Arab American University
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Master Program in Quality Management in Healthcare

Assessing Readiness Factors for Lean Six Sigma Adoption in West Bank Hospitals: A Cross-Sectional Study

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Thesis Approval

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Declaration

I declare that, except where explicit reference is made to the contribution of others, this thesis is substantially my own work and has not been submitted for any other degree at the Arab American University or any other institution.

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Dedication

To the ones who planted the seeds of ambition in my heart and have always been my first support, to my beloved parents, thank you for your endless love and prayers that lit my path.

To my life partner, my dear husband, whose unwavering support, belief in me, and endless patience carried me through every step of this journey; and to my two precious daughters, the light of my life, to whom I dedicate this achievement with the hope that one day you will be proud of your mother.

And to my persevering self, who overcame challenges and never gave up, this accomplishment is the fruit of your determination and self-belief.

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Abstract

Lean Six Sigma (LSS) is increasingly applied in hospitals to enhance efficiency, reduce waste, and improve patient satisfaction. However, its adoption requires organizational readiness, and there is limited evidence regarding readiness factors in the West Bank healthcare context. This study examines factors influencing hospital readiness for the implementation of LSS in the West Bank across governmental and private hospitals, while assessing staff perceptions and awareness of LSS. Using a cross-sectional design and convenience sampling, data were collected from 94 hospital employees in diverse roles through a structured questionnaire and analyzed using Partial Least Structural Equation Modeling (PLS-SEM). Key organizational factors evaluated included management commitment and leadership, organizational culture, training and education, communication and collaboration, resources and infrastructure, and current process evaluation. The results revealed that management commitment and leadership, organizational culture, and resources and infrastructure significantly affect hospital readiness for LSS implementation, whereas training and education, communication and collaboration, and current process evaluation did not exhibit a significant direct impact on readiness. Although training and education significantly enhanced awareness of LSS, the mediating role of awareness in the relationship between training and education and readiness was not supported. Similarity, while JCI accreditation did not moderate the path between organizational culture and readiness, results showed that JCI-accredited hospitals demonstrated significantly higher readiness levels overall, suggesting a potential enabling effect of accreditation. Despite a limited prior knowledge and training in LSS among participants, the perceptions of its benefits were generally positive. These findings highlight critical organizational and contextual enablers necessary for successful LSS adoption and offer practical guidance for healthcare leaders aiming to improve hospital processes and patient care quality through LSS in resource-constrained settings.

Keywords: Lean Six Sigma (LSS), Hospital Readiness, Organizational Readiness Factors, Staff Awareness, Healthcare Quality Improvement.

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List of Definitions of Abbreviations

Abbreviations	Title
AA	Awareness of LSS Impact
AI	artificial intelligence
CB-SEM	Covariance-based SEM
CC	Communication and Collaboration
CI	Continuous Improvement
CI	Confidence intervals
CP	Current Processes
CQI	Continuous Quality Improvement
DMAIC	Define, Measure, Analyze, Improve, and Control
DV	Dependent Variable
GE	General Electric
GHMP	Good Hospital Management Practice
HAIs	Healthcare-associated infections
IAH	Istishari Arab Hospital
IOM	The Institute of Medicine
IoT	The Internet of Things
IRB	Institutional Review Boards
ISO	The International Organization for Standardization
IT	Information technology
IV	Independent Variables
JCI	Joint Commission International
KM	Knowledge management
LSS	Lean Six Sigma
ML	Management Commitment and Leadership
NGOs	Non-Governmental Organizations
NNUH	An-Najah National University Hospital
OC	Organizational Culture
OR	Operating room
PhD	Doctor of Philosophy
PLS-SEM	Partial Least Squares Structural Equation Modeling
PMoH	Palestinian Ministry of Health
RCTs	randomized controlled trials
RFC	Readiness For Change
RI	Resources and Infrastructure
RL	Readiness Level
SEM	Structural Equation Modeling
TCU ORC	The Texas Christian University Organizational Readiness for Change
TE	Training and Education
TPS	Toyota Production System
TQM	Total Quality Management
UNRWA	United Nations Relief and Works Agency

US	United States
VBHC	Value-Based Healthcare
WHO	World Health Organization

Chapter One: Introduction

1.1 Overview

In this chapter, a general background about the importance of the implementation of continuous quality improvement (CQI) approaches in healthcare sector in the Palestinian community is presented. The focus will be on the Lean Six Sigma (LSS), Six Sigma, and Lean Thinking. The research justification is introduced, and a mention of the study questions and aims was stated. Further in this chapter; detailed hypothesis is explained to reach the end with thesis structure.

In the contemporary healthcare landscape, hospitals are compelled to enhance their service delivery, procedural frameworks, strategic approaches, operational processes, and workforce capacities in response to the emergence of novel technologies and treatment modalities, such as artificial intelligence (AI), the Internet of Things (IoT), blockchain, and wearable technologies. Given that the quality of healthcare services provided is of paramount concern to multiple stakeholders, including healthcare providers, patients, and their respective families, it is imperative to thoroughly investigate and address the factors and barriers that hinder the provision of optimal care (Sinha, 2024).

According to the World Health Organization (World Health Organization: WHO, 2023), roughly 10% of patients encounter harm in healthcare settings, resulting in over 3 million annual deaths attributed to unsafe care. In low-to-middle income nations, the toll is even more alarming, with as many as 4 out of 100 individuals due to unsafe care (World Health Organization: WHO, 2023).

Significantly, over 50% of this harm, affecting 1 in 20 patients, is preventable, with medication-related issues accounting for half of these incidents. The ramifications extend beyond the healthcare sector, potentially reducing global economic growth by 0.7% annually. Indeed, when considering the broader global context, the indirect costs associated with such harm amount to trillions of US dollars each year (World Health Organization: WHO, 2023).

In the United States alone, an estimated 4,000 surgical errors occur annually, paralleled by approximately 400,000 hospitalized patients who endure preventable harm, and regrettably, these incidents contribute to around 100,000 fatalities each year. Consequently, the financial cost of medical errors amounts to approximately $20 billion annually. This unsettling statistic emphasizes the fact that medical errors rank among the

leading causes of injury and death in the United States, compels all healthcare professionals to adhere to the fundamental principle of "first do no harm" and actively collaborate in efforts to mitigate both human and systemic errors (Rodziewicz et al., 2024).

Zangaro et al. (2023) emphasized that the majority of medical errors do not arise from the actions of individuals or a specific practitioner's group thereof. Instead, the root causes are predominantly traceable to systemic or process failures that inadvertently lead healthcare providers into making mistakes. Error prevention hinges on adopting a systemic approach that restructures healthcare systems to prohibit incorrect harmful actions and promotes the patient safety culture among workers. Beyond the fiscal burden, it is imperative to recognize that the impact of medical errors extends well beyond financial implications, encompassing profound emotional and physical tolls on patients, their families, and the healthcare professionals entrusted with their care (Mahat et al., 2024; Sokol-Hessner et al., 2024; Robertson & Long, 2018).

CQI approaches including Total Quality Management (TQM), Lean Thinking, Six Sigma and many others are essential in healthcare to enhance patient care quality, safety, efficiency, and overall performance**.** To be more specific, hospitals need to implement continuous improvement (CI) initiatives to sustain quality for several important reasons; patient safety is the priority for every healthcare facility (Rodziewicz et al., 2024).

CI projects help provide safe and effective care through identifying errors, mitigating risks and inefficiencies that can compromise patient safety. Regular assessment and improving processes can prevent medical errors and adverse events and this will position the hospital to long-term sustainability maintaining its financial stability and community trust.

A common goal between CI tools implemented in healthcare is to provide patient-centered care; such as reducing patient's wait times and improving communication which can lead to higher patient satisfaction and loyalty (Sunder et al., 2019).

Regulatory compliance through accurate analyzed data concerning every process will facilitate hospital to maintain licenses and certifications which are essential to keep work in best levels depending on staff engagement and healthy teamwork to achieve everyone's objectives (Bawab, 2019).

Another important motivator for implementing CI projects is cost saving by either eliminating wasteful practices or reducing unnecessary costs. Optimizing processes

through definite standards and protocols will help in allocating resources more effectively leading to the possibility to reinvest in infrastructure improvement (Hill et al., 2020).

CQI approaches include many tools and methods such as Lean Thinking and Six Sigma that all aim to enhance quality provided to customers. They started to be used in the manufacturing sector to achieve excellent successes, and their applications expanded to healthcare (McDermott et al., 2022). The combination of Lean and Six Sigma creates the term Lean and Six Sigma (LSS), in which this unit is more effective for CI in the business environment (Rathi et al., 2022). This encourages policy makers to adopt LSS in the healthcare industry which deals with saving lives; so, errors can't be acceptable at any cost.

1.2 Healthcare Situation in Palestine

The total population in Palestine reached 5,483,450 people at the middle of 2023, with 3,256,906 residing in the West Bank which accounts for 59.4% of the entire Palestine's population (Ministry of Health, 2024).

Regarding the healthcare system in Palestine, it comprises of four primary sectors: the government health sector, which includes the Palestinian Ministry of Health (PmoH) and Military Medical Services; the United Nations Relief and Works Agency (UNRWA); Non-Governmental Organizations (NGOs); and the private sector. These sectors collectively work to provide healthcare services to citizens at all levels, including primary, secondary, and tertiary care. The PmoH places significant emphasis on ensuring the continuity of the Palestinian healthcare system and delivering high-quality comprehensive health services to all citizens (Ministry of Health, 2024).

Over the years, the number of hospitals in Palestine has increased. In 2010, there were 76 hospitals, with 51 located in the West Bank. By 2023, the number of hospitals had risen to 59 in the West Bank; with two of them having the Joint Commission International (JCI) Accreditation (Ministry of Health, 2024).

In 2023, based on the health annual report, the number of doctors was 9,561 in the West Bank. While the number of nurses reached 13,252 works in hospitals in the West Bank. This increase in numbers enhances the quality of health services provided and facilitates access to the necessary treatment in a shorter time (Ministry of Health, 2024).

1.3 Research Significance and Justifications

Up to the researcher knowledge, although a study about the degree of Six Sigma adoption in the West Bank hospitals have been carried out (Abed, 2012), none have assessed the enablers and barriers for the effective implementation of LSS, nor have studied the readiness factors for the implementation of LSS. Furthermore, revealing the degree of perceptions and awareness of LSS principles among healthcare workers is a fundamental outcome from this study which will require extra preparations to increase the understanding of LSS methodology.

Therefore, this study is the first study conducted in Palestine to assess the factors that are directly involved in quality improvement methodologies, specifically LSS, in the West Bank hospitals to fill this gap besides the measurement of staff perceptions and awareness. The results of this study will be used as a baseline to work on the most important factors to facilitate the process of CQI in the healthcare sector in its both branches; managerial and medical services.

1.4 Research Problem

To determine the evolving needs of customers and competitors within healthcare organizations, LSS can help to concurrently achieve excellent services, process improvement, and waste elimination. The major goals of LSS implementation in hospitals are to increase efficiency, lower expenses, and shorten wait times thus customers' satisfaction will be obtained (Rosa et al., 2024).

Before initiating the change process, it is important to assess the readiness level in order to successfully implement LSS in healthcare organizations. The readiness factors assist management in understanding the degree of employee acceptance of engaging LSS within the organization. Explaining the methodology, the need for LSS, cost-cutting procedures, and the process of continuous improvement increases employee involvement and promotes the advancement of the hospital. The need for this study lies in the fact that challenges such as transforming organizational mindsets, inadequate training, and limited awareness of LSS concepts significantly increase the cost and time associated with implementation which contribute to the slower adoption of LSS practices in the developing countries (McDermott et al., 2022).

The Palestinian healthcare sector faces numerous challenges and obstacles, particularly in the realms of change management and innovation. These challenges refer to the sensitive political climate and unstable work conditions affecting healthcare center. Despite all difficulties, skilled competencies availability characterizes the sector, they are compelled to implement initiatives including targeted training courses and expanding knowledge to enhance quality of provided services even in the significant external constraints resulting in obtaining best practices.

1.5 Research Objectives

Main aim of this study is to identify the key factors that affect the readiness of hospitals in West Bank to implement LSS principles effectively. While research objectives are:

1. To assess hospital staff's perceptions and awareness of the LSS methodology and its potential impact on healthcare delivery.
2. To evaluate whether JCI Accreditation enhances the readiness level of hospitals for LSS implementation.

1.6 Research Questions

The study addresses the following research questions:

1. What are the related readiness factors that affect the implementation of LSS in hospitals in the West bank?
2. What are the direct and indirect relationships between key organizational factors and hospital readiness for LSS implementation?
3. What is the extent of perceptions and awareness among hospital staff in the West Bank, both governmental and private, regarding the principles of LSS?
4. Are the hospitals with JCI Accreditation more ready to adopt LSS?

1.7 Study Hypothesis

In this study the readiness level (RL) of LSS implementation is the dependent variable (DV). Referring to the most relevant literature, six main factors are the leading to the organization readiness to adopt the LSS techniques in their strategic agenda; management commitment and leadership support (ML), organizational culture (OC),

employee training and education (TE), and effective communication and collaboration within the organization (CC). Availability of resources and infrastructure (RI) and evaluation of current processes and systems (CP) are strongly affecting the readiness level of hospitals (S. Al-Balushi et al., 2014; McDermott et al., 2022; Vaishnavi et al., 2019). These six factors act as independent variables (IV) in this study.

Mediator variables explain the mechanism through which an independent variable influences a dependent variable. In this study the awareness of LSS impact (AA) will mediate the association between training and education and the readiness to adopt LSS in daily hospital processes since training and education will increase the knowledge of LSS which in turn improve the readiness level (Hair et al., 2017, pp. 56-57).

While JCI accreditation act as a moderator in this context; moderating variables are predictor variables that strengthen the association between independent and dependent variables, or between predictor and outcome variables (Hair et al., 2017, pp. 54-55), when it is achieved, the chances to be more ready for LSS acceptance among staff will increase.

Table 1.1 identifies the role of each variable. The author considered the integration of the key factors identified in the literature that influence readiness levels as a comprehensive representation of the hospital's overall behavior.

Table 1.1: Identification of Variables' Roles

Variable	Role
Management Commitment & Leadership	IV
Organizational Culture	IV
Resources & Infrastructure	IV
Training & Education	IV
Communication & Collaboration	IV
Evaluation of Current Processes	IV
Awareness of LSS Impact	Mediator
JCI Accreditation	Moderator
Hospital Readiness for LSS Implementation	DV

IV: independent variables, DV: dependent variable.

Accordingly, Table 1.2 summarized the research hypotheses that could be constructed to be tested in the study.

Table 1. 1: Research Hypothesis

Code	Description	Hypothesized Path
PLS-SEM causal (direct) effect hypotheses		
H1	Management commitment and leadership positively influence hospital readiness for LSS implementation	ML → RL
H2	Organizational culture positively influences hospital readiness for LSS implementation	OC → RL
H3	Training and education positively influence hospital readiness for LSS implementation	TE → RL
H4	Communication and collaboration within the organization positively influence hospital readiness for LSS implementation	CC → RL
H5	Availability of resources and infrastructure positively influences hospital readiness for LSS implementation.	RI → RL
H6	Evaluation of current processes positively influences hospital readiness for LSS implementation	CP → RL
PLS-SEM mediation effect hypotheses		
H7	Staff awareness of LSS impact mediate the relationship between training and education and hospital readiness for LSS implementation	TE → AA → RL
Other: moderator, comparative and correlations hypotheses		
H8	JCI Accreditation strengthens the relationship between organizational culture and hospital readiness for LSS implementation	OC → JCI → RL
H9	There are significant differences in the mean of the perceptions and awareness of LSS among the participants based on their demographic factors (i.e., age, gender, educational level, work experience, and job title)	
H10	There are significant discrepancies in LSS familiarity among participants based on their demographic variables	
H11	Hospitals with JCI accreditation exhibit significantly higher levels of readiness for LSS implementation compared to non-JCI hospitals.	

RL: readiness level, ML: management commitment and leadership support, OC: organizational culture, TE: training and education, CC: communication and collaboration, RI: resources and infrastructure, CP: evaluation of current processes, AA: awareness of LSS impact, JCI: the Joint Commission Accreditation.

The first and second research questions were addressed through Hypothesis H1-H6, which assess the extent to which six key organizational factors, derived from LSS literature, are related to hospital readiness for implementation. While question three is addressed through Hypotheses H7 and H9**,** which examine the indirect effect of training on readiness through staff awareness, and explore the variation in LSS perceptions and awareness across staff demographic characteristics.

Lately question four is investigated through Hypotheses H8 and H11**,** which examined whether JCI accreditation moderates the relationship between organizational culture and readiness, and whether accredited hospitals demonstrate significantly higher readiness levels compared to non-accredited ones. Table 1.3 aligns each hypothesis clearly with a specific objective and research question.

Table 1.3: Alignment of Research Objectives, Questions, and Hypotheses

Objective	Research Question	Hypothesis
To identify the key factors that affect the readiness of hospitals in West Bank to implement LSS	What are the related readiness factors that affect the implementation of LSS in hospitals in the West bank? What are the direct and indirect relationships between key organizational factors and hospital readiness for LSS implementation?	H1, H2, H3, H4, H5, H6
To assess hospital staff's perceptions and awareness of the LSS methodology and its potential impact on healthcare delivery	What is the extent of perceptions and awareness among hospital staff in the West Bank, both governmental and private, regarding the principles of LSS?	H7, H9

To evaluate whether JCI Accreditation enhances the readiness level of hospitals for LSS implementation	Are the hospitals with JCI Accreditation more ready to adopt LSS?	H8, H11

1.8 Feasibility of the Study

The implementation of LSS in hospitals has gained global attention as a strategy to enhance healthcare quality, reduce waste, and improve patient satisfaction. However, in the Palestinian healthcare context, particularly in the West Bank, the adoption of LSS remains limited and fragmented. Currently, there is no systematic deployment of LSS methodologies in most hospitals, and awareness among healthcare staff is generally low, with quality improvement initiatives typically focusing on traditional accreditation and compliance requirements rather than structured process improvement frameworks like LSS. This situation highlights a critical gap in understanding the readiness of hospitals in Palestine for LSS adoption, which is essential for driving sustainable quality improvement.

The motivation for this study arises from the urgent need to enhance hospital processes and patient outcomes in resource-constrained settings, such as the Palestinian healthcare system, where challenges include capacity constraints, limited resources, and increasing demand for high-quality care. Assessing organizational readiness for LSS implementation will provide healthcare leaders with evidence-based insights to guide change initiatives and prioritize interventions to improve quality and efficiency. Given the limited availability of empirical studies exploring LSS readiness in Palestine, this study aims to fill this gap and support hospitals in adopting structured, data-driven improvement methods aligned with global best practices.

Several potential barriers to conducting the study were anticipated, including limited awareness of LSS concepts among staff, potential reluctance to participate due to workload pressures, and administrative delays in securing approvals for data collection. To address these challenges, the study employed clear and simplified survey tools with concise explanations of LSS concepts to ensure respondents understood the context of the questions. Engagement with hospital leadership was established early to encourage staff participation and support the data collection process. Additionally, anonymity and

confidentiality assurances were provided to respondents to encourage honest and accurate responses.

Overall, the study is feasible due to the researcher's access to some healthcare institutions in the West Bank, institutional support from participating hospitals, and the use of validated research tools and a clear analytical framework further supports the robustness and practicality of the research. By systematically assessing hospital readiness for LSS, this study offers practical value and actionable recommendations to guide the adoption of LSS within the Palestinian healthcare context.

1.9 Study Limitations

This study has some limitations that should be considered when interpreting the findings. The use of convenience sampling, based on the accessibility of participants rather than random selection, limits the representativeness of the sample and may introduce selection bias. Additionally, the sample was collected only from hospitals in the West Bank, which restricts the generalizability of the results to other regions or healthcare systems with different structures, resources, or organizational cultures. The relatively small sample size further limits the breadth of conclusions, as it may not fully reflect the diversity of perspectives and experiences present across the Palestinian healthcare sector or in similar low-resource settings.

Because the study relied on data collected through questionnaires that were self-reported, potential response bias was introduced. Participants may have provided socially desirable answers or may have misunderstood some items, which could affect the accuracy of the data. While every effort was made to ensure the clarity and neutrality of the questionnaire items, the subjective nature of self-assessment remains a limitation.

Furthermore, the use of a cross-sectional research design limits the ability to draw conclusions about causality or to assess the long-term effects of LSS implementation. As data were collected at a single point in time, the study cannot account for changes in perceptions or outcomes that may occur as LSS initiatives evolve or mature within an organization. Longitudinal studies would be better suited to examining the sustained impact of LSS practices and the progression of staff readiness and organizational change over time.

One methodological limitation of the study is the absence of a dedicated section in the questionnaire explicitly designed to measure hospital readiness level. This limitation

was identified during the data analysis phase. To address this, a set of readiness-related items were selected from various independent constructs that conceptually reflected aspects of organizational preparedness. Although the post hoc construction of the readiness construct was validated statistically, future studies may benefit from designing a targeted, theory-based set of items specifically intended to measure readiness as a standalone construct.

Despite these limitations, the findings provide valuable preliminary insights that can inform future research and practice, particularly within the context of healthcare systems in resource-constrained environments. Further studies with larger, more diverse samples and longitudinal designs are recommended to build on these results and enhance their applicability.

