into external market competencies.

Hence, the present study tries to understand the effect of LSS as a quality approach to a competitive edge in the Jordanian HC industry by utilizing the RBV and contingency theoretical perspectives. The primary features of the hospital mirror the small company resources investigated in this study. Several major characteristics of hospitals are identified based on a review of the existing research, medical staff experience, hospital age, applied quality tools, support, and support by a specific community.

1.4 Problem Statement

The current research background highlights the studies on the applications of LSS in the HC industry that provide some empirical findings on its effectiveness in improving patient outcomes, reducing costs, and enhancing organizational performance. Previous research has also highlighted the importance of organizational factors such as leadership, culture, and resources in the success of LSS initiatives (Mellat-Parast & Bagherzadeh, 2016; Sheikh et al., 2020). The Jordanian healthcare

sector is critical to the nation's welfare and economic stability. The healthcare system in Jordan has high standards, and so, it is a prominent one in the Middle East, attracting patients, both local and foreign (Nazer & Tuffaha, 2017).

The healthcare system primarily revolves around the life and well-being of human, and so, there is no room for mistakes. Meanwhile, demands for excellence towards this sector are intensifying, making LSS valuable. LSS has indeed been proven efficacious in many sectors. As reported in various studies (see: Rathi et al., 2022; Kam et al., 2021; Tufail et al., 2021; Honda et al., 2018), LSS offers organizations with a systematic methodology to optimize process efficiency through quality improvement and wastage reduction. Meanwhile, the Jordanian healthcare sector has been facing various challenges that require quality enhancement and operational efficiency. Thus, the use of LSS may help the sector in dealing with these challenges. As reported (see: Rababa, 2022; Rathi, 2022; Lyles et al., 2018; Honda et al., 2018), LSS facilitates organizations in preserving their existing standards and in improving and adapting to the altering environment, particularly that of healthcare.

Lean Six Sigma (LSS) is a technique that combines the Lean principles for waste elimination and Six Sigma that decreases variation and defects, resulting in enhanced quality and efficiency (Kam et al., 2021; Honda et al., 2018). Via optimization of process, this robust LSS helps HC organization in decreasing wait times and redundant steps, resulting in improved patient flow and effective use of resources. As reported in studies like Rathi (2022) and Tufail et al. (2021), effective resources use is particularly vital in industries with limited resources and strong demand.

The use of LSS in an HC setting is highly beneficial because this method stresses data-driven decision-making – the domain of healthcare heavily involves decision-making and data (Rathi, 2022). LSS employ data in the identification of areas for improvement; this increases the effectiveness of healthcare in their services, leading to improved patient outcomes. Additionally, the use of LSS decreases errors, and this is particularly vital in healthcare settings because any mistake could result in grievous consequences. In HC sector, service quality has direct impact on the health and satisfaction of patients, and so, it is crucial for HC organizations to implement a methodology that could increase efficiency and quality (Kam et al., 2021; Honda et al., 2018). Within the context of HC, LSS success is mainly factored in TMC and practical training (Alkhaldi & Abdallah, 2019; Ababaneh, 2010). In fact, the significance of TMC in the success of LSS training has been reported in several studies (see Alkhaldi & Abdallah, 2019; Honda et al., 2018; Rathi, 2022; Ababaneh, 2010; Swarnakar, Bagherian & Singh, 2023). Meanwhile, practical training empowers the healthcare workforce to implement LSS methodologies effectively. Through training, healthcare professionals could attain the necessitated skills and knowledge in the identification, analyses and the betterment of processes (Alkhaldi & Abdallah, 2019; Honda et al., 2018; Rathi, 2022; Ababaneh, 2010).

Still, the healthcare system in Jordan is facing a number of challenges, impacting both its quality and efficiency (Rababa, 2022; Mittal & Bashier, 2020; Lyles et al., 2018). The HC sector in Jordan, known for its advanced infrastructure and substantial investment in the sector (ITA, 2022), faces consisted challenges in maintaining and strengthening its competitive advantage. The sector faced challenges like lack of financial resources and HC standardization. Moreover, these challenges also hinder the use of modern digital tools in the sector (Jalghoum et al., 2021). These

factors would impact the sector's potential to sustain high standards in quality performance (QP) and Lean Six Sigma (LSS) practices.