1.10 Thesis Structure

The thesis is divided into five sections. The first chapter provides an introduction with an overview about the importance of adopting CQI initiatives in healthcare facilities and depicts the healthcare situation in Palestine. Research problems are well defined in this chapter with the justification on the importance of this study. Study questions and detailed view of theoretical framework and hypotheses are established besides of the objectives intended to be achieved.

Chapter two reviews the literature on staff perceptions assessment regarding LSS along with the readiness factors identified for LSS implementation. While the third chapter focuses on the study methodology which includes sampling design and data collection methods. Chapter four provides data analysis and illustrates the results along PLS-SEM method. Finally, the last chapter gives a discussion about study findings, a conclusion with limitations, future research suggestions explaining practical and theoretical implications, and recommendations.

1.11 Chapter Summary

Chapter one provides a comprehensive introduction to the study, highlighting the critical importance of CQI approaches, particularly LSS, within the Palestinian healthcare sector. It outlines the global and regional healthcare challenges, emphasizing the high

incidence and impact of medical errors and the necessity of systemic improvements to enhance patient safety and care quality.

The chapter presents an overview of the healthcare system in Palestine, describing its structure and current status, including hospital capacities and workforce distribution. It also articulates the research significance by identifying gaps in the existing literature regarding LSS readiness in Palestinian hospitals.

The research problem is clearly defined, focusing on the need to assess organizational readiness and staff awareness for effective LSS implementation amid challenges like limited training and political instability. Specific research objectives and questions are formulated to guide the study, and detailed hypotheses are proposed to examine the relationships between key organizational factors, staff awareness, JCI accreditation, and hospital readiness.

Additionally, the chapter discusses the study's limitations related to sampling, data collection, and research design, acknowledging constraints while underscoring the value of the preliminary insights gained. Finally, it presents the overall thesis structure and confirms the feasibility of conducting this research within the Palestinian healthcare context.

Chapter Two: Literature Review

2.1 Overview

The purpose of this chapter is to investigate the existing literature on the readiness of the healthcare sector to implement CQI initiatives; particularly LSS. Many studies were reviewed globally and regionally to assess the potential for adopting LSS within the West Bank hospitals. This chapter outlines the foundational improvement methodologies; Lean Thinking, Six Sigma and their integration within the LSS approach. Subsequently, it explores the key factors that influence hospital readiness for LSS implementation, including organizational, cultural, and resource-related aspects, to identify both enablers and challenges relevant to the Palestinian healthcare context.

In any industry, the successful implementation of CI projects depends on several critical elements; including enablers and motivators for team engagement, the availability of critical success factors, and strategic planning to overcome constrains (Walley, 2013). In the healthcare sector, the urgency to improve service quality and enhance patient satisfaction is particularly pronounced. This highlights the importance of examining the readiness factors that influence the adoption of LSS as a necessary step toward embedding best practices and achieving sustainable improvements.

The Institute of Medicine (IOM) outlined a framework consisting of six aims for the healthcare system, emphasizing the delivery of care that is safe, effective, patient-centered, timely, efficient, and equitable (Institute of Medicine, 2001). Evaluating healthcare service performance involves assessing how well providers deliver services that adhere to these six aims. By using the IOM domains as a framework for assessment, healthcare organizations can more effectively identify areas for improvement and support the provision of higher-quality care (Institute of Medicine, 2001).

In recent years, healthcare systems worldwide have faced many pressures to improve the service quality provided, reduce medical errors and operational issues and enhance patients' satisfaction. The integration of Lean thinking and Six sigma principles leads to the emergence of LSS; a robust continuous improvement methodology. LSS proved its effectiveness in minimizing waste, standardizing processes, and improving the overall quality of patients care (Rathi et al., 2022). Literature had well- documentation on the benefits of LSS in healthcare sector across various countries, ensuring that successful

implementation often depends on staff awareness, knowledge of LSS principles, and the presence of critical readiness factors in the organization.

Assessing the level of staff perceptions and awareness of the impact of LSS will primarily provide a foundational understanding of how much the institution is ready to embrace this methodology practices. Since the hospital staff' aim is to enhance the delivered care to patients, it is crucial to continuously try to improve their skills within a supportive environment to let them engage in the improvement cycle (Drotz & Poksinska, 2014). Conversely, a lack of awareness will result in change resistance and obstacle the improvement initiatives (Albliwi et al., 2014).

Aligned with the evaluating of the current perception level of LSS, the organizational readiness status plays a substantial role in LSS adoption. Readiness for change compromise from both psychological and operational aspects (Weiner, 2009). Psychological readiness is what concerned with individuals' potential and capability to move on new work guidelines. While the operational aspect includes several factors; leadership and management commitment are essential motivators besides the encouraging organizational culture and the efficient staff training required. The resource-constrained settings in the West Bank, where healthcare sector is challenging from unique operational, financial and political issues, make the understanding of these factors even more important.

This chapter reviews existing literature concerning LSS in healthcare and gives a brief overview of LSS effects and principles in healthcare, emphasizing staff awareness and essential readiness components. It also presents areas of gaps in knowledge and contextual elements affecting the implementation of LSS in the Palestinian healthcare system.

2.2 Search Strategy

A literature review was conducted to identify the key factors influencing hospital readiness for the adoption of LSS in healthcare settings, with particular emphasis on staff awareness and perceptions. The search was performed using selected academic databases, including PubMed, Scopus, ScienceDirect, and Google Scholar.

The keywords used in the search included: "Lean Six Sigma (LSS)", "hospital readiness", "organizational readiness factors", "staff awareness", and "healthcare quality

improvement". These terms were combined using Boolean operators such as AND and OR to refine the results and capture relevant literature.

The search focused on peer-reviewed articles published in English between 2010 and 2025. Studies were included based on their relevance to the topic, particularly those examining LSS implementation in healthcare organizations and its association with readiness, awareness, and quality improvement. Articles were excluded if they did not focus on healthcare, lacked relevance to readiness or awareness, or were not available in full text.

Although this review did not follow a systematic review protocol, literature selection was guided by thematic relevance, clarity, and scholarly quality. The results of literature were used to inform the conceptual framework and support the discussion of study variables.

2.3 Overview of LSS

For a clear comprehension of LSS, it becomes necessary to analyze quality management fundamentals. The development of TQM and the concepts of CI has enriched the concepts of Lean thinking and Six Sigma methodologies over time. These methods have proven useful in increasing efficiency and minimizing costs and wastes and promoting quality in most industries, including healthcare (Antony et al., 2017).

2.3.1 Introduction to Lean Thinking

Due to Toyota's inception of the Toyota Production System (TPS), the term Lean emerged under the direction of Japanese engineers Taiichi Ohno and Shigeo Shingo (Inman, 1999). The TPS is based on the optimum utilization of resources with minimizing waste for better quality and workflow through the application of value stream mapping and Kanban (Drotz & Poksinska, 2014).

The term "Lean" came originally from Krafcik's work (1988) when he used it to define Toyota's distinctive method, which diverged from conventional Western systems based on extensive inventories and long production runs (Drotz & Poksinska, 2014).

Lean can be defined as a set of principles and tools that aimed at helping industries produce higher- quality products or services by eliminating waste and non- value-added process steps (Alkaabi et al., 2021; Yeh et al., 2011). When an organization decides to

adopt lean techniques, the first and most essential step is to define value from the customer's perspective and then eliminate any unnecessary processes or sources of waste that do not contribute to value creation (Inman, 1999). In this context, waste can be observed in many resources; time, personnel, capital and work environment. The eight well known wastes are: transportation, inventory, motion, extra-processing, overproduction, unused potential, time, and defects (Alkaabi et al., 2021; Radnor et al., 2012).

To do more with less is a real concern for every business, so Lean's efficacy is recognized to cut more expenses to gain higher quality services through streamline process without delay or unwanted bottlenecks and producing services on actual demand to guarantee the efficient use of resources (Womack & Jones, 1997; Ayaad et al., 2022; Aljazzazen & Schmuck, 2021). Finally, Lean's fifth principle is to always seek perfection by creating a supportive culture of continuous improvement especially in complex sectors such as healthcare (van Kleeff et al., 2023).

Lean was first adopted in manufacturing industries, successively moved to other service sectors and recently to healthcare as an improvement approach focus not just on eliminating waste (muda in Japanese), rather on enhancing workflow and achieve perfection (Drotz & Poksinska, 2014).

D'Andreamatteo et al. (2015) provides an extensive analysis of Lean implementation within healthcare settings in their comprehensive review. They conclude that Lean principles in healthcare are predominantly applied to enhance productivity. Hospitals, especially emergency and surgical departments, are the most common settings for Lean implementation.

Lean is more than an improvement methodology to be considered as a management philosophy that can change employees' mindset. In healthcare, the staff need to provide enhanced care to the patients in shorter waiting times and fewer medical errors (Drotz & Poksinska, 2014).

2.3.2 Introduction to Six Sigma

Dating back to the 1980s, to overcome the economic consequences of World War II, Motorola Corporation developed Six Sigma as a quality improvement methodology rooted in the basics of TQM. The primary objective was to overcome the issue of

defective outcomes arising from the complexity of manufacturing products (Barr & Brannan, 2024).

Japanese management transformed Motorola's operational management and enabled it to produce televisions with only one-twentieth the number of defects compared to previous production levels (Pyzdek & Keller, 2010; see also Pyzdek & Keller, 2023). Six Sigma is built on statistical tools and techniques like control charts and regression, aimed at optimize processes by defining variation at each stage, thereby reducing defects to the acceptable minimum and ensuring a higher quality final product that meets customers' expectations in terms of quality, cost, and delivery (Aljazzazen & Schmuck, 2021).

The successful achievements of Motorola Corporation encouraged other companies like General Electric (GE), AlliedSignal, and Sony to follow their suit adopting Six Sigma principles and tools, leading to broader adoption across industries (Pyzdek & Keller, 2010; see also Pyzdek & Keller, 2023).

It is pertinent to highlight the well-established Six Sigma approach known as (DMAIC), which represents the five core phases of the process improvement framework. The Define phase focuses on identifying the current problem and customers' requirements. This is followed by the Measure phase, which involves the evaluating of the status based on data not assumptions and using statistical tools. The root causes of the problem are identified and assessed in the Analyze phase so then in the Improve phase a structured plan should be developed and implement solutions to address the root causes effectively. Finally, the Control phase is necessary to ensure the sustainability of the improvements by monitoring the new process and putting measures in place to maintain the gains over time (Pyzdek & Keller, 2010; see also Pyzdek & Keller, 2023).

Six Sigma is not a one- time project but a philosophy that consistently seeks more effective solutions. It promotes a culture of continuous improvement and safety culture by engaging every worker in the organization, from the top management to the front-line employee, in the pursuit of quality and efficiency (Barr & Brannan, 2024).

2.3.3 Integration of Lean and Six Sigma

In the field of management systems, both Lean management and Six Sigma are well- established methodologies for process improvement and are widely recognized as quality management approaches. These two philosophies share a common goal: to create

a culture of continuous quality within organizations by enhancing employee involvement and investing in their education and training. Conclusively, both methodologies aim to achieve higher quality outcomes and foster a customer-centered organizational environment (Rathi et al., 2022; Arnheiter & Maleyeff, 2005).

Clark et al. (2013) mentioned that Lean management emphasizes customer needs and promotes a value-adding process through data-driven, continuous improvement efforts. While Lean is effective in improving workflow and eliminating waste, it may lack the ability to maintain process stability required in sustained improvement.

So, it was critical to address this gap enhancing process stability and reducing variation that Six Sigma do using the structured DMAIC methodology – Define, Measure, Analyze, Improve, and Control (Bawab, 2019). However, Six Sigma benefits from Lean's strengths in streamlining processes and decreasing waste in resources (Aljazzazen & Schmuck, 2021).

Although organizations can achieve significant benefits by implementing either Lean or Six Sigma individually, integrating both approaches leads to more favorable and sustainable improvement outcomes. This effective and complementary framework, known as Lean Six Sigma, combines Lean's focus on waste reduction and efficiency with Six Sigma's emphasis on defect reduction and statistical precision. LSS as a methodology for improving process performance offers several advantages to organizations, including the reduction of waste and non-value-adding activities, the use of customer feedback in decision-making, and improvements in product quality, production processes, and delivery (de Freitas and Costa, 2017).

Ultimately, LSS is not merely a set of tools and techniques, but a strategic methodology which aligned closely with the organizational goals and promotes sustainable improvement (Rathi et al., 2022).

2.3.4 Application of LSS in Healthcare

The adoption of LSS in healthcare has grown in significance due to increasing pressure to deliver high-quality patient's care with limited resources (McDermott et al., 2022). Recently, competitiveness within healthcare organizations has increased positively; each hospital is always attempting to provide better care with a focus on high service quality, less waiting times, and much more patient satisfaction. Furthermore, the obvious expanding in the healthcare sector, in public and private hospitals, has played a

role in increasing demands to continuously improve operational processes to secure a position at the forefront of the sector (Rathore & Srivastava, 2020).

Antony et al. (2017) highlighted that in an increasingly globalized and demanding environment, characterized by rising customer expectations and complex operational challenges, LSS must evolve into a more strategic, data-informed, and sustainable methodology. The future of LSS lies in its ability to be both adaptive and opportunity driven. Crucially, they stress that the integration of Lean; centered on process efficiency, and Six Sigma; focused on precision and quality, should be context-specific, tailored to the unique nature and needs of the problem at hand.

By integrating powerful quality improvement methodologies, such as Lean and Six Sigma, healthcare organizations can streamline patient flow, reduce waiting times, minimize medical errors, and optimize resource utilization (Rathore & Srivastava, 2020). Moreover, LSS promotes collaboration and staff empowerment, making it a valuable tool for driving organizational transformation in complex environments (McDermott et al., 2022). Recent evidence highlights the importance of engaging healthcare employees in continuous improvement practices as part of their daily work, fostering a culture that encourages problem-solving and operational enhancements in real time (Robinson et al., 2022).

Literature suggests that the adoption of LSS in the healthcare sector began after 2005. Numerous studies have since been conducted globally, though to a lesser extent in developing regions (Rathi et al., 2022).

In this context, a lot of hospitals and medical centers have integrated LSS into their organizational strategy and embedded its principles in their continuous improvement initiatives by using the DMAIC framework which is the most effective structure for applying LSS in various healthcare departments, adaptable to different project needs to enhance their operational efficiency, cutting costs, and reducing patient waiting times over time to deliver high-quality healthcare services (Rathore & Srivastava, 2020; Noori, 2015; Al-Zuheri et al., 2021).

Overall, LSS is competent in enhancing quality, streamlining operations, and boosting healthcare institutions' competitiveness in a demanding environment. Yeh et al. (2011) had found in their empirical study, which been conducted to enhance the operational process of acute myocardial infarction in Taiwanese hospital using LSS framework DMAIC, that the improvements translated into substantial cost savings, totaling $ 4.422 million in medical capital. This was because of the decrease in the cycle

time for the door-to-balloon procedure by 58.4%, and the improved efficiency; from 32.27% to 51.81%, and the average hospital stay was reduced by three days.

Though LSS has considerable promise for enhancing healthcare systems, its application is hampered by a number of challenges. The complex and dynamic nature of healthcare presents significant challenges to standardizing procedures and implementing process improvements (McDermott et al., 2022). By comparison to other industries, healthcare has a slower rate of quality initiative adoption because of bureaucratic slowdowns, embedded organizational cultures, and uncertain clinical requirements (Bhat et al., 2019; Noronha et al., 2021).

Patient care-related safety concerns also hamper or make improvement processes challenging (Drotz & Poksinska, 2014). Notwithstanding the obstacles, LSS is a promising system for increasing efficiency and value in healthcare. Its success relies on marrying technical solutions and cultural change, aligning efforts with organizational strategic directions, and engaging meaningful staff participation (McDermott et al., 2022).

Rathore and Srivastava (2020) pointed out that for LSS to make a broader impact in healthcare, it must be used in the entire sector, not merely in specific instances. It has also been recommended that accrediting organizations must make it obligatory for the participation of trained experts like Black Belts in order to achieve sustainable quality improvements.

The subsequent section presents an extensive review of effective LSS implementations in numerous hospital units and working areas of both developed and developing nations.

2.3.5 Global Case Studies of Successful LSS Implementations

The implementation of CQI strategies in the healthcare sector has risen over the years worldwide due to the clear results of enhanced performance through operation excellence, improved patient care, and cost reduction. Various case studies present instances of the positive integration of LSS practices in various healthcare settings.

One of the most beneficial LSS outcomes is efficiency improvement which has a number of advantages for hospital. To enhance operating room (OR) efficiency in California's academic children's hospitals, 612 surgical cases applying LSS concepts and tools (DMAIC framework) in seven Ors were examined. Significant improvements were

achieved; the Turnover Time (the time between when one patient leaves the OR and the next patient enters) was reduced by approximately 22%, and the Turnaround Time (the time between completing the surgical dressing and when the next patient enters the OR) showed a significant improvement which decreased by approximately 13%. Authors concluded that LSS methodologies can effectively streamline OR processes, leading to enhanced efficiency in pediatric surgical settings (Tagge et al., 2017).

Hill et al. (2020) examined 11 electronic databases and assessed 28 randomized controlled trials (RCTs) to evaluate the effectiveness of CQI in healthcare settings, finding the results to be limited and inconsistent. Most of the RCTs were conducted in high-income countries, and less than half of the studies showed positive effects over non-CQI approaches, mainly on clinical process measures. The leadership involvement in the CQI interventions emerged as one of the success factors of LSS implementation, in combined with their meeting frequency and the use of certain model (for example; Plan-Do-Study-Act). However, the strength of these findings is undermined by the fact that all included RCTs were assessed as being at risk of bias.

Since 2014, the focus of research has increasingly moved toward developing nations, which are in greater need of effective healthcare systems. According to Rathi et al. (2022), 41% of the studies concerned with organizations in developing regions, with 30% of those specifically focusing on healthcare sector in India.

In departments such as oncology, excessive waiting times for patients undergoing chemotherapy are highly undesirable. An exploratory case study conducted by a team of experts applied LSS methods in India, led to a significant reduction in process cycle time, from ten days to a just one day, achieved enhanced care and increased patient satisfaction (Chaurasia et al., 2017).

LSS has been applied effectively in multiple departments to solve critical healthcare problems. In order to minimize the rate of healthcare-associated infections (HAIs), which patients acquire while receiving care in a healthcare facility like hospitals, the DMAIC framework was used at the university hospital in Napoli in Italy. A comparison of pre- and post-LSS intervention data showed a notable decline in HAIs and proved the effectiveness of LSS in improving process efficiency as well as patient safety (Montella et al., 2017).

Momani et al., (2017) undertook a research study with the aim of enhancing safety awareness among healthcare personnel through the application of the DMAIC methodology. The initiative started by defining the precise occupational safety

information necessary for each healthcare professional's role. After conducting this, the researchers evaluated employees' existing level of awareness and implemented targeted interventions based on areas of identified gaps. The deployment of this systematic and evidence-driven approach brought about a dramatic enhancement in compliance levels from 74.2% to 84.4%. The study showcases the extent to which process improvement models such as DMAIC can be effectively implemented in the healthcare sector for promoting proactive safety culture and improving service.

2.4 Quality Improvement & LSS in the Palestinian Healthcare Context

LSS has increasingly become a useful framework in the Palestinian healthcare system for enhancing service delivery, in optimizing the utilization of resources, and in cultivating a culture of CQI. Despite being in the initial stages compared to other countries, LSS has already found application in a number of healthcare institutions in Palestine for dealing with particular operational and quality issues.

Abu Jasser (2023) provide a holistic review of the healthcare system of Palestine, describing its framework, challenges, and the role of information technology in optimizing service provision. The authors cite the National Health Strategy (2017–2022), noting the necessity of enhancing accessibility, preventive healthcare, and improving quality services. The paper concludes by noting the relevance of standardized information systems in health as well as strong policies and collaborations toward enhancing the quality and accessibility of healthcare in Palestine.

Several studies have demonstrated the successful implementation of LSS methodologies in the Palestinian context. For example, Sarsour (2024) noted the utilization of LSS tools in streamlining processes and eliminating inefficiencies in healthcare institutions. The present study is a master's research at the Palestine Medical Complex in Ramallah aimed at enhancing patient flow at the level of the emergency department through the application of LSS concepts and obtained tangible improvements in waiting times. The study determined the main areas of inefficiencies through value stream mapping and both staff and patient feedback analysis. The findings pointed towards areas of pressing requirement such as staffing and beds alongside improved IT (information technology) systems and communication.

Another applied LSS project at the same medical complex investigated the adherence to the Safe Surgery Checklist in orthopedic surgeries. The initiative used LSS

tools such as root cause analysis and DMAIC methodology to identify gaps and implement corrective measures, resulting in improved compliance rates (Amarni, 2024).

The GHMP (Good Hospital Management Practice) model developed in the assessment of perceived healthcare service quality at Palestinian hospitals in Nablus provided a structured framework for evaluating service delivery and patient satisfaction. Findings illustrate that TQM principles are not prioritized in most hospitals. Although the model does not directly apply LSS, its findings highlight service quality gaps, such as staff responsiveness and administrative efficiency, that align with common LSS target areas (AL-Adham, 2024).

On a strategic level, a doctoral dissertation assessed the implementation of Value-Based Healthcare (VBHC) in Meso-level hospitals in Palestine, revealing low adoption levels due to weak governance, limited IT used, and cultural resistance. Some improvement was noticed in cutting costs and service tracking, despite limitations in policy support and infrastructural constraints. The findings highlight the need for stronger governance, collaboration, and investment in infrastructure to support VBHC in resource-limited, conflict-affected settings (Samara, 2025).

Beyond the public sector, LSS has also been implemented in the pharmaceutical industry. A study at Birzeit Pharmaceutical Company used DMAIC methodology to streamline packaging processes, demonstrating LSS's adaptability in both clinical and non-clinical settings (Housheya, 2021).

A study examining Six Sigma deployment in private hospitals in Palestine found a moderate level of adoption and significant variability based on the level of management commitment, staff training, and availability of resources (Abed, 2012). This aligns with general results on TQM and integration of Industry 4.0 in healthcare in Palestine showing gaps in commitment from the leadership and readiness for digitization, staff awareness of the technological systems and capacity, and as challenges in full deployment (Zaid et al., 2024).

Regarding perceived quality results, research has highlighted the capacity of LSS and associated quality systems to improve patient satisfaction, minimize errors, and enhance standardization. For instance, assessments of the quality of care for thalassemia patients' services identified areas of inefficiencies which LSS would be able to improve upon. Comparisons between hospitals in the West Bank, Gaza Strip, and Dubai Thalassemia Center determined the hospitals in Palestine generally lagged behind patient expectations in areas of availability & accessibility (Atweh, 2016).

A study by Sharikh et al. (2019) at UNRWA healthcare centers in Gaza assessed the role of LSS practices in improving the quality of physiotherapy services. Through surveys of nearly 50 physiotherapists from multiple centers, the researchers established a positive correlation between adherence to LSS tools and service quality improvement. The greater part of centers already used the practices, and this correlated well with very high levels of patient satisfaction. The results suggest the utility of systematic quality improvement strategies in healthcare and especially when complemented through continuous staff development and customized incentive systems. The research indicates the promise of LSS in being able to contribute significantly both to improving healthcare efficiency and patient experience, particularly in settings of limited resources.

Despite growing interest, literature also notes significant challenges. These include limited expertise in LSS tools, lack of standardized quality metrics, fragmented healthcare governance, and underfunding. Nonetheless, ongoing research and pilot projects continue to build momentum toward a more systematic use of LSS in Palestinian healthcare institutions.

2.5 Staff's Perceptions and Awareness of LSS

Human capital plays a vital role in sustaining CI efforts within organizations, with staff engagement being a key driver of success (Laureani & Antony, 2016). Langton & Robbins (2006) defines staff perception as the way in which employees interpret, understand, and emotionally respond to various aspects of their work environment, and as a result, these perceptions affect staff' acceptance or resistance to change.

Knowledge management (KM) is an important enabler in preparing staff readiness for quality improvement initiatives such as LSS. Akbari and Ghaffari (2017) define KM as a structured process for creating, sharing, and organizing knowledge to advance organizational performance. In the context of healthcare, effective KM can equip employees with the necessary understanding to actively contribute to and sustain LSS initiatives (Gowen et al., 2009). However, the highly stressful nature of the work in hospitals can significantly influence staff perceptions, which in turn affects their willingness to adopt new systems like LSS, engage in training or improvement efforts, and support organizational changes.

Interestingly, despite LSS's roots in the manufacturing sector, relatively few studies have assessed the depth of staff awareness and understanding in that context. As Goetsch

and Davis (2006) and Albliwi et al. (2015) argue, sustainable success in healthcare, like in any other industry, requires not only strong management systems but also well-informed teams who understand quality improvement strategies and possess the skills to apply them effectively.

Gowen et al. (2009) examined how transformational leadership and quality management initiatives, including LSS, impact organizational performance in some United States hospitals, emphasizing the mediating role of knowledge management. Based on a survey of 370 hospitals, the study found that leadership and quality practices enhance knowledge responsiveness, which significantly influences performance. Transformational leadership's effect was fully mediated by knowledge management, while quality initiatives showed partial mediation. These findings highlight the need for leadership that promotes learning and knowledge sharing to boost staff awareness and the success of LSS implementation.

Changing employees' mindsets proves usually a demanding task when staff are unaware of LSS fundamentals; in this case, the challenge becomes even higher, resulting in wasted time and improvement opportunities, and ultimately impacting the effectiveness of the implementation process (McDermott et al., 2022; Panizzolo et al., 2012; Enoch, 2013).

Aljazzazen and Schmuck (2021) researched the impact of KM practices on LSS application in Jordanian hospital and the moderating effect of human capital. Their conclusion validated the fact that efficient KM practices greatly contribute toward the implementation of LSS effectively. The study points out the fact that the success or failure of LSS programs highly relies on staff learning and awareness, with adaptation toward LSS standards. These findings reflect the necessity of developing both knowledge-sharing cultures and staff preparedness toward sustainable quality improvement initiatives.

Sreedharan et al. (2016) emphasized that awareness is a foundational element for the successful implementation of LSS. According to the authors, LSS not only helps organizations recognize its potential benefits but also promotes a culture of quality and continuous improvement, serving as a base for comprehensive training and skill development across all organizational levels.

Similarly, Mills and Smith (2011), in their study *"Knowledge Management and Organizational Performance: A Decomposed View,"* highlighted those organizational resources, such as design and the application of knowledge, are directly linked to

performance outcomes. These results underscore the need for healthcare institutions to promote a culture that encourages knowledge sharing and continuous learning to enhance the impact of LSS initiatives.

Numerous studies have confirmed that staff awareness and perception are central to successful adoption of LSS in healthcare. Understanding of the methodology's purpose, tools, and expected outcomes affects staff engagement and the sustainability of LSS efforts.

In the Palestinian healthcare context, however, LSS awareness levels remain generally low. Sharikh et al. (2019) found that although LSS practices led to increased patient satisfaction in UNRWA physiotherapy services, many staff members lacked formal training. They recommend that to enhance staff perception of LSS the leadership to be committed, fixed training programs, and adopt reward system. Likewise, Amarni (2024) reported that initial staff resistance and unfamiliarity with checklist protocols posed challenges during LSS-based interventions in orthopedic surgeries.

Lack of awareness has been cited as a major barrier not only to implementation but also to embedding a culture of CI (Albliwi et al., 2015; Gowen et al., 2009). Where staff awareness is weak or unclear about methodology benefits, resistance to change increases, and improvement efforts often fail to achieve lasting impact. Thus, enhancing LSS literacy across all staff levels is not only a training necessity but also a strategic enabler of system-wide transformation.

In conclusion, increasing staff knowledge and awareness of LSS is essential for its effective integration in healthcare settings. Overcoming awareness-related barriers can lead to more successful LSS outcomes, ultimately advancing healthcare quality and operational efficiency (Kaye & Anderson, 1999).

2.6 Hospital Readiness for LSS Adoption

Organizational readiness reflects how prepared institutions are, both structurally and culturally, to initiate and support change initiatives (Borkowski & Meese, 2021). It encompasses the mindset of employees and their willingness to engage in change processes. According to Weiner et al. (2008), readiness includes both psychological and behavioral aspects, representing how individuals perceive their ability and motivation to participate in organizational change. Jansen (2000) similarly defines readiness as an

organization's internal capacity for change and the degree to which staff recognize the need for it.

Organizational change itself refers broadly to any adjustment in a system's structure, composition, or processes (Bowditch & Buono, 2001). In healthcare, this may involve adopting new clinical protocols, improving patient flow, or implementing quality frameworks like LSS. Weiner (2009) offers one of the most widely cited frameworks for understanding organizational readiness for change. His theory defines readiness as a shared psychological state in which organizational members feel committed to implementing a change and confident in their collective ability to do so. Central to this model are two key constructs: change commitment, which reflects the perceived value and importance of the change, and change efficacy, which captures the group's belief in its capability to carry out the change successfully. This model has been foundational in implementation science, offering a conceptual basis for predicting whether change initiatives, such as LSS in healthcare, are likely to be successfully adopted and sustained. By framing readiness as both a motivational and capability-driven condition, Weiner's theory has laid the groundwork for subsequent research and tool development aimed at assessing and enhancing organizational change capacity.

While Weiner's (2009) model offers a clear conceptual foundation, it is has some limitations. One key shortcoming is its primary focus on psychological readiness, which tends to ignore the structural and contextual factors that can significantly influence change efforts; especially in complex environments like hospitals. Additionally, the model assumes a uniform perception of readiness across the entire organization, failing to account for the varied subcultures that often exist within healthcare institutions. Another notable limitation is the lack of practical tools for assessing readiness or actionable strategies to enhance it. As a result, the model often needs to be supplemented with other frameworks to be effectively applied in real-world settings (Scaccia et al., 2015).

In the context of LSS, hospital readiness refers to an organization's overall capacity to adopt and implement the methodology effectively. This readiness encompasses several critical elements, including committed leadership, engaged staff, clear and open communication, and access to the right resources. As highlighted by Helfrich et al. (2011), the success of any organizational change depends on multiple factors; such as how employees perceive the change in terms of desirability and feasibility, the strength of leadership commitment, the quality of planning, and the presence of systems to monitor

progress. Without these foundational elements, even well-established approaches like LSS may face significant barriers to be implemented.

Here it is important to recognize that being ready to implement LSS doesn't automatically guarantee its success. Readiness is about the organization's initial ability to begin the change, but true success is measured by long-term outcomes; better patient care, increased efficiency, or improved service quality (Helfrich et al., 2011).

Borkowski and Meese (2021) emphasize that strong participative leadership, clear and open communication, and a shared vision are essential for fostering a workplace environment where readiness for change can truly take root. When teams trust their leaders and understand the goals ahead, they are more likely to support new initiatives without resistance. By combining behavioral theory with organizational change models, Borkowski and Meese (2021) offer a consistent understanding of what true readiness means, especially when navigating complex improvement efforts like LSS.

Understanding what organizational readiness entails is critical for predicting how effectively a new initiative will be implemented. Helfrich et al. (2011) provide a useful framework that identifies the core elements influencing readiness, including how valuable the change is perceived to be, the level of leadership commitment, and the organization's openness to innovation. This perspective defines readiness not only as a preliminary requirement for initiating a project, but also as a dynamic and measurable state that reflects an organization's ability to proceed effectively. In response to this growing need, recent research has focused on developing practical tools to assess readiness, particularly in healthcare environments where change is often complex and high-stakes.

One widely used tool is the Texas Christian University Organizational Readiness for Change (TCU ORC) instrument, developed by the Institute of Behavioral Research (2005). Built on Weiner's (2009) foundational concepts, the tool evaluates key areas such as staff motivation, resource availability, organizational climate, and staff capabilities. It has proven particularly useful in both healthcare and behavioral health settings, valued for its structure and reliability. The TCU ORC also complements broader frameworks like Helfrich's et al. (2011) by offering actionable insights for planning and implementation. However, its original design for behavioral health environments may limit its direct applicability to other settings, such as acute care. Furthermore, its reliance on self-reported data and its length can present challenges, particularly in time-pressured clinical contexts (Lehman et al., 2002).

While organizational readiness assessment is a critical initial process in implementation, the process is still complex owing to the variety of available tools and the difficulty in choosing the optimum one. In response to this problem, Khan et al. (2014) developed an online decision support tool intended to assist researchers and implementers in choosing contextually appropriate, measurable, and reliable readiness assessment measures. This was created through a multi-phase approach involving the identification of evidenced-based instruments from healthcare environments, mapping items to conceptually defined readiness domains, and a Delphi-modified approach using stakeholder consultations to increase the relevance, usability, and applicability of readiness assessment in actual practice. By providing users with the option to choose measures that are applicable to their respective implementation environments, the decision support instrument could ultimately lead to better planning and successful change implementation in healthcare and other domains.

2.6.1 Key Readiness Factors affecting LSS Adoption

Organizational readiness is influenced by diverse internal determinants that collectively establish the degree to which a hospital can adopt and maintain quality improvement like LSS. Such determinants function across the structural, cultural, and individual domains. The selection of factors in this study was guided by a thorough review of LSS-specific empirical and conceptual literature**,** particularly in healthcare contexts. Comprehensive studies such as Al-Balushi et al. (2014) and Vaishnavi & Suresh (2020b) identify leadership, culture, training, communication, and infrastructure as critical enablers of LSS readiness.

These elements also reflect the items measured in the questionnaire specifically created for this study which includes constructs for Management Commitment and Leadership, Organizational Culture, Training and Education, Communication and Collaboration, Availability of Resources and Infrastructure, and Evaluation of Current Process and Systems. These six key readiness elements incorporated into this study are supported by these and other studies, and are discussed in detail in the following subsections.

2.6.1.1 Management Commitment and Leadership

Leadership and management commitment is widely acknowledged in the literature as one of the key factors in the successful adoption of LSS in the healthcare context (Vaishnavi & Suresh, 2020b; Laureani & Antony, 2017). Emphasizing that a strong leadership role expands strategic planning and direction; it also fosters a supportive culture for CI and innovation. Leaders' active engagement also has a significant impact on staff attitudes towards the importance and sustainability of LSS initiatives (Ahmed et al., 2018).

Studies indicate that the absence of leadership commitments and involvement, quality improvement efforts fail to deliver long-term effects. Laureani and Antony (2017) in their systematic review explain the requirement for leaders to embed LSS strategically and also to foster the CI culture actively. Further, the review identifies the gap in the available models specifically related to the context of LSS and concludes that the traditional leadership style might not suit the collaborative character of LSS entirely.

In resource-limited healthcare circumstances, leaders will face both technological and cultural barriers toward change. So, equipping leaders to be capable of guiding staff through such changes is a key to LSS preparedness in the organizations.

Top and middle management have a critical role in the successful implementation of LSS in healthcare sector. Leaders set the vision, align LSS with broader organizational agenda, and ensure the necessary resources are in place to support change (Al-Balushi et al., 2014).

Transformational leadership, in particular, fosters change-readiness by empowering staff, creates shared vision, and sustaining engagement over time (Coleman, 2017). Without strong leadership commitment or with reliance solely on transactional methods, LSS efforts risk being shallow or resisted. Middle managers, who acting as the bridge between executive leadership and frontline staff, are essential in turning strategic goals into practical actions. As Birken et al. (2012) note, they play four key roles: sharing and interpreting information, connecting strategy to daily work, and championing innovation. These functions help overcome communication gaps, link strategy with clinical operations, and create a culture where LSS can take root and thrive. More recently, Boutcher et al. (2022) reinforced these ideas, showing that middle managers also act as knowledge brokers who facilitate healthcare innovation, drive practice changes, and sustain continuous improvement.

Studies in different regions, from the US, India, Italy, and others, assessed the role of committed leadership towards developing an improvement-focused environment (Al-Balushi et al., 2014; Narayanamurthy et al., 2018; Vaishnavi & Suresh, 2020a; Rosa et al., 2024; Shreeranga et al., 2019; Sohal et al., 2022). They summarized the role of leaders in establishing priorities, resource allocation, eliminating resistance, and maintaining motivation. In contrast, McDermott et al. (2022) conducted a comprehensive literature survey on LSS in healthcare and recognized the lack of management commitment and weak leadership as key impediments to the implementation of LSS. They pointed out the need for top management commitment since it gives the organization a strong perception of the initiatives significance and facilitates the elimination of organizational barriers during implementation process.

Most importantly, healthcare organization readiness to implement any quality improvement project is directly connected with leadership support and management engagement in the whole process to ensure adequate supervision and continuous commitment; particularly when resource shortage is the case.

2.6.1.2 Organizational Culture

Organizational culture is the common values, norms, and behaviors guiding the workers in an organization to collaborate to achieve goals. A supportive organizational environment encourages open communication, trust, and teamwork, which collectively represent the key elements for staff engagement and organization success (Ajmera & Jain, 2019). This culture promotes both performance and a healthy workplace where employees are valued and motivated.

Schein's organizational model posits that culture exists at three interconnected levels: artifacts (observable structures and processes), espoused values (declared goals and strategy), and underlying assumptions (firmly rooted beliefs) (Schein, 1983). This model is especially valuable in explaining the role of culture in shaping change since it identifies the hidden variables leading to organizational change being either supportive or obstructive.

A culture that encourages new strategies regarding learning, collaboration, and innovation directly affects an individual's readiness for change. Vaishnavi and Suresh (2020a) mentioned in their study in India that culture can either support or hinder the adoption LSS based on the perception employees have of the environment's attitude toward change innovations.

To effectively deploy LSS, applying its tools and techniques is not enough, culture needs to be changed as well and need to move towards a no-balm culture that focuses on reducing waste, controlling variability and promoting continuous improvement (Antony et al., 2017). Achieving this transformation depends on aligning organizational values with employees' beliefs and practices. Without such alignment, attempts to institutionalize LSS may face resistance and fail to produce sustainable improvements (Aljazzazen & Schmuck, 2021). A quality-driven culture, therefore, serves as a prerequisite for successfully embedding any quality methodology (Psychogios & Tsironis, 2012).

Organizational climate, while closely linked to culture, is considered more tangible and observable. Driving cultural change often requires focusing on altering the organization's climate through changes in policies, practices, and procedures. These visible changes influence employees' perceptions, beliefs, and ultimately, their behaviors (Amnis, 2012). For instance, shifting reward systems from quantity-based to quality-based reinforces the value of quality in employees' minds (Schneider et al., 1996). Similarly, Schein (1999) emphasized that adjustments in work procedures, policies, and reward systems can shape behaviors and influence organizational climate.

Because climate can either facilitate or hinder change, it is directly tied to an organization's readiness for change (RFC). McNabb and Sepic (1995) identified key factors influencing RFC, including organizational culture, climate, policies, and performance outcomes. Bouckenooghe et al. (2009) further emphasized that both the climate for change and the processes involved in change are critical enablers of RFC. These factors can ultimately determine whether a change initiative succeeds or fails. Thus it is important to understand the current situation in the organization in order to determine the needed preparedness to change and the likelihood for success.

2.6.1.3 Training and Education

As healthcare organizations strive to enhance service quality and efficiency through LSS, building internal capacity through structured education becomes a critical enabler. Rather than focusing solely on tools and procedures, LSS requires a shift in mindset and competencies particularly among frontline staff. So, employees must learn to interpret data, engage in problem-solving, and adopt a continuous improvement culture (Albliwi et al., 2014).

This highlights the value of human capital, which is defined as the collective skills, creativity, and adaptability of staff, that is essential for sustaining change (Alnoor, 2020; Hatch & Dyer, 2004). However, without targeted training programs, knowledge gaps can weaken readiness and fuel resistance (Ajmera & Jain, 2019; Ismail & Mohamed, 2024).

Successful initiatives often combine technical instruction with experiential learning and emphasize team-based workshops and mentorship. Research has shown that LSS-specific training improves both staff confidence and their ability to contribute meaningfully to implementation efforts (Vaishnavi & Suresh, 2020a). In this context, continuous learning is not just desirable, it's necessary. It ensures that staff are not only aware of LSS principles but are also empowered to apply them effectively in dynamic healthcare environments (Aljazzazen & Schmuck, 2021).

2.6.1.4 Communication and Collaboration

Effective internal communication enhances readiness by ensuring that goals, expectations, and roles are clearly understood across departments. Top management should clearly communicate the requirements of LSS, including the change process, implementation steps, and review mechanisms. At the same time, leadership must create channels for employees to voice their concerns and offer suggestions. This two-way communication not only promotes transparency but also helps build employees' confidence and comfort in engaging with the initiative, ultimately increasing their willingness to support and participate in the implementation (Vaishnavi & Suresh, 2020b).

Searchers emphasized that communication breakdowns can impair even well-planned initiatives (Ajmera & Jain, 2019; Vaishnavi et al., 2019). Collaboration between departments fosters knowledge sharing and builds alignment, which are essential in complex change environments like hospitals.

2.6.1.5 Availability of Resources and Infrastructure

Successful implementation of LSS in healthcare depends profoundly on the availability of critical resources: human, technological, time and space, and financial (Vaishnavi et al., 2019).

Skilled personnel are important as they execute LSS and sustain the CI culture alongside with technological infrastructure, like process automation tools and data management systems, help in monitoring tracking the performance and evidence-based

decision-making. While financial investment is crucial for funding training programs, new technology adoption, and quality projects implementation.

However, health care organizations in resource-limited settings face constraints in one or more of these dimensions which significantly impact LSS readiness. Limited funds which cause delay or hinder improvement projects, with insufficient or burned staff and weak IT infrastructure slow down data collection and process analysis.

Such resource gaps lead to a decrease in implementation efficiency and burnout or demotivation of staff as there is no alignment between expectations and the available capacity. Hence it is vital to assess, quantify and strengthen the base of resources in order to enable organizational readiness and achieve sustainable LSS performance. (Albliwi et al., 2014).

2.6.1.6 Evaluation of Current Processes and Systems

Readiness for change becomes much more accessible when the initiatives of LSS are closely aligned with the organization objectives and goals, and when the initiatives are supported by evaluation mechanisms in order to monitor the progress. According to Al-Balushi et al. (2014), having a solid measurement system is key for any organization to track improving over time.

In healthcare, a well-designed measurement system is especially important for guiding the implementation of LSS. If such a hospital has no clear idea of its current performance, it would be difficult to determine the opportunities for improvement and how to prioritize changes. This can be a real problem in environments where metrics are weak or absent (Al-Balushi et al., 2014).

A strong measurement system is important for value stream analysis and enhancing accountability making it easier for teams to monitor progress. For the best impact, the indicators of choice should be accurate, relevant, and simple enough for everyone in the organization to understand and use.