Among the major challenges include resource constraints, increasing patient load, service delivery inadequacy, care quality variability, limited technology and data usage, challenges in the healthcare workforce, patient safety and risk management, and regulatory and policy challenges, as briefly elucidated below:

Resource constraints: The healthcare system of Jordan is limited in terms of resources, as can be evidenced by a dearth of healthcare professionals, equipment, and financial resources, and as reported by Lyles et al. (2018), the increasing demand for healthcare services is making this problem worse, intensifying the burden to the facilities and the staff, that they have become overburdened.

Increasing patient load: The expanding population of Jordan in addition to refugee influxes have resulted in a dramatic increase in the patient load in Jordanian HC facilities. As a result, the existing infrastructure and resources have become more strained, that the wait times have become lengthier, patient-physician interaction time has shortened, while care quality has somewhat deteriorated (El Arab & Sagbakken, 2018).

Service delivery inadequacy: Notable inadequacies have been observed in many of the Jordanian healthcare system processes like in the administrative tasks, procedures of patient handling, as well in the allotment of resources. All these, according to Rababa (2022), can lead to delays in treatment, increased operational costs, and patient dissatisfaction).

Care quality variability: There is a significant variance in the quality of care provided across different healthcare facilities in Jordan. While some hospitals offer high-quality care, others struggle to maintain basic healthcare standards, leading to inconsistent patient experiences and outcomes (Haigh, 2022).

Limited technology and data usage: The underutilization of advanced technology and data analytics in the Jordanian healthcare system hinders its efficiency and quality. The lack of robust health information systems and data-driven decision-making processes means missed opportunities for optimizing healthcare delivery and patient care (Jordan Tops Region as Medical Tourism Hub | Jordan Times, n.d.).

Challenges in the healthcare workforce: The healthcare workforce in Jordan has been facing issues such as uneven distribution of staff, inadequate training, and burnout due to overwork and stress. These factors affect the morale and productivity of healthcare workers, and the quality of patient care they provide (Healthcare System in Jordan: MedXJordan, 2023).

Patient safety and risk management: Issues related to patient safety, including medication errors, infections, and procedural complications, remain a concern. Efficient risk management practices are needed to minimize these incidents and ensure patient safety (Rababa, 2022).

Regulatory and policy challenges: There are also challenges related to healthcare policies and regulatory frameworks, which may not always facilitate the most efficient or effective healthcare practices. Navigating these regulatory environments can be complex and time-consuming for healthcare providers (Rababa, 2022).

Clearly, Jordanian healthcare system needs to focus on operational efficiency and quality improvement. Operational efficiency is integral in cost management and in making sure that the healthcare system is able to meet the growing demand while maintaining its quality. However, as resources are limited, it is even more critical to optimize the existing processes and resources to achieve a competitive advantage (Alolayyan Alyahya, 2023; Alkhaldi & Abdallah, 2019; Sultan & Crispim, 2016; Ababaneh, 2010). Owing to these challenges, Jordanian healthcare organizations need to implement systematic and strategic interventions like LSS, to deal with inefficiencies and increase quality and efficiency (Alkhaldi & Abdallah, 2019). LSS implementation within Jordanian HC could change the current healthcare landscape, resulting in superior patient outcomes in addition to a more sustainable healthcare system (Rathi, 2022; Kam et al., 2021).

Moreover, due to limited literature, there is a lack of understanding of the impact of the top management commitment, along with effective training and education, on the implementation of LSS and QP, as well as the sector's overall competitiveness. Moreover, the specific dynamics of how these organizational factors contribute to competitive advantage through LSS and QP in Jordan's healthcare sector are not fully understood. Research has shown that senior management plays an instrumental role in critical success factors that affect the successful implementation of LSS in an organization. For example, senior management can strengthen communication and a culture of consistent improvement by focusing on employees' development. The support of top management can lead to successful implementation of LSS (Alnadi & McLaughlin, 2021). Therefore, this study focuses on the issue concerning the role of top management in the implementation of LSS and QP initiatives. Bagherian et al. (2022) are of the view that employees training plays a

crucial role in ensuring a successful implementation of LSS. However, there is a lack of understanding regarding how this factor would be useful in the context of implementing LSS in HC. Therefore, another central issue in this study is the role of ongoing training and education programs in enhancing staff competencies, improving quality outcomes, and ensuring successful LSS implementation. Moreover, with the increasing competitiveness in the HC due to the implementation of lean practices (Prado-Prado et al., 2020), it has become quite critical to understand the ways in which the implementation of LSS can lead to a competitive advantage for the sector. Another central issue to be addressed in this study is delineation of the determinants of QP in the HC and how this QP can lead to a competitive advantage in the HC sector. Moreover, the research has revealed that QP not only enhances competitive advantage but also plays a significant mediating role in the impact of organizational factors on competitive advantage (Atmaja et al., 2024). Therefore, this study also focuses on the mediation of QP.

Quality performance (QP) is a logical mediator toward achieving competitive advantage (CA) after Lean Six Sigma (LSS) because improving QP is a direct outcome of effective LSS implementation. LSS focuses on minimizing waste, reducing errors, and streamlining processes, all of which enhance QP by ensuring better service delivery and patient outcomes. Improved QP leads to higher patient satisfaction, trust, and reputation, which are critical components of CA in the healthcare sector. Moreover, in a competitive environment like Jordanian healthcare, consistent QP improvements provide a differentiating factor, enabling organizations to stand out and sustain long-term success. Therefore, QP acts as a bridge that connects LSS initiatives to the broader goal of achieving CA.

Within a very competitive healthcare domain, QP improvement goes beyond patient care, as it also entails a strategic imperative in the attainment of competitive advantage, especially in Jordan, because, as highlighted by Ginter et al. (2018), healthcare in this country is considered a prominent sector for local populations in addition to being part of the expanding medical tourism industry.

At the core of CA through quality improvement is the enhancement of patient outcomes and satisfaction (Abu-Rumman et al., 2022). In Jordan, where healthcare is a critical service sector, hospitals and clinics that demonstrate high-quality care and positive patient outcomes can distinguish themselves from competitors (Aladwan et al., 2021). This is especially important in attracting tourists who are seeking reliable, high-quality medical services. The following points summarize several challenges of achieving competitive advantage in Jordanian HC:

Efficiency and cost-effectiveness: Quality improvement initiatives often increase healthcare delivery efficiency (Akinici & Patel, 2014). In Jordan, where resource constraints are a reality, the efficient use of resources can improve patient care and reduce operational costs (Rababa, 2022). Healthcare providers that can cost-effectively deliver high-quality care have a competitive edge in the market.

Brand reputation and trust: Quality improvement strengthens brand reputation (Godsey et al., 2020). In Jordan, healthcare facilities that offer high-standard care and safety are more likely to draw in and retain patients. Al-Azzam (2016) accordingly reported that reputation for quality is a main differentiator that fosters trust among both the local and international patients.

Accreditation and international standards: Jordanian healthcare providers could substantially improve their position through the compliance with the

international healthcare standards and through the attainment of accreditation from recognized bodies. Such healthcare providers would be viewed as superior in providing patient care and are likely to be preferred by patients (Hijazi et al., 2018).

Innovation in healthcare services: Innovation is an outcome of incessant quality improvement. Accordingly, commitment to quality will push the healthcare providers into the adoption of innovative treatments, technologies, and patient care models, resulting in enhanced patient outcomes while positioning these providers as leaders in the healthcare sector (Abdallah et al., 2021).

Staff competence and morale: Quality improvement efforts could improve training and development for healthcare staff (Daugherty et al., 2013). Within the domain of Jordanian HC, quality improvement efforts will increase staff morale and competence, resulting in improved care quality and, consequently, the achievement of competitive advantage (Mohammad et al., 2020)).

Meeting the challenges of a growing demand: The growing demand for healthcare services among citizens and medical tourists makes it imperative for the Jordanian healthcare sector to provide high-quality care with greater efficiency. Effectively fulfilling such demands can result in attaining a competitive edge for these healthcare providers (Khader, 2021).

The current study seeks to address critical issues in the Jordanian healthcare sector, focusing on implementing Lean Six Sigma (LSS) and its role in achieving competitive advantage (CA). Despite the high standards of healthcare in Jordan, the sector faces significant challenges. It includes resource constraints, increasing load on the patients, variability in the quality of care, limited use of technology, and data-driven decision-making. Top management commitment (TMC) and training/education

are important for adopting LSS successfully. It combines the elimination of waste and reduction in defects so that the quality and efficiency can be enhanced. However, there is a lack of understanding regarding the way through which TMC and training can contribute towards the implementation of LSS, quality performance (QP), and CA in this context. By examining the mediating roles of LSS and QP, this study aims to clarify their impact on addressing these challenges, improving patient outcomes, and fostering sustainable competitive advantage in the Jordanian healthcare sector.