Sohal et al., (2022) conducted a study of a large public healthcare institution and reported some critical elements of success that highlight the role of strategic planning and operational execution. Effective deployment of solutions and establishing sustainability plan that includes guidelines for corrective action were noted as key contributors to project success. Furthermore, solid governance, monitoring of performance, clear sponsorship visibility, and stakeholder engagement stand as essential factors for boosting long-term impact and organizational readiness for LSS initiatives.

On the contrary, according to Albliwi et al. (2014), a systematic review assessed LSS projects failure causes across different sectors, including healthcare. The common factors were lack of leadership support, insufficient training of staff, incorrect selection of projects for improvements, poor alignment between efforts and organizational goals, and resources unavailability. In healthcare, the resistance to change, communication gaps, and challenges with data management and analysis were mainly found as obstacles for effective adoption. These findings imply that in order for LSS to succeed in healthcare organizations, they ought to move beyond their technical solutions and should foster a culture of leadership commitment, staff engagement, and strategic clarity. And so, potential causes of failure should be recognized and mitigated in order to improve readiness level of effective LSS implementations (Albliwi et al., 2014).

In summary, the reviewed literature noted that healthcare readiness has multiple dimensions to assess; which are leadership, culture, training and education, resources and infrastructures, communication and collaboration, and strategic alignment. These dimensions are incorporated into the conceptual model of this study and are considered the foundation for assessing the critical factors of hospital readiness for LSS adoption in the Palestinian context.

2.6.2 JCI Accreditation and Hospital Readiness to Adopt LSS

Hospital accreditation, by international bodies such as the JCI, is increasingly recognized as a driver for conducting and adopting quality improvement initiatives like LSS (Tomblin, 2021). Accreditation sets and provides the healthcare organizations with standards, accountability mechanisms, and operational benchmarks that are aligned with LSS goals, like CQI, process efficiency, and better patient outcomes

Khan (2020) found that by enhancing clinical procedures, infrastructure, and service reliability in various departments such as emergency, pharmacy, laboratory, and outpatient care, accreditation programs like JCI, was found to greatly enhance hospital performance. The application of evidence-based approaches like LSS was facilitated by these procedural and structural advancements.

Stronger leadership engagement, effective communication systems, and more systematic evaluation procedures are frequently found in accredited hospitals (Khan, 2020; Tomblin, 2021; Hussein et al., 2021; Zabin et al., 2024). These elements match the

conceptual model factors of readiness of this study, including evaluating the current process, management commitment, and resource and infrastructure.

Hospitals with accreditation likely have strong infrastructure and are more familiar with internal audits, documentation procedures, and standards of quality (Alhawajreh et al., 2023; Tomblin, 2021). These hospitals' operational strengths make it easier to utilize quality improvement tools like DMAIC and root cause analysis.

This relationship was noted in a cross-sectional study that was conducted at An-Najah National University Hospital (NNUH), one of the few hospitals that has JCI-accreditation in Palestine. Zabin et al. (2024) study reported that after accreditation, nurses perceived that there were improvements in quality of care provided, patients satisfaction, and safety. Leadership commitment, employee engagement, strategic planning, and quality management which resembled LSS readiness dimensions were predictors of these results. Their regression analysis verified that staff engagement and performance monitoring greatly influenced these improvements.

Tomblin's (2021) systematic review on the effects of JCI accreditation supports this as it noted benefits like improved documentation procedures, increased staff involvement, and reduce length of hospital stay. This review points out that there is limited data regarding if accreditation lower rates of infection, mortality, and patient satisfaction. He emphasized that accreditation creates supportive culture for quality-driven changes like LSS, but it alone may not improve all clinical outcomes directly.

In a review of 76 studies conducted by Hussein et al. (2021), similarly, they confirmed that accreditation enhances the culture of safety and process efficiency while the effect of accreditation on mortality and patient-reported outcomes is inconclusive. This review emphasizes that more research is needed in order to assess the relationship between accreditation and performance improvement.

The Wijaya and Alfarizi (2024) study also supported this; it showed that teaching hospitals' service quality improvement improves when combining efficient hospital governance with accreditation procedures like JCI. Their study utilized Partial Least Squares Structural Equation Modelling (PLS-SEM) and found that internal capacity development, quality adherence, and strategic alignment are crucial factors that ease readiness for large-scale improvement models.

Finally, accreditation can be used as a moderating variable between readiness factors and successful LSS implementation. The accredited hospital may be better equipped to implement LSS, even when two hospitals have similar or comparable levels

of or leadership support or staff training on structured standards, documentation, and performance protocols (Zabin et al., 2024; Tomblin, 2021; Hussein et al., 2021).

In summary, JCI accreditation serves as a marker of quality compliance and helps to enhance institutional capacity and readiness for change. It strengthens the cultural and structural underpinnings to adopt transformational models like LSS. This study accounts accreditation to be a potential moderator that reinforces the pathway from organizational cultural readiness to successful implementation of LSS.

2.6.3 Readiness for LSS in Developing and Low-Resource Contexts

The adoption of LSS in healthcare systems within developing and low-resource nations involves a variety of challenges, influenced by inadequate infrastructure, limited resources, and contextual obstacles. In high-income countries, LSS has shown a remarkable success in improving the delivered services and effectiveness of healthcare, but for in low- and middle-income contexts there are systemic and organizational issues that directly affect hospital's readiness to adoption (Albliwi et al., 2014).

The shortage of adequate financial and human resources is considered to be one of the main issues that hinder effective adoption. It is challenging to specify the needed time and resources to quality improvement projects in hospitals in many developing nations mainly because of financial constraints, low staffing, and high patient loads (Pain et al., 2024).

Furthermore, many healthcare organizations are unable to conduct the data-driven analyses that are essential to LSS methodologies because reliable data systems are unavailable or inaccessible (Albliwi et al., 2014).

Hierarchical management structures and resistance to change in the cultural context are also major challenges because without strong leadership, frontline employees may resist implementing new procedures (Albliwi et al., 2014). Comparable cases have been observed in adjacent regions, where a lack of understanding of LSS principles among staff and insufficient support from leadership impede hospital preparedness for LSS (Ismail & Mohamed, 2024).

Despite these obstacles, there are many success factors found with similar environment like the West Bank. Collaborations with international organizations and NGOs have facilitated training and provided resources, which have offered some technical assistance to address systemic deficiencies. Along with hospital leadership

engagement in fostering a flexible work culture that can deal with political or economic challenges (Sharikh et al., 2019).

When LSS is implemented, it's important to have organizational contextual adaptation, as shown by the lessons learnt from these situations. It might not be applicable to utilize the tools such in high-resource environments; instead, a well- tailored, a more culturally related, and appropriate method to achieve sustainability and acceptance is advised. In order to improve readiness, it is crucial to connect LSS programs with critical healthcare problems, develop informal leadership at all organizational levels, and build local capacity through ongoing staff training (Albliwi et al., 2014; Ismail & Mohamed, 2024).

Ultimately, the readiness for LSS in developing countries depends on technical capacity and on the ability to create a supportive organizational culture, leadership commitment, and linking initiatives with local priorities and constraints.

2.7 Conceptual Framework and Hypothesis Development

The conceptual framework underpinning this study is informed by key theories in implementation science and organizational change, with a particular emphasis on Weiner's (2009) Organizational Readiness for Change model and the Texas Christian University Organizational Readiness for Change (TCU ORC) framework. Both models highlight that readiness for change is shaped by two core elements: the psychological commitment of employees within the organization and the institution's overall capability to implement change effectively. Within the context of LSS in healthcare, organizational readiness reflects a hospital's preparedness to adopt, implement, and sustain quality improvement initiatives.

Drawing from a comprehensive review of relevant literature and empirical research, this study identifies six key independent variables that are hypothesized to influence a hospital's readiness to implement LSS: Management Commitment and Leadership, Organizational Culture, Training and Education, Communication and Collaboration, Availability of Resources and Infrastructure, and Evaluation of Current Processes and Systems. Each of these dimensions is expected to have a direct relationship with hospital readiness for LSS, as outlined in the research hypotheses (see Table 1.2).

More specifically; H1 posits that strong management commitment and leadership has a pivotal effect in enhancing readiness for LSS. Leaders who prioritize quality

improvement, allocate appropriate resources, and actively champion LSS initiatives are more likely to foster a supportive environment for successful implementation.

Moving to H2 which suggests a supportive organizational culture, characterized by shared values, norms, and a commitment to continuous improvement, positively influences readiness for LSS. Furthermore, H3 argues that targeted training and education efforts contribute to readiness by equipping staff with the knowledge and skills necessary to engage effectively with LSS methodologies.

H4 proposes that effective communication and collaboration across departments facilitate readiness by ensuring transparency, alignment, and coordinated efforts. While H5 states that the availability of adequate resources and supporting infrastructure is essential for operationalizing LSS practices and sustaining them over time. The last direct path is represented by H6 asserts that systematically evaluating current processes encourages a data-driven mindset, which aligns with the goals of LSS and enhances organizational readiness.

In addition to these direct relationships, the framework incorporates a mediating variable, staff perceptions and awareness, to capture the influence of staff understanding on the preparedness of LSS implementation. H7 hypothesizes that employee awareness of the potential impact of LSS mediates the relationship between training and education and overall readiness. When staff members understand the value and benefits of LSS, they are more likely to support and engage with quality improvement efforts, thereby amplifying the impact of educational initiatives.

Lastly, the framework introduces JCI accreditation as a moderating variable; H8 proposes that accreditation strengthens the relationship between organizational culture and readiness for LSS. Institutions with recognized accreditation are assumed to have more structured processes and a culture of continuous improvement, which may reinforce the positive effects of organizational culture on readiness. Accredited hospitals, being more familiar with structured quality standards, may leverage organizational culture more effectively to drive readiness.

Additional hypotheses address comparative and correlational aspects: H9 explores differences in awareness across demographic groups, while H10 examines associations among the study constructs.

This conceptual framework not only informs the development of the survey instrument but also guides data analysis and interpretation. By empirically testing these

hypothesized relationships, the study aims to provide evidence-based insights to support strategic planning for sustainable LSS adoption in hospitals within the West Bank.

A visual illustration of the framework is provided in Figure 2.1, clarifies the direct, mediating, and moderating pathways hypothesized in the study.

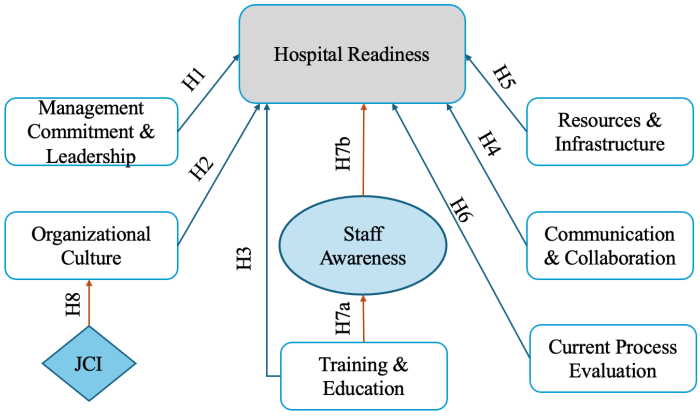

Figure 2.1: Research Conceptual Framework

2.8 Research Philosophy

As outlined in the research onion model in Figure 3.1, the choice of research philosophy forms the outermost layer of the research design and guides all subsequent methodological decisions. Research philosophy, as defined by Saunders et al. (2007), refers to "the development of research assumptions, its knowledge, and nature." It encompasses the varying assumptions that researchers hold about knowledge, shaped by their perspectives on its application in the study. In the context of scientific research, philosophy is a framework that allows researchers to convert abstract ideas into structured knowledge (Žukauskas et al., 2018).

The major research philosophies commonly identified in academic literature include positivism, interpretivism, pragmatism, and realism. Each philosophy has distinct assumptions about the nature of knowledge and how it can be acquired. In this study, the positivist research philosophy is primarily adopted, which assumes that causes (in this case, readiness key factors) determine outcomes (hospital readiness to implement LSS).

The postpositivist worldview is considered the traditional approach to research, particularly relevant to quantitative studies. The positivist philosophy involves a structured data collection process designed to assess the support for the related theory,

followed by hypothesis testing and statistical analysis to validate the findings ensuring its reliability (Creswell & Creswell, 2018, pp. 54-55).

Positivism emphasizes empirical observation and measurement, asserting that reality can be understood through objective, scientific inquiry. This approach is particularly fitting for this study, which involves quantifiable data related to hospital readiness (Creswell & Creswell, 2018, pp. 54-55).

2.9 Research Gaps and Justification for the Study

Despite the growing global emphasis on quality improvement in healthcare, there remains a notable lack of empirical research focused on LSS within the Palestinian healthcare system. Most studies in Palestine concentrate on broader quality initiatives such as accreditation, ISO certification, and TQM, leaving a significant gap in our understanding of LSS-specific applications. As such, there is an urgent need to explore how LSS, an integrated methodology proven to enhance efficiency and patient care, can be effectively understood and applied in Palestinian hospitals.

The reviewed literature highlights that most LSS-related initiatives in Palestine are limited to isolated, project-based interventions, such as improving patient flow, enhancing checklist adherence in surgery, or optimizing packaging processes in the pharmaceutical sector. While these studies report localized improvements, they lack a comprehensive evaluation of organizational readiness for broader LSS adoption across the healthcare system.

Another critical gap is the absence of data regarding healthcare staff's perceptions and awareness of LSS. Current literature does not provide adequate insight into how familiar clinical and non-clinical staff are with LSS concepts, tools, or benefits. Furthermore, there is no comprehensive assessment available that examines awareness levels across different hospital departments such as pharmacy, nursing, or laboratory services. This lack of foundational knowledge severely limits the potential for successful LSS adoption and implementation.

Moreover, existing research is predominantly descriptive or operational in nature, focusing on specific tools or processes rather than examining the underlying readiness factors that determine whether an institution is positioned to successfully adopt and sustain LSS. There is also limited exploration of contextual moderators (e.g., accreditation status) and mediators (e.g., staff awareness) that influence LSS

effectiveness in this setting. Although organizational readiness has been extensively studied in various sectors, its application to LSS in the Palestinian healthcare context remains unexplored. Existing readiness frameworks have not been adapted or validated locally, raising concerns about their relevance and effectiveness in the unique sociopolitical and economic environment of Palestine. Understanding whether hospitals are structurally and culturally prepared for LSS implementation is essential before any practical steps are taken.

Additionally, while studies have touched upon leadership, training, infrastructure, and quality culture as important themes, few have integrated these into a solid framework to evaluate their collective impact on LSS readiness. The lack of empirical models using robust analytical techniques, such as structural equation modeling, further limits the generalizability and strategic utility of past findings. Elements such as leadership support, staff training, availability of resources, and institutional culture are often cited as essential in global literature, yet their significance within Palestinian healthcare institutions are not well understood. Furthermore, local cultural, economic, and political conditions that may impact readiness have not been adequately examined, creating a significant blind spot in policy and practice.

This lack of integration is also evident at the policy level, where national healthcare strategies and plans seldom mention LSS or its methodologies. This oversight has contributed to a disconnect between theoretical models of quality improvement and their actual implementation on the ground. Without strategic alignment, LSS initiatives risk being ad hoc and unsustainable. Moreover, few structured LSS education or certification programs are available to healthcare professionals in Palestine. The limited access to such training significantly hinders the development of internal capacity needed to lead and sustain LSS-driven improvement efforts.

This study addresses these gaps by developing and testing a structured model of hospital readiness for LSS implementation in the West Bank, alongside identifying and quantifying the influence of key readiness factors (e.g., leadership, training, culture, communication, infrastructure). Additionally, examining the mediating role of staff awareness and the moderating role of JCI accreditation, and contributing empirical evidence using PLS-SEM, which has been largely absent in the regional literature.

Given these gaps, this study aims to address the urgent need for a contextual understanding of LSS awareness and organizational readiness within Palestinian hospitals. By doing so, it will contribute valuable insights for both practice and policy,

ultimately supporting more effective and sustainable quality improvement in the healthcare sector.

2.10 Chapter Summary

This chapter comprehensively reviewed the existing literature on LSS adoption and readiness in healthcare, emphasizing both global and regional contexts, including the West Bank. The review identified six critical factors influencing hospital readiness for LSS implementation: Management Commitment and Leadership, Organizational Culture, Training and Education, Communication and Collaboration, Availability of Resources and Infrastructure, and Evaluation of Current Processes and Systems. Studies consistently highlight leadership engagement and a supportive culture as foundational to successful LSS adoption, while resource limitations and low staff awareness present significant barriers, especially in developing settings. Furthermore, accreditation (e.g., JCI) emerged as a potential enabler, strengthening organizational structures and quality systems that support readiness. Gaps in staff knowledge and limited empirical research on readiness in the Palestinian healthcare system were also evident, underscoring the need for tailored interventions.

The insights from the literature directly informed the study's conceptual framework and research hypotheses by identifying key readiness factors that predict hospital readiness for LSS adoption. By synthesizing empirical and theoretical findings, the review established a rationale for exploring these factors in the Palestinian context and justified the inclusion of mediating (knowledge and awareness) and moderating (JCI accreditation) variables. Additionally, the literature gaps highlighted; such as the absence of localized readiness assessments and limited data on staff perceptions, shaped the study's objective to develop and empirically test a readiness model special to Palestinian hospitals.

Building on the literature review’s findings, the next chapter will outline the research methodology employed to empirically investigate hospital key readiness factors for LSS implementation in the West Bank. It will describe the study design, population, sampling strategy, data collection tools (including the survey instrument aligned with the conceptual framework), and statistical analysis methods, notably the use of PLS-SEM to test the hypothesized relationships. This methodological strategy integrates theoretical understanding with empirical strength, ensuring a balanced and robust foundation for the

research aiming to address the identified literature gaps and provide actionable recommendations.

Chapter Three: Research Methodology

3.1 Overview

Chapter three provides an in-depth explanation of the study philosophy and offers a rationale for the chosen methodology to achieve its aims and objectives. This chapter covers the research design, philosophy, strategy, survey instruments, and data collection methods. Building on the research framework introduced in chapter two, it elaborates on the selection of variables and the data analysis techniques, including the quantitative approach using PLS-SEM. Finally, the chapter addresses the ethical considerations and highlights the study's limitations.

The study design will be discussed in the next section to provide a comprehensive detail about the research adopted methodology.

3.2 Research Design

This study employed a quantitative, cross-sectional, descriptive–explanatory research design to investigate healthcare staff awareness and readiness for LSS implementation in the Palestinian healthcare sector. The design was chosen to allow for both the description of current perceptions of LSS principles and the examination of relationships between key readiness factors, as outlined in the conceptual framework.

The research process was guided by the "research onion" model proposed by Saunders et al. (2009), which informed the selection of the research philosophy, approach, strategy, and time horizon most suited to the study objectives (Figure 3.1).

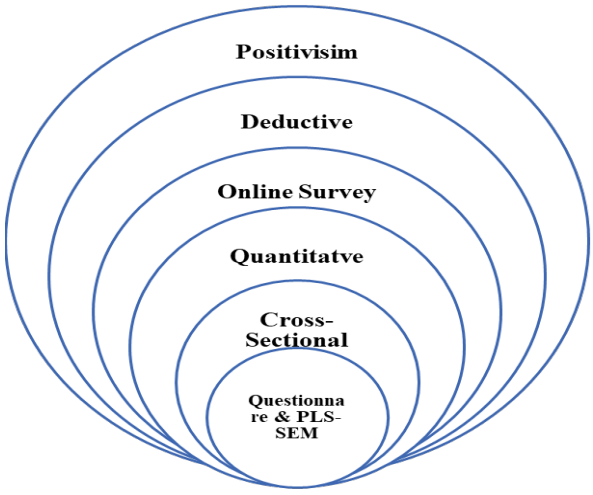

Figure 3.1: The Study Research Onion

Source: Adapted from (Saunders et al., 2009) with author's modification

Data were collected using a structured, self-administered questionnaire distributed to staff from managerial and medical departments in selected hospitals. A convenience sampling technique was used to ensure the inclusion of participants with relevant knowledge and responsibilities.

The data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM), enabling the assessment of both measurement and structural models, including mediation and moderation effects. This design was considered appropriate for addressing the study's aims, as it supported systematic measurement, hypothesis testing, and the generation of practical insights to guide LSS adoption in healthcare settings.

3.3 Research Approach

Research approaches refer to the strategies and procedures that guide the research process, extending from general assumptions to specific methods for data collection, analysis, and interpretation. Research approach determined primarily by the nature of research problem regarding the issue of interest (Creswell & Creswell, 2018, pp. 51-52).

Based on the research questions outlined earlier in this chapter, the study objectives, and the quantitative nature of the collected data, a deductive approach is employed. This approach begins with pre-stated hypotheses that are tested through data collection to either confirm or reject them. There are three primary research approaches: [a] qualitative, [b] quantitative, and [c] mixed methods. In a quantitative study, the researcher typically explains the problem by identifying the relationships between variables and research outcome. Moving to comprehensive literature review that aids in addressing questions and formulating hypothesis for testing (Creswell & Creswell, 2018, pp. 51-52).

\For this study, a quantitative approach was employed, utilizing hypothesis testing to examine the associations between study variables. Primary data on the key readiness factors influencing hospital implementation of LSS principles were collected through a structured questionnaire, which was distributed electronically.

3.4 Research Strategy

The purpose of the survey research is to generalize a quantitative description of observed sample patterns, mindsets, or thoughts to a population. Depending on the time horizon, it includes cross-sectional and longitudinal studies utilizing questionnaires or structured interviews for data collection (Fowler, 2009). Table 3.1 illustrates how the author aligns the research objectives to the research strategy.

Table 3.1: Alignment of research objectives to research strategy

Research Objectives	Research Methodology	Research Methods	Analysis Method
To identify the key factors that affect the readiness of hospitals in West Bank to implement LSS principles effectively	Quantitative	Literature review, Survey	PLS-SEM
To assess the extent of perceptions and awareness among hospital staff in West Bank, both governmental and private, regarding the principles of LSS	Quantitative	Survey	Descriptive
To evaluate whether JCI Accreditation enhances the readiness level of hospitals for LSS implementation	Quantitative	Survey	PLS-SEM

Source: Author's effort. PLS-SEM: Partial Least Squares Structural Equation Modeling, JCI: Joint Commission International.

3.4.1 Cross- Sectional Study

A cross- sectional design was employed to collect data from the employees in the West Bank hospitals at a single point in time in a period (5th Dec 2024 to 6th Jan 2025). This design is suitable with the study objectives of identification of the key factors that affect the readiness of hospitals in West Bank to implement LSS principles effectively, besides the ease of data collection process. Additionally, the study will inform the level of staff' perceptions and awareness of LSS methodologies which explain the compliance of its principles if implemented.

3.5 Data Collection Method

The selected method for data collection must align with research objectives while remaining consistent with the study design and philosophical framework, ensuring the reliability and accuracy of the outcomes. Convenience sampling was employed, selecting participants based on their job title, availability, and willingness to participate. A self-administered, well- structured questionnaire was utilized to explore the key factors affecting the implementation of LSS principles in hospitals across the West Bank. This section outlines the tools, procedures, and strategies employed in data collection, ensuring they are aligned with the study's overall methodology.

3.5.1 Data Collection Tool

Several types of questionnaires can be used to collect data, although the interviewer questionnaire may provide better respondents' understanding, it was difficult to apply in the data collection period for many reasons. Therefore, a self-administered online questionnaire was selected for this study. Using this form offers several advantages over others. Firstly, it allows respondents to take their time to fill in which can improve the response rate (Saunders et al., 2009). Another important advantage is it is both cost-effective and quick. However, some difficulties arise using self- administered online form which summarized in low response rate and concerns about the accuracy of the collected data. To encounter these issues, the author implemented several strategies like personal acknowledges, sending encouragement e-mails and messages to respondents to increase participation. Additionally, the questionnaire was designed with a variety of question types and formats to enhance data accuracy. The final questionnaire used for the study is attached in appendices A and B.

3.5.2 Questionnaire Design and Outline

To ensure comprehensive assessment of hospital readiness for LSS implementation, the study questionnaire was developed based on literature review and adapted to reflect core domains of organizational change readiness. Notably, the structure and content of the instrument align with the conceptual framework of the TCU ORC model (Institute of Behavioral Research, 2005). While not adopting the TCU ORC tool item-for-item, the questionnaire covers its four major domains: motivational readiness for change,

institutional resources, staff attributes, and organizational climate. Sections related to management commitment, organizational culture, resources and infrastructure, staff perceptions and awareness, and collaboration effectively capture these dimensions in the context of LSS. This alignment supports the instrument's content validity and strengthens its relevance for assessing readiness factors in the healthcare setting.

The questionnaire is structured into five parts each designed to assess the exact purpose. The first part focuses on sociodemographic characteristics that identify the sample utilizing multiple choice questions. Moving to part two which is divided into two sections aimed at assessing staff perceptions and awareness regarding LSS principles. Section one includes items with multiple choice questions to measure the familiarity with LSS extent while the five-point Likert's scale is employed in section two which ranges from 'strongly disagree' to 'strongly agree', to evaluate staff awareness of LSS impact.

Part Three addresses readiness factors for LSS implementation, using a five-point Likert scale to measure agreement regarding the independent variables: management commitment and leadership, organizational culture, training and education, resources and infrastructure, communication and collaboration, and evaluation of current processes.

A descriptive style with closed-ended, multiple choice questions exploring perceived challenges and enablers to LSS implementation are component of part 4. Finally, part five invite participants to provide comments or suggestions regarding hospital readiness for LSS implementation. Table 3.2 presents the outline of the questionnaire, detailing the different question types and their respective purposes.

Table 3.2: Questionnaire Outline

Part #	Part		Purpose	Question structure
1	Sociodemographic Characteristics		To filter hospitals according to specific variables	Closed-ended, multiple choice questions
2	Perceptions & Awareness assessment	Section1: LSS Perceptions Assessment	To investigate the extent that staff are familiar with LSS	Closed-ended, multiple choice questions
		Section2: Awareness of LSS Impact	To assess the awareness of LSS	Closed-ended, Likert scale: 1-5

			impact among hospital staff	
3	Readiness Factors for LSS Implementation		To identify the key factors that affect the readiness of hospitals to adopt LSS	Closed-ended, Likert scale: 1-5
4	Perceived challenges and enablers to LSS implementation		To rank the perceived challenges and enablers to LSS implementation	Closed-ended, multiple choice questions
5	Optional Data		To ask respondents if they want to share their comments or suggestions regarding the readiness for LSS	Open-ended

Source: Author

3.5.3 Questionnaire Assessment

3.5.3.1 Questionnaire Content Validity

This section is dedicated to ensuring the validity of the research instrument employed in this study. Validating the questionnaire content is crucial for assessing the appropriateness of measurement items and constructs. Content validity aims to identify potential misunderstandings or biases stemming from the wording or implications of the questions. A robust research instrument must include items and attributes that adequately cover all study variables, ensuring that the data collected is both representative and reliable (Sekaran & Bougie, 2016, pp. 220-221).

Although questionnaires adopted from previous studies are generally considered valid, a review from panel of experts for the content of the instrument to propose modifications that would further enhance its validity is needed. In this study, most

questionnaire items were derived from prior peer-reviewed studies focused on measuring knowledge and awareness of LSS principles, as well as the readiness factors for LSS implementation. Appendix C provides a detailed outline of the questionnaire content, linking each item to its corresponding source.

To ensure comprehensive validation, three experts in the fields of quality management and Lean/Six Sigma principles were consulted. Their practical and academic expertise proved invaluable in refining the instrument, particularly in terms of wording, item relevance, design, and the sequencing of questions. Their feedback facilitated necessary adjustments to enhance the questionnaire's clarity and effectiveness. The details of the experts who evaluated the questionnaire are included in Appendix D.

While the original questionnaire did not include a dedicated section explicitly labeled as "Readiness Level", the construct was assessed post hoc by identifying and extracting specific indicators from multiple constructs that conceptually aligned with the dimensions of readiness. These items were carefully selected based on their relevance to organizational preparedness for LSS implementation and were validated during the measurement model assessment in SmartPLS. Although not pre-structured as a distinct block, the selected items demonstrated sufficient convergent validity and internal consistency to serve as a reliable latent construct representing readiness.

3.5.3.2 Questionnaire Reliability

Measurement model evaluation (outer model assessment) is considered one of the most detailed and critical steps in the validation process. Its purpose is to confirm that the collected data is both reliable and valid, serving as a solid foundation for subsequent analyses.

Measurement models represent the conceptual frameworks that define the relationship between latent variables and their observed indicators. These models explore whether the latent variable is influenced by its indicators (causal indicators) or whether it underlies and determines the observed indicators (effect indicators), as outlined by Bollen and Lennox (1991).

3.5.3.2.1 Reliability and Convergent Validity

Coefficient of reliability is a measure of the ratio of true variance to the total observed variance resulting from the application of a measurement protocol (e.g., a test,

scale, expert assessment, etc.) to a group of individuals. To estimate the reliability of a test score, one needs at least two observations (scores) on the same group of individuals. The correlation between the sets of observations provides a reliability coefficient. From this simple requirement, a variety of reliability studies can be designed, such as test-retest reliability, internal consistency reliability (Cronbach, 2004), split-half reliability (Feldt & Brennan, 1989), Cronbach's alpha reliability (Allen & Yen, 2002), and many others. The above tests are commonly used as measures of internal consistency or the reliability of a psychometric test score across a sample of examinees, and are widely used in the social sciences, business, nursing, and other disciplines.

Reliability testing was used in this study to establish reliability indices and ensure internal consistency among items within variables. This test uses two factors; Cronbach's alpha and composite reliability. According to Hair et al. (2017), Cronbach's alpha and composite reliability must be above 0.7 to be accepted.

In the context of classical test theory, the Average Variance Extracted (AVE) measures how much variance the observed variables explain in the underlying construct, compared to the attributes of variance measurement error. The AVE plays a key role in supporting construct validity for data reliability as well as validity are verified. The Fornell-Larcker criterion is another tool that is used with it. AVE generally requires a threshold value of 0.5 or above to be acceptable (Hair et al., 2017, p 184).

To assess reliability and convergent validity of the study reflective constructs, outer loadings, Cronbach's alpha, composite reliability (CR rho_a), and average variance extracted (AVE) were examined and viewed in Table 3.3. Most of the reflective indicators exhibited satisfactory outer loadings; except RL1 and RL5 that will be retaining based on AVE and due to its strong theoretical relevance and contribution to the construct's conceptual integrity; with values exceeding the recommended threshold of 0.70.

Based on Table 3.3, the results showed high internal consistency with Cronbach's alpha and composite reliability values. The variables (Awareness of LSS impact, Training and Education, and Readiness Level) achieved Cronbach's alpha values of 0.941, 0.848, and 0.872 respectively. Additionally, AVE values were above 0.50 for all constructs, indicating adequate internal consistency and convergent validity. Thus, the measurement model satisfies the requirements for reliability and convergent validity.

Table 3.3: Outer Model Assessment (Reflective)

Construct	Indicator	Outer Loading	Cronbach's Alpha	Composite Reliability (rho_a)	AVE	Decision
Awareness of LSS Impact (AA)	AA1	0.868	0.941	0.961	0.808	Accept
	AA2	0.949				Accept
	AA3	0.900				Accept
	AA4	0.835				Accept
	AA5	0.938				Accept
Training and Education (TE)	TE1	0.756	0.848	0.856	0.620	Accept
	TE2	0.815				Accept
	TE3	0.796				Accept
	TE4	0.765				Accept
	TE5	0.802				Accept
Readiness Level (RL)	RL1	0.629	0.872	0.878	0.531	Retain
	RL2	0.737				Accept
	RL3	0.741				Accept
	RL4	0.733				Accept
	RL5	0.651				Retain
	RL6	0.856				Accept
	RL7	0.713				Accept
	RL8	0.747				Accept

3.5.3.2.2 Discriminant Validity

Discriminant validity checks constructs if they remain unrelated though distinct. This ensures that each construct within the model measures one unique concept and will not overlap to a large extent with the others.

In their work on test validity, Campbell and Fiske (1959) initially presented the concept of discriminant validity during their development and validation. They highlight that a construct which is not overly correlated with others measuring different theoretical concepts shows a strong discriminant validity test of it.

Like the sequential convergence test, discriminant validity verifies the distinctiveness of constructs inside a model and offers an alternative to customary

correlation assessments. Hair et al. (2019) state discriminant validity has support if the square root from each construct's AVE goes over its correlations to other constructs.

In this study, discriminant validity was evaluated using both the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT). According to the Fornell-Larcker results shown in Table 3.4, the square root of the AVE for each reflective construct exceeded its correlations with other constructs, indicating satisfactory discriminant validity. Additionally, all HTMT values (see Table 3.5) were below the conservative threshold of 0.90, confirming that each construct is empirically distinct from the others in the model.

Table 3.4: Fornell- Larcker Criterion Test

	AA	TE	RL
AA	0.899		
TE	0.441	0.787	
RL	0.419	0.764	0.729

RL: readiness level, TE: training and education, AA: awareness of LSS impact.

Table 3.5: Heterotrait-Monotrait (HTMT) ratio

	AA	TE	RL
AA		0.442	0.456
TE	0.442		0.867
RL	0.456	0.867	

RL: readiness level, TE: training and education, AA: awareness of LSS impact.

3.5.3.2.3 Collinearity and Outer Weights (Formative Constructs)

Multicollinearity occurs when predictor variables in a regression model are highly correlated, which can distort the estimation of regression coefficients and reduce the interpretability of the model. It implies that one independent variable can be linearly predicted from the others with a substantial degree of accuracy. To detect multicollinearity, researchers often examine correlation matrices and rely on specific diagnostic statistics.

Variance Inflation Factor (VIF) values were used to assess multicollinearity among indicators in formative constructs. All VIF values presented in Table 3.6 were below the recommended threshold of 3.3, indicating no significant multicollinearity issues. This

confirms that the indicators contribute uniquely to their respective constructs and support the formative measurement model structure. While some indicators exceeded 3.3, they remained below the critical threshold of 5 and were retained due to theoretical relevance (Hair et al., 2019).

Table 3.6: Outer Weights (Formative Constructs)

Construct	Indicator	Outer Weights	VIF
Management Commitment and Leadership (ML)	ML1	0.403	1.894
	ML2	0.014	4.031
	ML3	-0.034	3.277
	ML4	0.033	2.086
	ML5	0.635	2.600
	ML6	0.225	1.707
	ML7	-0.124	1.969
	ML8	0.032	2.761
Organizational Culture (OC)	OC1	0.219	2.494
	OC2	0.241	2.332
	OC3	0.169	3.701
	OC4	0.386	3.305
	OC5	0.165	1.387
Resources and Infrastructure (RI)	RI1	0.106	2.263
	RI2	0.045	2.870
	RI3	0.247	2.782
	RI4	0.470	1.746
	RI5	0.350	2.458
Communication and Collaboration (CC)	CC1	0.327	3.776
	CC2	0.438	4.487
	CC3	0.087	3.545
	CC4	0.136	2.308
	CC5	0.262	1.804
Current Process (CP)	CP1	0.145	1.223
	CP2	0.459	1.804
	CP3	0.574	2.099

3.5.4 Justification for Reflective and Formative Constructs

The measurement model of this study comprises both reflective and formative constructs, selected based on theoretical reasoning and the nature of the indicators. The classification was essential to ensure the validity of results generated through PLS-SEM using SmartPLS.

Reflective constructs assume that the latent variable causes its indicators, which are expected to be interchangeable, highly correlated, and reflective of the same underlying concept. Changes in the construct should lead to changes across all associated indicators. The following constructs were modeled reflectively:

Awareness of LSS Impact (AA): this construct captures the extent to which participants perceive the benefits of LSS (e.g., “LSS reduces waste,” “LSS improves patient satisfaction”). The indicators reflect a shared understanding of LSS's impact and are manifestations of the same latent perception.

Training and Education (TE): indicators relate to employees’ exposure to LSS training and support structures. As all items reflect one unified experience of training quality and availability, TE was modeled as reflective.

Readiness Level (RL): readiness was conceptualized as a latent condition expressed through indicators such as staff preparedness, management support, and resource alignment. These manifestations are correlated and interchangeable, aligning with reflective model logic. Removing one item would not significantly alter the construct's meaning. Validity of this specification was supported through convergent and discriminant analysis in the results chapter.

Formative constructs are defined by their indicators, which represent distinct dimensions or components. These indicators are not necessarily correlated and are not interchangeable and each contributes uniquely to the meaning of the construct. The following constructs were treated as formative:

Management Commitment and Leadership (ML): includes indicators related to top-level engagement, strategic communication, and investment in LSS activities.

Organizational Culture (OC): composed of indicators related to openness to change, technological adaptability, and emphasis on patient-centered culture.

Resources and Infrastructure (RI): includes diverse elements such as technical skills, leadership knowledge, and access to digital systems, each of which contributes to readiness in a non-redundant manner.

Communication and Collaboration (CC): integrates distinct facets such as team coordination, transparency, and leadership encouragement.

Current Process Evaluation (CP): reflects the organization's practices in monitoring, feedback, and continuous improvement incentives.

This classification (summarized in Table 3.7) reflects the theoretical basis and real-world distinctions among the constructs and ensures that the structural model is correctly specified for robust analysis using SmartPLS.

Table 3.7: Classification of Constructs as Reflective or Formative

Construct	Type	Justification (Brief)
ML	Formative	Distinct indicators like top engagement and strategic communication
OC	Formative	Composed of non-interchangeable indicators (openness, adaptability, etc.)
RI	Formative	Combines distinct elements (digital tools, skills, etc.)
CC	Formative	Integrates separate aspects like transparency and teamwork
CP	Formative	Monitoring, feedback, and improvement incentives
TE	Reflective	Interchangeable items on LSS training exposure
AA	Reflective	Shared perception of LSS benefits
RL	Reflective	Latent trait expressed via correlated items like preparedness and support

RL: readiness level, ML: management commitment and leadership support, OC: organizational culture, TE: training and education, CC: communication and collaboration, RI: resources and infrastructure, CP: evaluation of current processes, AA: awareness of LSS impact.

3.6 Research Settings

This study was conducted in hospitals across the West Bank, Palestine, a region where healthcare institutions face unique challenges in adopting quality improvement methodologies due to limited resources and evolving management practices. The research targeted employees from various hospital departments, including top management, HR, quality department, medical staff, pharmacy, and laboratories, as these groups play a critical role in the implementation of LSS principles.

Hospitals were selected based on their location and size, and the biggest governmental and private hospitals in the north, middle and south of the West Bank were included. Two of them have the JCI Accreditation. Data collected over a specified period through self-administered online questionnaires. The study faced challenges such as low response rates, which were mitigated by follow-up emails and personalized reminders. This research setting provided an opportunity to explore the readiness of healthcare institutions in the West Bank for implementing LSS, contributing valuable insights to both regional and global healthcare management practices.

3.7 Population and Sampling

This section provides a better understanding of study population, unit of analysis and lastly sampling and sample size.

3.7.1 Population

Population is the entire group of individuals or entities that share a specific characteristic that the study focuses on and the researcher planning to draw a conclusion about. In current study, all hospital staff across the West Bank involved or expected to be in the implementation of LSS principles, including top management, human resources personnel, quality department staff, medical officers, pharmacy staff, and lab department staff are defined to be the population. Based on the health annual report (PMoH, 2024), 59 hospitals are in the West Bank, and following the author's selection criteria, the main three biggest hospitals were selected. Table 3.8 explores the details of the selected hospitals; their location, type, number of beds, and the number of workers in both medical and managerial jobs (note; two hospitals were not very collaborative in providing their data).

Table 3.8: Details of Study Hospitals

Hospital Name	Area	Type	# of Beds	# of workers
The Palestine Medical Complex	Middle (Ramallah)	MoH	312	860
Jenin (Khaleel Sulaiman) Hospital	North (Jenin)	MoH	223	457

Princess Alia Hospital	South (Hebron)	MoH	304	580
An-Najah National University Hospital (NNUH)	North (Nablus)	NGO	104	Not applicable
Istishari Arab Hospital (IAH)	Middle (Ramallah)	Private	171	Not applicable

Source: PMoH, (2024)

3.7.2 Unit of analysis

The unit of analysis for this study is the hospitals, as the research investigates the readiness of hospitals in the West Bank to implement LSS principles. Data were collected from hospital staff (e.g., top management, human resources personnel, doctors, and nurses) to gain insights into organizational readiness. While responses were gathered at the individual level, they were aggregated to draw conclusions about readiness factors and challenges at the organizational level.

3.7.3 Sampling Method and Sample Size

Convenience sampling, a non-probability technique, was used to select participants in this study due to time constraints and challenges of accessing the entire target population. While convenience sampling may lack full representativeness, it is suitable for gaining initial insights into LSS knowledge among hospital staff. This method allowed for the efficient collection of data given the study's practical limitations. While purposive sampling might offer a more targeted approach for identifying the key factors influencing hospital readiness to adopt LSS principles, convenience sampling aligns with the exploratory nature and practical constraints of this research.

The participants are the medical or managerial staff including top management, human resources personnel, quality department staff, medical officers, pharmacy staff, and lab department of working in the selected hospitals, others were excluded from the study.

Participation was voluntary, and informed consent was obtained from all participants prior to data collection. Ethical approvals were secured from the Palestinian Ministry of Health as well as the relevant authorities in private and NGO hospitals to conduct the research.

A total of 94 valid responses were obtained and to justify the adequacy of this sample size for the use of PLS-SEM, three recognized criteria were considered.

First, the "10-times rule" suggests that the minimum sample size should be at least 10 times the maximum number of structural paths directed at any endogenous construct in the model (Hair et al., 2017). In this study, the dependent construct Readiness Level is influenced by six predictors (e.g., management commitment, organizational culture, training and education, etc.), resulting in a minimum required sample of 60. The sample of 94 exceeds this threshold.

Second, a power analysis based on Cohen's guidelines (1992) indicates that for detecting a medium effect size ($f^2 = 0.15$) with power = 0.80 and $\alpha = 0.05$, a sample size of 85 is sufficient for a model with up to six predictors. Therefore, the sample size in this study also satisfies conventional power-based requirements.

Third, the minimum R-squared method proposed by Hair et al. (2014, p. 21) was applied. Assuming a minimum R^2 value of 0.25 for the dependent construct, with six predictors, and maintaining a power level of 0.80, the recommended sample size is approximately 70. This was further supported by the power calculation shown in Figure 3.2 (adapted from Hair et al., 2014).