1.5 Research objectives

The objectives of the present research are:

- RO1: To investigate the relationship between top management commitment, training/education, and competitive advantage in the Jordanian healthcare sector.
- RO2: To investigate the relationship between top management commitment, training/education, and Lean Six Sigma (LSS) in the Jordanian healthcare sector.
- RO3: To examine the mediating effects of Lean Six Sigma (LSS) and quality performance (QP) on the relationship between organizational factors and competitive advantage in the Jordanian healthcare sector.
- RO4: To examine the relationship between Lean Six Sigma (LSS), quality performance (QP), and competitive advantage in the Jordanian healthcare sector.

1.6 Research Questions

The present research aimed to answer the following research questions:

RQ1: What is the relationship between top management commitment, training and education, and competitive advantage in the Jordanian healthcare sector?

RQ2: What is the relationship between top management commitment, training and education, and Lean Six Sigma (LSS) in the Jordanian healthcare sector?

RQ3: To what extent do Lean Six Sigma (LSS) and quality performance (QP) mediate the relationship between organizational factors and competitive advantage in the Jordanian healthcare sector?

RQ4: What is the relationship between Lean Six Sigma (LSS), quality performance (QP), and competitive advantage in the Jordanian healthcare sector?

1.7 Research Gap

LSS studies in Jordan are scarce, which explains the relative infancy of this philosophy in a country which is striving forward to improve the healthcare industry - these calls for new management for new global market. The proposed current research titled “The Mediating Role of LSS and QP on the Association between Organizational Factors and Competitive Advantage in Jordanian Health-Care Sector” aims to explore and articulate the intricacies of this relationship. This research will delve into the pivotal roles of LSS and QP as mediators in the relationship between top management

commitment, training and education, and the attainment of competitive advantages in Jordanian healthcare institutions. Top management commitment in healthcare is critical as it sets the organizational vision, fosters a culture of continuous improvement, and allocates resources to strategic initiatives. Training and education, on the other hand, are vital for equipping healthcare professionals with the skills necessary to implement quality improvements and operational excellence and can be transformed into sustainable competitive advantages.

While LSS and QS methodologies are widely recognized for their potential to improve healthcare services (Ahmed et al., 2018b; Rathi et al., 2022), there is a lack of empirical research focusing on this aspect in the context of Jordan's HC. Moreover, there is a substantial theoretical gap when it comes to investigating the impact of organizational factors like top management commitment on the implementation of LSS in HC. As per the discussions, the research gap is evident owing to the lack of comprehensive studies examining the mediating role of LSS in the complex interplay of factors influencing healthcare quality and efficiency. This gap is particularly acute in understanding the dynamics of LSS in specific cultural contexts like Jordan, its role in enhancing employee engagement and performance, and its interaction with other quality improvement methodologies. Addressing this gap is crucial for a deeper understanding of how LSS can be optimally utilized in healthcare settings for improved outcomes. Also, because the HC sector in Jordan faces significant challenges regarding resource constraints and rising demand for high-quality services, it is essential to identify the factors contributing to HC organizations' competitiveness in this context. So, the researcher conducted a study named "Lean Six Sigma and its effect on competitive advantage in the Jordanian Healthcare Sector.

This study aims to bridge the gap in the literature by providing a comprehensive model that elucidates how strategic management practices, through the mechanisms of LSS and QP, can engender a competitive edge in the healthcare sector. In sum, this research will fill a critical gap in the literature by elucidating the pathways through which strategic management commitments are actualized into competitive advantages through the mediating roles of LSS and QP. It is anticipated that the findings will not only reinforce the theoretical constructs but also will provide a pragmatic guide for healthcare leaders, policymakers, and practitioners in Jordan. It is also hoped that the findings will provide them with comparable contexts to refine their strategies for operational and service excellence. The theoretical underpinnings of this research are rooted in the confluence of strategic management theory, quality management principles, and the resource-based view of the firm. This triadic theoretical foundation will provide a multifaceted lens through which the study will interrogate the pathways to competitive advantage in a sector where excellence is a prerequisite, not an option.

1.8 Significance of the study

This study makes significant contributions in terms of methodology, practicality, and theory to the literature on organizational factors, LSS practices, quality performance and competitive advantage among HC institutions in Jordan.

Specifically, this study makes a methodological contribution by applying predictive model assessment via the Q² predict approach within the context of Partial Least Squares Path Modelling (PLS-SEM). Applying predictive model assessment via the Q² predict approach within PLS-SEM represents a significant methodological contribution for several reasons. The use of the Q² predict approach provides a rigorous