Maximum number of arrows pointing at a construct	Minimum R^2 in the model			
	.10	.25	.50	.75
2	110	52	33	26
3	124	59	38	30
4	137	65	42	33
5	147	70	45	36
6	157	75	48	39
7	166	80	51	41
8	174	84	54	44
9	181	88	57	46
10	189	91	59	48

Figure 3.2: Minimum sample size based on R-squared method (Hair et al., 2014).

Based on these multiple criteria, the final sample size of 94 is considered methodologically sufficient to produce valid and statistically reliable results in the context of PLS-SEM.

3.8 Data Collection

Primary data collection was conducted via an online questionnaire survey, managed and administrated using the Microsoft Forms. The quantitative data collected was obtained from hospital employees working as medical staff and in managerial jobs. The study questionnaire was designed to help reveal the extent of staff knowledge and awareness regarding LSS principles. Another main objective was to explore the key factors that affecting the readiness in the Palestinian's hospitals to deploy LSS methodologies in their daily routines and procedures.

The questionnaire link was sent to the human resources and quality heads departments to be distributed further to the staff. A summary about study objectives and significance was introduced in the questionnaire cover page, with clear instructions to respondents regarding survey questions. Respondents were free to stop participation at any level of the process or complete based on their previous knowledge of LSS and work experience. 94 valid responses were received from participants; detailed explanation of respondents' jobs is shown in Table 3.9.

Table 3.9: Respondents' Response Numbers by their Jobs

Job Title		Team
1	Top Management position	6
2	Head/ officer Human Resources Department	8
3	Head/ officer Quality Department	7
4	Physician	3
5	Resident Doctor	3
6	Nurse	45
7	Laboratory Specialist	12
8	Pharmacist	7
9	Optometrist	2
10	Radiology Technician	1
Total Cohort		94

3.9 Response Rate

Response rate is a significant concern in research, especially with online questionnaires. Although it has several advantages, online surveys accompanied by low response rates (Shiyab et al., 2023). Wu et al. (2022) reported that the average response rate in the online survey is 44.1%, while Nulty (2008) indicated that only 33% of participants typically provide valid online questionnaire. In the fields of human resources and general management, a response rate of 50% is considered acceptable (Mellahi & Harris, 2015). Baruch et al. (2008) found that studies relying on organizational data typically achieved an average response rate of 35.7%. However, it is important to note that increasing the number of participants does not necessarily lead to a higher response rate (Wu et al., 2022).

In the case of LSS studies, which is not yet well-known as a continuous improvement methodology, a response rate of 10% in LSS studies, particularly in developing regions, is considered somewhat acceptable (Albliwi et al., 2017).

To enhance the response rate, many strategies were used by the author. These include 'leverage design' technique, engaging personal contacts to distribute the questionnaire link to hospital staff. Human resources staff and quality heads were approached to encourage employee participation. Finally, weekly reminders were sent via email and LinkedIn to gently prompt potential participants.

3.10 Data Analysis Techniques

In this study PLS-SEM was employed to identify the associations between key readiness factors and the readiness level of the West Bank hospitals to implement LSS. This technique was selected for several reasons. According to Hair et al. (2019), PLS-SEM is a non-parametric technique that does not require data to follow a normal distribution. Given that most of the study variables were measured using ordinal scales (e.g., Likert scales), which may exhibit deviations from normality, PLS-SEM was deemed suitable for this study (Wong, 2013). Additionally, small sample size is an issue in the domain of organizational studies particularly in LSS subjects, PLS-SEM is particularly effective for small sample sizes (Albliwi et al., 2017; Hair et al., 2019).

PLS-SEM is a variance-based approach, which focuses on optimizing the explained variance (R2R^2R2) of dependent variables while minimizing the unexplained variance.

This makes it a powerful tool for identifying relationships between latent constructs in complex models (Hair et al., 2017). The primary structural equation modeling analysis was conducted using SmartPLS version 4 (Ringle et al., 2024), which is well-suited for estimating complex models with latent variables in the absence of normality assumptions. In addition, Statistical Package for the Social Sciences (IBM SPSS Statistics) version 27 was employed for preliminary analyses, including descriptive statistics and data screening procedures.

PLS-SEM was selected due to its suitability for small-to-moderate sample sizes, its ability to handle both formative and reflective constructs, and its focus on prediction and theory development (Hair et al., 2022). Unlike covariance-based SEM, PLS-SEM does not assume multivariate normality, which was confirmed as lacking in the current dataset.

The use of PLS-SEM is further justified by the nature of the measurement model, which incorporates both reflective and formative constructs. As discussed in Section 3.6.4, key constructs such as Management Commitment, Organizational Culture, and Resources were modeled formatively, while constructs like Training and Education, Awareness, and Readiness were modeled reflectively. PLS-SEM was therefore selected for its flexibility in handling complex, mixed-measurement models and its emphasis on prediction-oriented analysis (Hair et al., 2022).

Model evaluation included assessments of validity (e.g., convergent and discriminant validity), reliability (e.g., composite reliability and Cronbach's alpha), and path coefficients using PLS-SEM. A p-value < 0.05 was considered statistically significant, with a significance level of 5% applied to all calculations.

3.11 Ethical Considerations

This study adhered to strict ethical standards, ensuring the privacy, confidentiality, and rights of all participants and hospitals involved. Ethical approval was obtained from relevant Palestinian Institutional Review Boards (IRB). Respondents were informed of the study's purpose in the questionnaire's cover page and the possible benefits were communicated (Saunders et al., 2009). Informed consents from participants and hospitals were obtained as required. All data was treated with confidentiality, securely stored, and used solely for research purposes.

The author complied with Arab American University's ethical guidelines, maintaining transparency and integrity throughout the research. Participants had the

option to withdraw from the survey at any time. No sensitive data was exposed or misused, and no conflict of interest arose during the study. All required approval forms are included in the appendices (E and F).

3.12 Chapter Summary

This chapter outlines the research methodology used to obtain study's objectives. It begins with a detailed explanation of the research philosophy, approach, and design, highlighting the adoption of a positivist paradigm, a deductive approach, and a quantitative research strategy. The rationale for these choices is linked to the study's aim of examining key readiness factors influencing the implementation of LSS in hospitals. The chapter further describes the data collection methods, emphasizing the use of a structured, self-administered questionnaire distributed electronically. The questionnaire design is discussed in detail, and the selection and adaptation of the questionnaire items from previous peer-reviewed studies are elaborated upon, alongside the validation process conducted by a panel of experts to ensure content validity.

The sampling technique and population are also presented, specifying the inclusion of hospitals across the West Bank. Ethical considerations are addressed, including obtaining IRB approval, securing informed consent, ensuring confidentiality, and avoiding conflicts of interest.

Chapter 4: Results

4.1 Introduction

This chapter presents a detailed analysis of the study's findings based on the collected data from 94 valid responses. It includes preliminary analysis, descriptive statistics, and results related to the research hypotheses using PLS-SEM. Key constructs include leadership and management commitment, organizational culture, training and education, communication and collaboration, resources and infrastructure, and process evaluation in relation to hospital readiness for LSS.

4.2 Preliminary Analysis

A preliminary analysis was conducted in this study to clean and prepare the data for further statistical examination. This stage involved two key procedures: an analysis of missing values and a test for normality. Each of these procedures is described in detail below.

4.2.1 Missing Values

Missing values refer to data points that are unintentionally left out during the entry of participants' responses into the statistical software. An examination of the frequency distributions for all study variables revealed that no missing values were present in the dataset.

4.2.2 Normal Distribution Test

Normality tests are statistical procedures for assessing if a dataset follows a normal distribution. For this purpose, several nonparametric methods exist. However, practitioners often rely on more simple approaches, such as visual inspections or with logit comparisons, these approaches may be subjective in nature and require statistical experience. Econometric studies use normality tests more than to direct data analysis, also to confirm if residuals from regression models are distributed normally (Ghasemi & Zahediasl, 2012).

In preliminary analysis, the normality test is used to verify whether or not the data follows a normal distribution. For assessment of the normality of the data distribution, skewness and kurtosis values were examined. Skewness shows the way in which data distribution is asymmetric, while kurtosis reveals the extent to which data are tailed heavily or lightly relative to a normal distribution. Hair et al. (2017, p 76) say skewness values show excellent normality between -1 and +1, while values from -2 to +2 are acceptable. Acceptable values for kurtosis are considered within ±7, especially when regarding structural equation modeling.

Although PLS-SEM does not require multivariate normality, checking these values is still useful for understanding the nature of the data and identifying any potential outliers or data transformations needed. Therefore, skewness and kurtosis were reviewed to ensure that the data distributions were within acceptable ranges for further analysis.

As shown in Table 4.1, all study variables; including Awareness of LSS Impact, Management Commitment and Leadership, Organizational Culture, Training and Education, Resources and Infrastructure, Communication and Collaboration, and Current Processes, demonstrated acceptable levels of normality. Skewness values ranged from -0.696 to 0.149, and kurtosis values ranged from -0.149 to 1.697, indicating that the data meets the assumptions for normal distribution.

Table 4.1: Normality Test Results

Study Variables	Skewness	Kurtosis
Readiness Level	-0.203	1.056
Awareness of LSS impact	-0.170	-0.149
Management Commitment and Leadership	-0.395	1.188
Organizational Culture	0.149	1.186
Training and Education	0.018	1.642
Resources and Infrastructures	-0.230	1.221
Communication and Collaboration	-0.696	1.697
Current Process	-0.360	1.156

4.3 Descriptive Statistics

4.3.1 Sociodemographic Characteristics

Descriptive analysis is a fundamental statistical method used to summarize and interpret the study's variables and themes. It involves reporting frequencies, percentages, means, and standard deviations to provide a clear overview of the data.

In this study, descriptive analysis of the respondents' demographic data serves two primary purposes: (1) to verify that the questionnaire was distributed according to a heterogeneous, randomly stratified sampling method, and (2) to present essential background information about the participants. The demographic profile includes five key categories: gender, age, educational level, job title, and years of work experience.

As presented in Table 4.2, the sample comprised both male and female participants, with 50 males (53%) and 44 females (46%), reflecting a relatively balanced gender distribution. The age distribution was categorized into four groups: 20–24 years, 25–29 years, 30–34 years, and 35 years and above. Participants aged 20–24 constituted 8 individuals (8.5%), while those aged 25–29 accounted for 27 individuals (28.7%). The 30–34 age group included 26 participants (27.7%), and the largest segment comprised individuals aged 35 and above, totaling 33 participants (35.1%). These findings suggest that the majority of respondents were over the age of 30, indicating a more experienced sample overall.

Building on the demographic analysis of age distribution, Table 4.2 shows the educational level of the respondents, which is categorized into four groups: diploma, bachelor's, master's, and PhD. Among the participants, 4 individuals (4.3%) held a diploma, 54 participants (57.4%) had a bachelor's degree, while 32 participants (34%) had a master's degree, and 4 participants (4.3%) had a PhD. These findings indicate that the majority of the respondents (more than half) held a bachelor's degree, while a smaller proportion had higher qualifications.

Following the analysis of age and education levels, Table 4.2 outlines the distribution of participants by job title. Among the respondents, 45 participants (47.9%) held the title of nurse, making this the largest group, followed by 12 laboratory technicians (12.8%), 8 department heads (8.5%), 7 pharmacists (7.4%), and an equal number of 7 from human resources managers or employees. Additionally, 6 participants

(6.4%) were senior management members. The remaining participants were distributed across roles such as resident physician, optometrist, and technical specialist.

Continuing with the demographic analysis, Table 4.2 presents the distribution of participants based on years of work experience. The respondents were categorized into four experience levels: less than 5 years; 33 individuals (35.1%), 19 participants (20.2%) had 6–10 years of experience. 25 participants (26.6%) had 11–15 years, and 17 participants (18.1%) had 16 years or more of experience. These results indicate that more than half of the participants (55.3%) have less than 10 years of work experience.

Table 4.2: Sociodemographic Characteristics

Item	Category	Frequency	%
Gender	Female	44	46.8
	Male	50	53.2
Age	20-24 Years	8	8.5
	25-29 Years	27	28.7
	30-34 Years	26	27.7
	≥ 35 Years	33	35.1
Education level	Diploma	4	4.3
	Bachelor's	54	57.4
	Master's	32	34.0
	PhD/Specialist	4	4.3
Job Title	Head/ Officer of Quality Department	8	8.5
	HR Manager/ Employee	7	7.4
	Laboratory Specialist	12	12.8
	Nurse	45	47.9
	Optometrist	2	2.1
	Pharmacist	7	7.4
	Physician	3	3.2
	Radiology Technician	1	1.1
	Resident Doctor	3	3.2
	Top Management position	6	6.4
Experience Years	5 years or less	33	35.1
	6-10 years	19	20.2
	11-15 years	25	26.6
	≥ 16 years	17	18.1

4.3.2 Staff's Perceptions of LSS

In relation to staff perceptions and awareness of LSS, the findings indicate that the majority of participants lacked prior exposure to the methodology. Specifically, 64 respondents (68.1%) reported having no previous knowledge of LSS. In contrast, 21 participants (22.3%) indicated familiarity with LSS, while a smaller proportion reported awareness of it: 6 participants (6.4%) were familiar with Six Sigma, and 3 participants (3.2%) had previous knowledge of Lean thinking. These results suggest a generally low level of perceptions of LSS among hospital staff.

According to the data presented in Table 4.3, most survey participants (88.3%) had not received any formal training in the LSS methodology, which may account for the high percentage of respondents lacking prior knowledge of LSS practices.

Furthermore, over half of the participants (51 individuals, 54.3%) were unsure whether their hospital had implemented LSS. Meanwhile, 24 participants (25.5%) stated that their hospital had not adopted the methodology. Only a small number confirmed implementation: 4 participants (4.3%) indicated that their hospital adopted LSS, 9 participants (9.6%) reported the adoption of Six Sigma, and 6 participants (6.4%) reported the use of Lean thinking.

Table 4.3 reveals that, from the participants' perspective, direct patient care processes, such as treatment and diagnosis, were considered the most suitable areas for implementing LSS. Specifically, 44% of respondents identified these functions as the primary target for LSS application. Indirect patient care processes, like pharmacy and laboratory services, were selected by 30.1% of participants, while 24.1% indicated that support functions, for example, accounting and transportation, were most appropriate for LSS implementation. Additionally, as indicated in the same table, two-thirds of participants (66%) reported being unaware of whether their hospital currently employed LSS initiatives or projects. In contrast, 18 participants (19.1%) confirmed that such initiatives were either in place or had been implemented.

Table 4.3 further shows that nearly three-quarters of participants were unaware of the number of LSS initiatives or projects currently implemented in their hospitals. Only 4 participants (4.3%) reported the existence of one project, 6 participants (6.4%) indicated that there were between two and five projects, and 7 participants (7.4%) stated that no LSS initiatives or projects existed. In terms of perceived benefits, as shown in Table 4.3, more than half of the participants (54.3%) believed that implementing LSS could enhance

quality and reduce errors. Additionally, 19 participants (20.2%) associated LSS with improved patient satisfaction, while 15 participants (16%) highlighted its potential to reduce costs and increase productivity. These findings suggest a general recognition of the benefits of LSS, despite limited awareness or involvement in actual initiatives.

The survey results summarized in Table 4.3 reveal that although 66.0% of respondents (n = 62) reported their hospital holds JCI accreditation, only 5.3% (n = 5) indicated that their hospital employs a LSS expert. Notably, 69.1% (n = 65) of respondents were unaware whether an LSS expert was employed, reflecting limited awareness of LSS resources. Additionally, 25.5% (n = 24) confirmed the absence of an LSS expert in their hospital. These findings suggest that despite a relatively high rate of accreditation, hospitals may lack the specialized expertise and staff awareness necessary to implement LSS effectively, potentially hindering readiness for continuous quality improvement initiatives.

Table 4.3: Assessment of Staff's Perceptions about LSS

Item	Category	Frequency	%
Familiar with LSS	No	64	68.1
	Yes, Lean thinking	3	3.2
	Yes, LSS	21	22.3
	Yes, Six Sigma	6	6.4
LSS Training Received	No	83	88.3
	Yes	11	11.7
Hospital Considered LSS	Yes, Six Sigma	9	9.6
	Yes, LSS	4	4.3
	Yes, Lean thinking	6	6.4
	No	24	25.5
	I don't know	51	54.3
LSS Suited Functions	Direct patient processes	73	44.0
	Indirect patient processes	50	30.1
	Supportive functions	40	24.1
	I don't know	3	1.8
Does your hospital currently have LSS?	No	14	14.9
	Yes	18	19.1
	I don't know	62	66.0
LSS Project Count	0	7	7.4
	1	4	4.3
	2 to 5	6	6.4

	6 to 10	4	4.3
	>10	3	3.2
	I don’t know	70	74.5
LSS Adoption Reason	Improving quality of care/reducing errors	51	54.3
	Improve patient satisfaction	19	20.2
	Cost saving/increasing productivity	15	16.0
	I don't know	6	6.4
	Other	3	3.2
LSS Expert Employed	No	24	25.5
	Yes	5	5.3
	I don't know	65	69.1
JCI Accreditation	No	32	34.0
	Yes	62	66.0

Table 4.4 shows that the most used tool in the participants’ department was control charts, reported by 17 respondents (9.5%). This was followed closely by Failure Mode and Effects Analysis (FMEA), cited by 16 respondents (8.9%). Question codes were used in the results tables for brevity. The full wording of each item is provided in Appendix C.

Table 4.4: LSS Used Tools

Item	Frequency	%
Control charts	17	9.5
FMEA	16	8.9
Cause-effect matrix	15	8.4
ANOVA regression analysis, and/or contingency tables	10	5.6
Value stream map	10	5.6
Hypotheses testing t, z, p and/or X2	9	5.0
5S	8	4.5
Kaizen	8	4.5
Ishikawa diagram	7	3.9
Normality and capability analysis	6	3.4
Visual control	6	3.4
SIPOC diagram	5	2.8

Kanban	3	1.7
Measurement system analysis GR&R	3	1.7
Poka-yoke	3	1.7
Andon	1	0.6
Jidoka	1	0.6
SMED	1	0.6
TPM	1	0.6
None of the above	49	27.4

4.3.3 Awareness of LSS Impact

This section includes five items addressing staff awareness of the impact of LSS. Table 4.5 presents these items along with their corresponding statistical results. A detailed interpretation of the findings and key indicators follows the table.

Table 4.5: Staff Awareness of LSS Impact

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD	Importance	Overall Response
AA4	1	31	49	13	0	3.79	0.69	76%	Agree
AA5	1	1	28	51	13	3.79	0.73	76%	Agree
AA2	1	2	30	49	12	3.73	0.75	75%	Agree
AA1	4	1	34	41	14	3.64	0.90	73%	Agree
AA3	1	2	41	37	13	3.63	0.79	73%	Agree

AA1, AA2, AA3, AA4, AA5 refer to the items of staff awareness of LSS impact, all details are in Appendix C.

Table 4.5 results indicate a generally positive awareness among respondents regarding the impact of LSS in healthcare settings. Across all five statements, participants reported agreement levels ranging from 73% to 76%, with mean scores clustered between 3.63 and 3.79 on a 5-point Likert' scale. The highest agreement was for the statements AA4 "LSS improving patient satisfaction" and AA5 "LSS reducing errors and costs", both achieving a mean of 3.79 and 76% importance, suggesting these are the most recognized benefits. Conversely, the statement AA3 "LSS changes the hospital culture" received the lowest mean (3.63) and importance (73%), indicating relatively less awareness of LSS's influence on organizational culture. The standard deviations (0.69–0.90) show moderate variability in responses, implying some divergence in perceptions

among staff. Overall, these findings demonstrate that while respondents generally acknowledge LSS's benefits, awareness is stronger regarding operational outcomes than cultural transformation.

Figure 4.1 showing the percentage of respondents who either agreed or strongly agreed with each LSS impact statement.

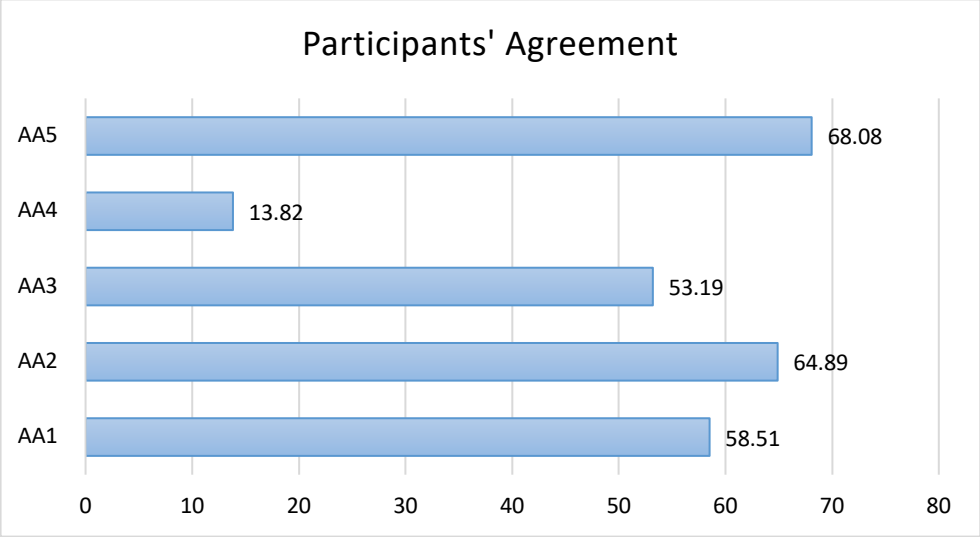

Figure 4.1: Respondents' Agreement with LSS Impact

4.3.4 Hospital Readiness for LSS Implementation

This section includes eight items addressing the hospital readiness for LSS implementation. Table 4.6 presents these items alongside their corresponding statistical results with a detailed interpretation of the findings provided following the table.

Table 4.6: Hospital Readiness for LSS Implementation

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD	Importance	Overall Response
RL3	0	0	23	57	11	3.81	0.68	76%	Agree
RL4	0	7	23	52	12	3.73	0.78	75%	Agree
RL2	2	2	27	56	7	3.68	0.74	74%	Agree
RL5	1	10	28	49	6	3.52	0.81	70%	Agree
RL7	2	13	32	44	3	3.35	0.84	67%	Neutral
RL8	5	21	39	27	2	3.00	0.90	60%	Neutral
RL1	5	16	49	22	2	3.00	0.84	60%	Neutral
RL6	6	16	55	15	2	2.9	0.82	58%	Neutral

RL1, RL2, RL3, RL4, RL5, RL6, RL7, RL8 refer to the items of Hospital Readiness for LSS Implementation, all details are in Appendix C.

According to Table 4.6, the arithmetic means for the items under this axis ranged from 2.80 to 3.81. The item RL6 “The hospital allocated a budget specifically for LSS implementation” recorded the lowest mean score (2.80) with a standard deviation of 0.87, indicating limited financial preparation. In contrast, the item RL3 “There is effective communication between all hospital departments” received the highest mean score (3.81) with a standard deviation of 0.68, reflecting a relatively strong internal communication structure.

A substantial portion of respondents (approximately 50%) selected the neutral option response to statements assessing the hospital’s readiness for LSS implementation. This high level of neutrality suggests a lack of clear perception among staff regarding the hospital’s preparedness for adopting LSS methodologies. This could be due to several factors; limited exposure or understanding of LSS principles and readiness indicators among employees, inadequate communication from leadership about quality improvement strategies or future plans involving LSS, early or uncertain stage of LSS implementation, where formal preparations are not yet visible to the broader workforce, or a general absence of engagement or training, leaving staff unsure about the hospital’s capacity or intent to adopt such initiatives.

This trend highlights a potential gap in organizational awareness and communication regarding strategic quality improvement efforts. It may indicate the need for more robust efforts in educating and involving staff in the hospital's LSS planning and readiness processes to build clarity, confidence, and alignment across departments.

Figure 4.2 exhibits the percentage of respondents who either agreed or strongly agreed with each Hospital Readiness for LSS Implementation statement.

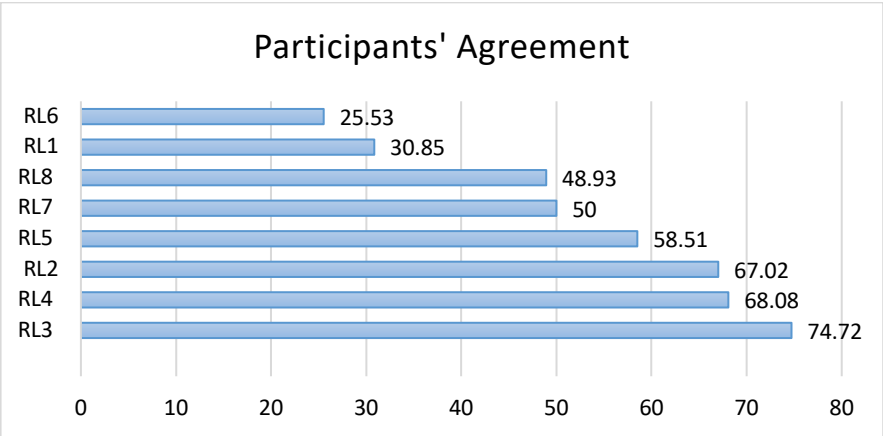

Figure 4.2: Respondents’ Agreement with Hospital Readiness for LSS Implementation

4.3.5 Key Readiness Factors for LSS Implementation

4.3.5.1 Management Commitment and Leadership (ML)

This section consists of eight items focused on management commitment and leadership as a readiness factor to LSS implementation. Table 4.7 presents these items along with their corresponding statistical results. An in-depth discussion of the findings and their implications is presented in the table.

Table 4.7: Management Commitment and Leadership

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD	Importance	Overall Response
ML5	2	5	31	50	6	3.56	0.78	71%	Agree
ML1	3	9	34	41	7	3.43	0.89	69%	Agree
ML8	1	13	31	44	5	3.41	0.83	68%	Agree
ML7	3	11	27	50	3	3.41	0.86	68%	Agree
ML3	3	13	30	41	7	3.38	0.93	68%	Neutral
ML2	4	15	28	43	4	3.30	0.94	66%	Neutral
ML6	2	10	48	29	5	3.27	0.81	65%	Neutral
ML4	6	16	36	33	3	3.12	0.95	62%	Neutral

ML1, ML2, ML3, ML4, ML5, ML6, ML7, ML8 refer to the items of Management Commitment and Leadership, all details are in Appendix C.

Table 4.7 presents the mean scores for the items related to the Management Commitment and Leadership axis ranged from 3.12 to 3.56. The item ML4 “The hospital management builds confidence through good communication between employees and provides incentives for improvement” recorded the lowest mean (3.12) with a standard deviation of 0.95. In contrast, the item ML5 “The hospital management leads and takes responsibility for quality projects and improvement” had the highest mean (3.56) and a standard deviation of 0.78.

Items 4 through 8 showed a relatively higher proportion of neutral responses compared to the other items. However, all mean values exceeded the hypothetical average of 3.00, indicating a general tendency toward agreement among respondents. These findings suggest that participants perceive hospital leadership as generally supportive of quality initiatives, though some uncertainty remains in specific aspects. Overall, there is

a moderate level of perceived management commitment and leadership, which is a critical factor influencing the hospital's readiness to adopt the LSS methodology.

Ultimately Figure 4.3 shows the percentage of respondents who either agreed or strongly agreed with each Management Commitment and Leadership statement.

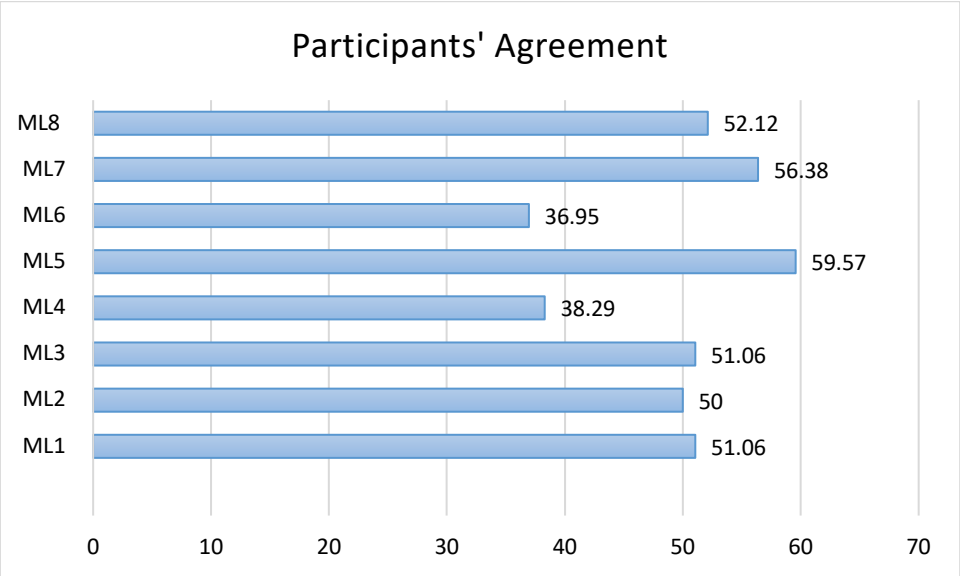

Figure 4.3: Respondents' Agreement with Management Commitment and Leadership

4.3.5.2 Organizational Culture (OC)

Five items that explore aspects of organizational culture related to LSS implementation are included in this section. Table 4.8 presents these items alongside their corresponding statistical results. The subsequent discussion offers a comprehensive interpretation of the results.

Table 4.8: Organizational Culture

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD	Importance	Overall Response
OC3	0	6	20	56	12	3.79	0.75	76%	Agree
OC4	0	6	21	56	11	3.77	0.74	75%	Agree
OC2	1	7	20	53	13	3.74	0.83	75%	Agree
OC1	1	11	28	44	10	3.54	0.88	71%	Agree
OC5	1	12	47	29	5	3.27	0.79	65%	Neutral

OC1, OC2, OC3, OC4, OC5 refer to the items of Organizational Culture, all details are in Appendix C.

As illustrated in Table 4.8, the mean scores for the items in this section ranged from 3.27 to 3.79. The item stating that OC5 "The hospital leadership assigns an oversight expert committee to coordinate the LSS initiatives" recorded the lowest mean (3.27) with a standard deviation of 0.79. In contrast, the item OC3 "The hospital encourages a working environment that emphasizes patient safety" achieved the highest mean (3.79) and a standard deviation of 0.75. Only one item showed a relatively high proportion of neutral responses compared to the others.

The responses related to Organizational Culture showed a predominantly positive trend, with 80% of participants selecting "Agree" and only 20% selecting "Neutral." This suggests a generally favorable perception of the hospital's organizational culture in the context of LSS readiness. The high level of agreement implies that most respondents recognize a supportive cultural environment characterized by openness to change, collaboration, and a commitment to continuous improvement.

The presence of a single neutral response may reflect individual uncertainty or lack of direct experience with cultural aspects, but it does not significantly undermine the overall positive sentiment. These findings indicate that organizational culture is likely to be a facilitating factor in the successful implementation of LSS initiatives. Below, Figure 4.4 with an explanation of respondents' agreement with Organizational Culture.

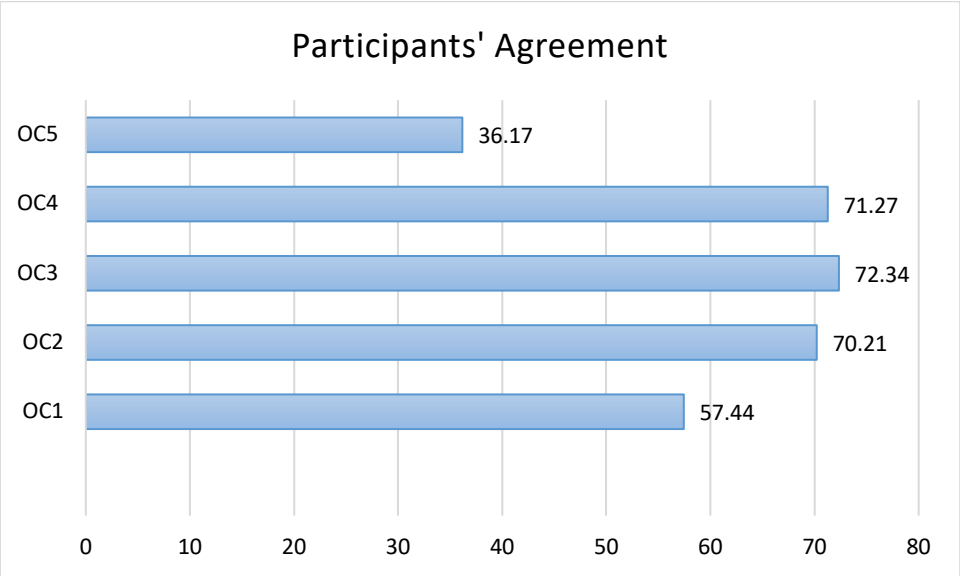

Figure 4.4: Respondents' Agreement with Organizational Culture

4.3.5.3 Training and Education (TE)

This section comprises five items pertaining to training and education. Table 4.9 presents these items along with their associated statistical results, followed by a detailed interpretation of the findings and relevant indicators.

Table 4.9: Training and Education

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD	Importance	Overall Response
TE4	1	6	41	41	5	3.46	0.74	69%	Agree
TE3	4	10	45	31	4	3.22	0.86	64%	Neutral
TE2	3	20	35	34	2	3.13	0.88	63%	Neutral
TE5	3	20	50	17	4	2.99	0.84	60%	Neutral
TE1	7	24	46	15	2	2.80	0.87	56%	Neutral

TE1, TE2, TE3, TE4, TE5 refer to the items of Training and Education, all details are in Appendix C.

Table 4.9 shows that item means in this axis ranged from 2.80 to 3.46. The item TE1 “Hospital staff are aware of LSS principles and their benefits” had the lowest mean (2.80, SD = 0.87), while TE4 “It is understood that LSS is a toolset that helps the hospital achieve business goals while fostering high-performing teams and improving employee satisfaction” recorded the highest (mean = 3.46, SD = 0.74).

The responses to the Training and Education dimension revealed a predominantly neutral stance, with four out of the five items receiving neutral responses, and only one item receiving an "Agree" response. This indicates a general lack of strong opinion or clarity among respondents regarding the hospital’s training and educational efforts in preparation for LSS implementation.

Such a trend may reflect limited exposure to relevant training programs, insufficient communication about available educational opportunities, or a lack of structured capacity-building initiatives related to LSS. The overall neutrality suggests that staff may not yet feel adequately informed, prepared, or engaged through training efforts. This underscores the need for targeted awareness campaigns and competency-building programs to ensure that personnel are equipped with the necessary knowledge and skills to support successful LSS adoption. Figure 4.5 reveals the respondents’ agreement with training and education.

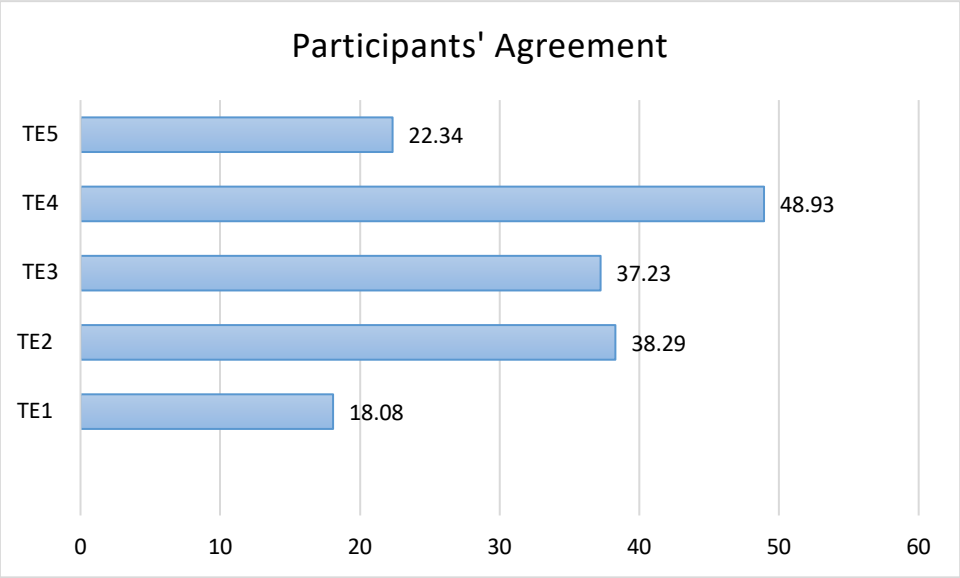

Figure 4.5: Respondents' Agreement with Training and Education

4.3.5.4 Resources and Infrastructure (RI)

This axis contains five paragraphs related to Resources and infrastructure. The following Table 4.10 shows these statements along with the statistical results for these paragraphs, followed by a detailed explanation of these results and indicators.

Table 4.10: Resources and Infrastructure

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD	Importance	Overall Response
RI4	3	8	36	43	4	3.39	0.83	68%	Neutral
RI1	2	23	28	38	3	3.18	0.92	64%	Neutral
RI2	3	14	47	26	4	3.15	0.84	63%	Neutral
RI3	4	12	53	22	3	3.09	0.81	62%	Neutral
RI5	4	21	43	24	2	2.99	0.86	60%	Neutral

RI1, RI2, RI3, RI4, RI5 refer to the items of Resources and Infrastructure, all details are in Appendix C.

Table 4.10 shows that item means in this axis ranged from 2.99 to 3.39. The item RI5 "The hospital collaborates with external consultants or other hospitals for LSS implementation" had the lowest mean (2.99, SD = 0.86), while RI4 "Data collection and reporting tools are available to monitor and measure process performance in real-time" had the highest (mean = 3.39, SD = 0.83).

All five items under this dimension received neutral responses, indicating a consistent pattern of uncertainty or ambiguity among participants regarding the hospital's capacity in terms of resources, tools, and infrastructure necessary for LSS

implementation. This uniform neutrality may suggest that staff either lack visibility into existing resources or that such resources are not sufficiently developed or communicated across the organization.

The absence of agreement or disagreement highlights a potential disconnect between strategic planning and operational awareness. It may also reflect that the hospital is at a preparatory or inactive stage in terms of allocating dedicated resources for LSS. These findings emphasize the importance of clearly establishing and communicating resource readiness to ensure organizational alignment and effective implementation of quality improvement initiatives. Figure 4.6 shows respondents' agreement with Resources and Infrastructure items.

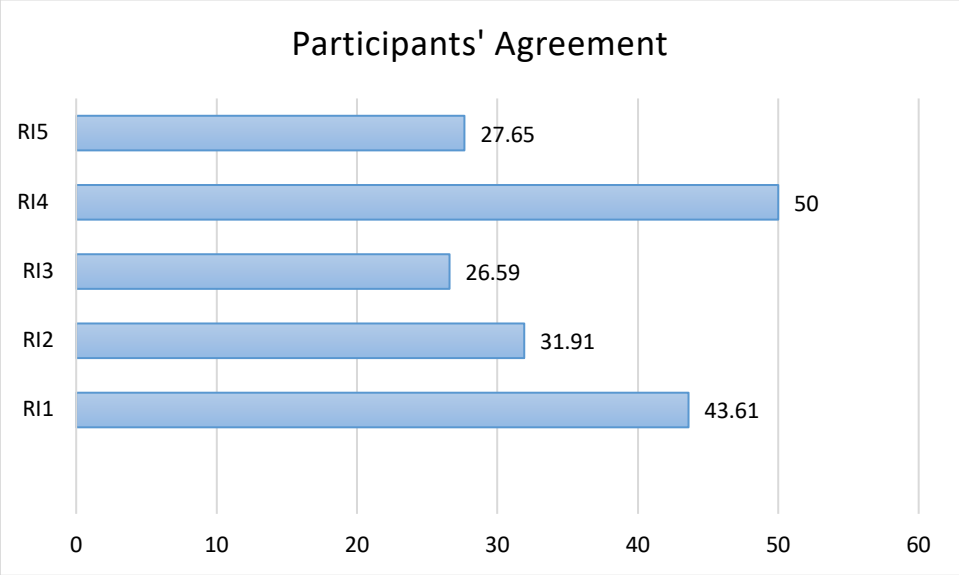

Figure 4.6: Respondents' Agreement with Resources and Infrastructure

4.3.5.5 Communication and Collaboration (CC)

Five items related to communication and collaboration are examined in this axis. Table 4.11 outlines these items along with their corresponding statistical results, accompanied by an in-depth interpretation of the findings and indicators.

Table 4.11: Communication and Collaboration

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD	Importance	Overall Response
CC1	1	6	28	52	7	3.62	0.76	72%	Agree
CC2	1	6	28	53	6	3.61	0.75	72%	Agree
CC4	1	6	33	49	5	3.54	0.74	71%	Agree

CC3	2	9	27	50	6	3.52	0.84	70%	Agree
CC5	14	17	33	28	2	2.86	1.07	57%	Neutral

CC1, CC2, CC3, CC4, CC5 refer to the items of Communication and Collaboration, all details are in Appendix C.

As shown in Table 4.11, the arithmetic means for the items in this axis varied between a low of 2.86 and a high of 3.62. The item CC5 "motivating factors such as promotions, monetary benefits, skill development, and decision-making involvement from top management" recorded the lowest mean of 2.86, with a standard deviation of 1.07. In contrast, the item CC1 "The hospital units collaborate respectfully and effectively to provide optimal patient care" achieved the highest mean of 3.62, with a standard deviation of 0.76.

Notably, only one item showed a significant number of neutral responses, distinguishing it from the others. All items had mean scores exceeding the hypothetical mean of 3, indicating that most participants agreed with the statements. The relatively low level of neutrality suggests a consensus among the study sample, highlighting communication and collaboration as crucial factors influencing the hospital's readiness and preparedness for adopting LSS methodology. Figure 4.7 expresses the respondents' agreement with this factor.

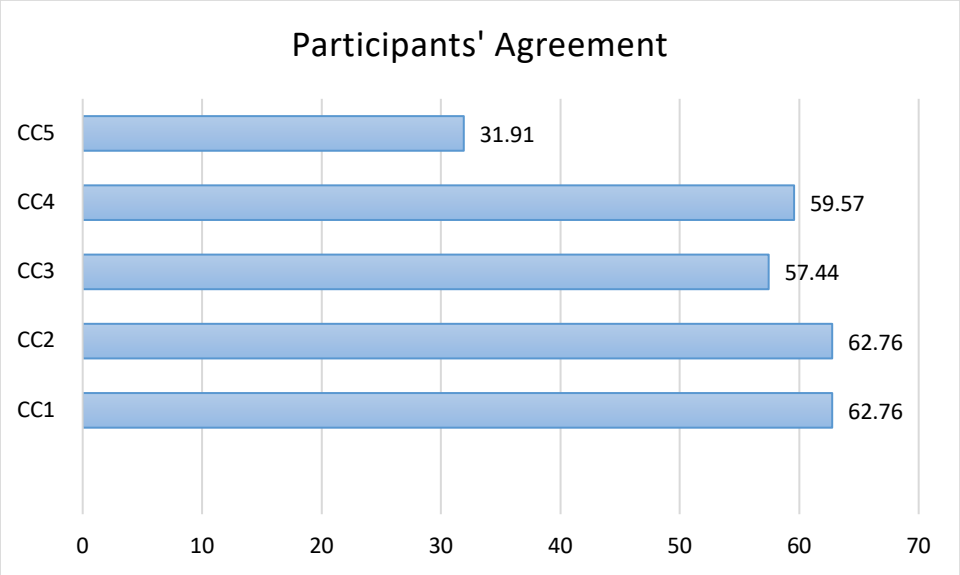

Figure 4.7: Respondents' Agreement with Communication and Collaboration

4.3.5.6 Current Process Evaluation (CP)

This section includes three paragraphs concerning the current process. The statistical results for these paragraphs are presented in Table 4.12. The findings are further examined and interpreted in the narrative that follows.

Table 4.12: Current Process Evaluation

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD	Importance	Overall Response
CP2	3	6	25	48	12	3.64	0.90	73%	Agree
CP3	3	9	36	44	2	3.35	0.81	67%	Neutral
CP1	10	24	34	22	4	2.86	1.07	57%	Neutral

CP1, CP2, CP3 refer to the items of Current Process Evaluation, all details are in Appendix C.

According to Table 4.12, the arithmetic means for the items in this dimension ranged from 2.86 to 3.64. The statement CP1 “Employees who contribute to the quality improvement process are rewarded by the hospital” received the lowest mean score (M = 2.86, SD = 1.07), while the statement CP2 “To ensure patient safety, the hospital focuses on reducing the incidence and impact of medical errors” achieved the highest mean (M = 3.64, SD = 0.90).

For the Current Process Evaluation dimension, two out of the three statements received neutral responses, while one item received an "Agree" response. This pattern indicates a moderate level of uncertainty among respondents regarding the hospital’s efforts to assess and analyze its existing processes in preparation for LSS implementation.

The neutrality in the majority of responses may suggest that ongoing evaluation practices are either not well communicated or not sufficiently structured to be clearly recognized by staff. However, the presence of one "Agree" response indicates that some positive perception exists, possibly reflecting isolated or department-specific efforts.

Overall, the findings point to a need for more visible, consistent, and organization-wide process evaluation efforts, which are essential for identifying areas for improvement and laying a strong foundation for successful LSS adoption. Respondents’ agreement with Current Process items are illustrated in figure 4.8.

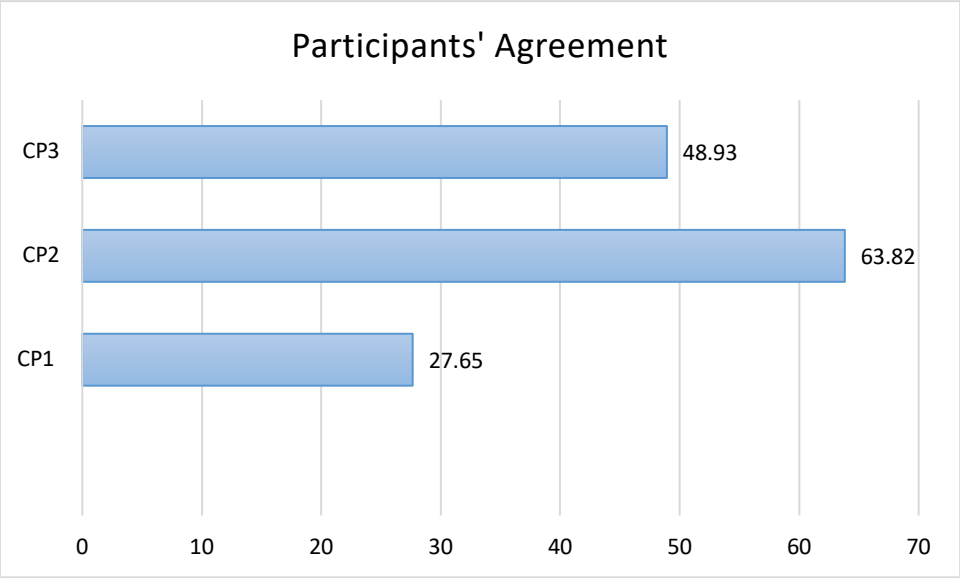

Figure 4.8: Respondents' Agreement with Current Process

4.3.6 Perceived Challenges and Enablers to LSS Implementation

Table 4.13 shows that the top three barriers to implementing LSS are, first, a lack of leadership support, which accounts for 16.3% of participants, followed by insufficient training at 13.6%, and budget constraints at 13.1%.

While 20.5% of participants believe that the most important enabler for LSS adoption in hospitals is leadership support, an equal percentage of 16.7% was for each of Committed employees, Good financial resources, and Sufficient training.

When asked about the difficulty of integrating LSS into daily operations, 42.6% of participants reported a neutral level of challenge, 25.5% indicated it is not very challenging, and only 9.6% found it very challenging. Overall, participants suggest that implementing and integrating LSS is not overly difficult.

As for resistance to LSS implementation, Table 4.13 reveals that the highest level of resistance comes from a lack of knowledge, with 33.3% of participants citing this as an issue. The second most common resistance factor is discrepancies between professional groups, mentioned by 24% of participants, while 20.8% identified the desire to maintain old ways of doing things as a significant barrier.

Table 4.13: Perceived Challenges and Enablers to LSS Implementation

Item	Sub item	Frequency	%
Primary Barriers	Lack of leadership support	36	16.3
	Insufficient training	30	13.6
	Budget constraints	29	13.1
	Insufficient time for projects	25	11.3
	Insufficient training	25	11.3
	Resistance to change	25	11.3
	Lack of good flow of information	22	10.0
	Lack of good flow of information	8	3.6
	Budget constraints	8	3.6
	Insufficient time for projects	5	2.3
	I don't know	4	1.8
	Resistance to change	3	1.4
LSS Integration Challenge	Very Challenging	9	9.6
	Somewhat Challenging	19	20.2
	Neutral	40	42.6
	Not Very Challenging	24	25.5
	Not Challenging at all	2	2.1
Enablers for LSS	Leadership support	54	20.5
	Committed employees	44	16.7
	Good financial resources	44	16.7
	Sufficient training	44	16.7
	Good flow of information	39	14.8
	Sufficient time for projects	35	13.3
	I don't know	2	0.8
	Other	1	0.4
Reasons for Resistance	Lack of knowledge	64	33.3
	Discrepancies between professional groups	46	24.0

	The will to maintain old ways to do things	40	20.8
	Tired of development projects	26	13.5
	Negative experiences from previous lean/six sigma initiatives	14	7.3
	Other	1	0.5
	I don't know	1	0.5

4.4 Partial Least Squares Structural Equation Modeling (PLS-SEM)

This chapter presents the findings of the PLS-SEM analysis used to assess the proposed research model. The results are organized into two major sections: the measurement model assessment and the structural model evaluation. The former evaluates the reliability and validity of the constructs, while the latter tests the research hypotheses and explores the mediation and moderation effects.

4.5 Structural Model and Interpretations

PLS-SEM is a widely used method for analyzing complex relationships between observed and latent variables. It is an extension of Structural Equation Modeling (SEM) that focuses on maximizing the explained variance of dependent constructs, making it particularly useful for predictive research. PLS-SEM is an alternative to traditional covariance-based SEM (CB-SEM) and is often employed when the goal is prediction rather than theory testing. Tools like SmartPLS 4 facilitate the application of PLS-SEM by allowing researchers to estimate models using both reflective and formative measurement models (Sarstedt et al., 2017).

PLS-SEM constructs a model that represents some observable or theoretical phenomenon, with variables assumed to be related by a system of equations. The model is typically visualized using arrows and symbols, where the relationships between variables (both statistical and potentially causal) are depicted. PLS-SEM is particularly capable at handling complex models with multiple dependent and independent variables, providing more flexibility in modeling relationships compared to traditional SEM methods. This method is especially valuable in cases where data does not meet the

assumptions required for CB-SEM, such as normality or large sample sizes. The estimation of these models is performed using statistical algorithms based on matrix algebra and generalized linear models (Ringle et al., 2015).

PLS-SEM offers several advantages over traditional SEM methods. It allows for testing of multiple theories simultaneously, evaluating the direct and indirect effects between variables, and accommodating measurement errors. Furthermore, it is effective for exploring new theoretical frameworks and developing models where the relationship between variables is not yet fully established (Sarstedt et al., 2017).

This section focuses on three key tests, essential for the current study: the direct effect test, and the test for the effect of the mediating and moderating factors. These tests are fundamental in determining whether the study's objectives and hypotheses are supported or rejected.

4.5.1 Assessing the Coefficient of Determination (R^2)

The coefficient of determination, commonly referred to as R-squared (R^2), is a statistical metric that indicates the proportion of variance in the dependent variable that can be explained by the independent variables in a regression model. In essence, R^2 measures the strength and explanatory power of the model, providing insight into how well the predictors account for the observed outcomes (Hair et al., 2017, p 34).

As presented in Table 4.14, the R^2 value in this study demonstrates strong predictive ability with a value of 0.888, meaning that approximately **88.8%** of the variance in the dependent variable, Readiness Level for LSS, is explained by the independent variables included in the model. This reflects a strong explanatory power and model strength in predicting organizational readiness for LSS implementation.

Table 4.14: Coefficient of Determination (R^2)

Independent variable	R Square	Adjusted R Square
Readiness LSS	0.888	0.876

4.5.2 Path Coefficients and Hypothesis Testing

Bootstrapping is a non-parametric resampling procedure applied in PLS-SEM to assess the significance and stability of path coefficients, outer weights, and other model

estimates. It is especially beneficial when the data distribution is non-normal, or the sample size is relatively small (Hair et al., 2022). This method provides estimates for standard errors, t-values, p-values, and confidence intervals by repeatedly resampling the dataset with replacement.

In this study, bootstrapping was conducted using SmartPLS 4 with 5,000 subsamples.

The results include both direct path relationships and measurement model indicators (especially for formative constructs), evaluated based on their statistical significance.

In this study, the bootstrapping analysis was applied to assess hypotheses 1 through 6, specifically to analyze the relationships between Awareness of LSS Impact, Management Commitment and Leadership, Organizational Culture, Training and Education, Resources and Infrastructure, Communication and Collaboration, Current Processes, and Readiness Level for LSS.

The Table 4.15 reports the standardized path coefficients**,** t-values**,** p-values, and 95% confidence intervals (CI) bias corrected generated through bootstrapping in SmartPLS4, which are used to test the study hypotheses**.** A path is considered statistically significant if the p-value is below 0.05**.**

Table 4.15: Bootstrapping Results for Direct Paths

Relationship (Path)	Original Sample (β)	Sample Mean	STDEV	t-value	p-value	95% CI	Decision
ML → RL	0.213	0.214	0.085	2.524	0.012	(0.047-0.379)	Significant
OC →RL	0.301	0.327	0.149	2.016	0.044	(-0.026-0.579)	Significant
TE →RL	0.094	0.088	0.062	1.514	0.130	(-0.026-0.219)	Not significant
RI →RL	0.291	0.290	0.095	3.071	0.002	(0.114-0.486)	Significant
CC →RL	0.176	0.155	0.092	1.923	0.055	(0.012-0.369)	Marginally non-significant
CP →RL	0.028	0.046	0.083	0.332	0.740	(-0.138-0.184)	Not significant

RL: readiness level, ML: management commitment and leadership support, OC: organizational culture, TE: training and education, CC: communication and collaboration, RI: resources and infrastructure, CP: evaluation of current processes.

4.5.3 Relationship Between Hospital Readiness for LSS and Study Variables

As shown in Table 4.15, several significant relationships were identified between the study variables and Readiness Level for LSS. Management Commitment and Leadership (ML) with a P- value of 0.012 has a significant positive effect on Readiness Level ($\beta = 0.213$, $t = 2.524$), supporting the hypothesis that leadership involvement contributes to organizational readiness.

Similarly, Organizational Culture (OC) demonstrated a significant positive influence, reflected by a coefficient of 0.301, $t = 2.019$, and p-value of 0.044, suggesting that a supportive culture facilitates LSS readiness.

Resources and Infrastructure (RI) emerge with strongest effect and clean pathways to RL, with a significant coefficient of 0.291 (p-value < 0.002), reflecting their theoretical and practical significance in shaping readiness.

In contrast, Training and Education (TE) didn't show significant influence on RL with a p-value= 0.130. Similarly, Communication and Collaboration (CC), which was marginally non- significant in this model, with a coefficient of 1.923, though close to significance, it does not reach the 0.05 threshold (p-value < 0.055). Furthermore, Current Processes (CP) did not show a statistically significant relationship with Readiness Level for LSS, as its p-value exceeded the 0.05 threshold ($p = 0.740$)**,** indicating that evaluating current processes may not directly impact readiness

The structural inner model visualization (Figure 4.9) clearly illustrates the complexity and interconnectivity of the latent constructs influencing hospital readiness for LSS implementation. Central to the model is the Readiness Level (RL) construct, which is the dependent variable receiving direct paths from several organizational and contextual predictors.

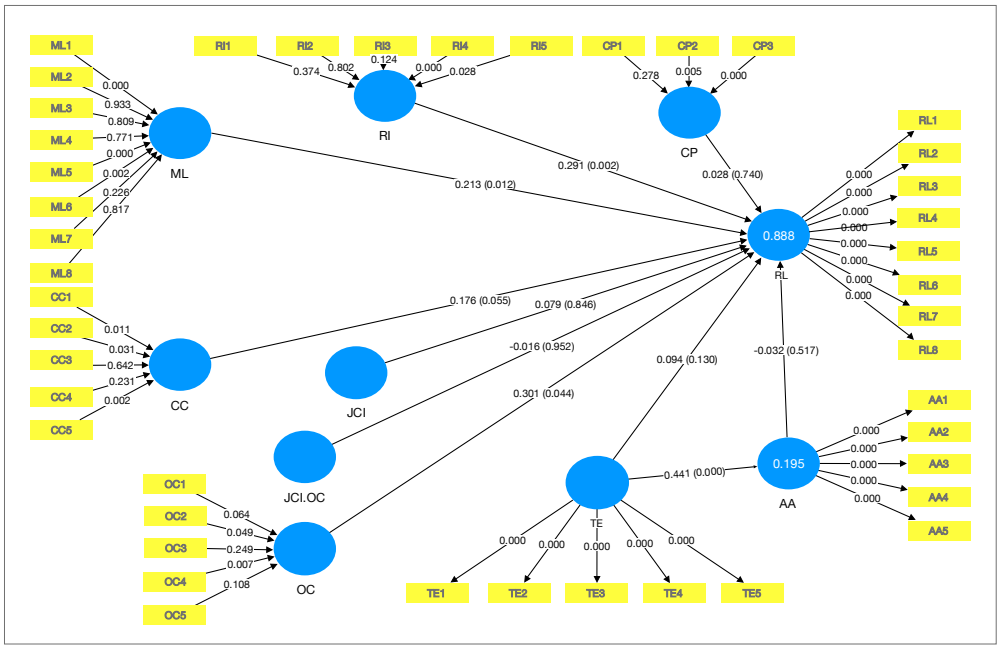

Figure 4.9: Structural Model with Path Coefficients and Significance Levels

4.5.4 Effect Size (f^2)

According to Cohen (1988), effect size is a quantitative measure of the strength of a phenomenon. He defines it to express the magnitude of the difference or relationship between groups or variables, providing a clearer understanding of the practical significance of statistical findings, beyond just the p-value. Cohen provided guidelines for interpreting the effect size (f^2): an f^2 value less than 0.02 indicates a small effect; a value between 0.02 and 0.15 represents a medium effect; and a value greater than 0.15 indicates a large effect. Cohen's f^2 is typically expressed in the form: $f^2 = (R^2_1 - R^2)$.

The effect size analysis (f^2) presented in Table 4.16 shows that resources and infrastructure (RI) had the strongest contribution to explaining variance in readiness level (RL), with a large effect size of 0.201. In contrast, management and leadership ((ML → RL, f^2 = 0.108), organizational culture (OC → RL, f^2 = 0.066), communication and collaboration (CC → RL, f^2 = 0.070) and training and education (TE → RL, f^2 = 0.028) exhibited small-to-medium effects. By comparison, awareness (AA → RL, f^2 = 0.005) and current processes (CP → RL, f^2 = 0.002) showed negligible contribution to RL.

Additionally, the relationship between training and education and awareness (TE → AA) demonstrated a large effect size (f^2 = 0.242), reinforcing the critical role of training in raising organizational awareness.

Although several predictors exhibited practical relevance in terms of effect size, the bootstrapping results revealed that none of these paths reached statistical significance at the 0.05 level. The strongest observed effect (RI → RL, $f^2 = 0.201$) was not statistically significant ($t = 1.212$, $p = 0.226$), while the TE → AA path ($f^2 = 0.242$) approached significance ($t = 1.720$, $p = 0.086$) but did not cross the threshold. These findings suggest that while some constructs show meaningful contributions to variance in readiness, their influence should be interpreted cautiously due to the absence of statistical confirmation.

Table 4.16: Effect Size (f^2)

Path	f^2	t- value	p- value	Interpretation
ML → RL	0.108	1.033	0.302	Small-to-medium effect
OC → RL	0.066	0.636	0.525	Small-to-medium effect
TE → RL	0.028	0.624	0.533	Small-to-medium effect
RI → RL	0.201	1.212	0.226	Large effect
CC → RL	0.070	0.845	0.398	Small-to-medium effect
CP → RL	0.002	0.052	0.958	Negligible effect
TE → AA	0.242	1.720	0.086	Large effect
AA → RL	0.005	0.198	0.843	Negligible effect

RL: readiness level, ML: management commitment and leadership support, OC: organizational culture, TE: training and education, CC: communication and collaboration, RI: resources and infrastructure, CP: evaluation of current processes, AA: awareness of LSS impact.

4.5.5 Mediation Analysis

H7: Staff awareness of the impact of LSS mediates the relationship between training and education and hospital readiness for LSS implementation.

The mediation analysis examined whether awareness (AA) mediates the relationship between training and education (TE) and readiness level (RL). The results revealed that the specific indirect effect (TE → AA → RL) was not statistically significant ($\beta = –0.014$, $t = 0.603$, $p = 0.547$), with the 95% bias-corrected confidence interval [–0.070, 0.025] including zero (see Table 4.17). These findings indicate that awareness does not mediate the relationship between training and education and organizational readiness. While TE positively influences awareness directly (p- value =0.000), confirming that

employee training boosts awareness of LSS impacts but this effect does not translate into a significant change in readiness through AA.

Table 4.17: Specific Indirect Effect (Mediation)

Relationship	Original sample	Sample mean	STDV	t-value	p-Value	95% CI
TE →AA →RL	-0.014	-0.013	0.024	0.603	0.547	(–0.070, 0.025)

TE: training and education, AA: awareness of LSS impact, RL: readiness level.

4.5.6 Moderation Analysis

H8: JCI Accreditation strengthens the relationship between organizational culture and hospital readiness for LSS implementation.

The study model incorporates a moderation effect through the interaction term JCI*OC, which evaluates whether JCI accreditation status strengthens the impact of organizational culture on readiness. Although this interaction is conceptually sound, its contribution appears minimal in the visual model.

As shown in Table 4.18, the analysis revealed that the interaction effect between JCI and OC on RL was not statistically significant, as the p-value exceeded the 0.05 threshold (p= 0.844). This result indicates that JCI Accreditation does not moderate the relationship between organizational culture and hospital readiness for LSS implementation.

Table 4.18: Moderation Results

Relationship	Original sample	Sample mean	STDV	t-value	p-Value	95% CI
JCI → RL	0.079	0.136	0.410	0.194	0.846	(-0.820, 0813)
JCI*OC →RL	-0.016	-0.058	0.257	0.061	0.952	(-0.466, 0.581)
OC → RL	0.301	0.327	0.149	2.016	0.044	(-0.026, 0.579)

RL: readiness level, OC: organizational culture, JCI: the joint Commission Accreditation

4.6 Model Fit (SRMR)

The standardized root mean square residual (SRMR) was used to assess model fit. The SRMR for the saturated model was 0.103 and for the estimated model was 0.114.

Both values exceed the commonly accepted threshold of 0.08, indicating that the overall model fit is suboptimal. These results suggest that while the structural model explains a high degree of variance (e.g., R^2 for RL = 0.888), there may be room for improvement in how well the model reproduces the observed correlations among constructs.

4.7 Awareness of LSS Impact and Demographic Variables

H9: There are significant differences in the mean perceptions and awareness of LSS among participants based on their demographic characteristics (i.e., age, gender, educational level, work experience, and job title).

As presented in Table 4.19, the analysis revealed that there were no statistically significant differences in the mean awareness of LSS across the demographic variables of gender, age, educational level, and years of experience, as the p-values for all these variables were greater than 0.05. This suggests that participants' awareness and perceptions of LSS were relatively consistent regardless of their demographic backgrounds.

Table 4.19: Awareness about LSS Impact with Demographic Variables

Item	Category	Mean	p-value
Gender	Female	1.375	0.982
	Male	1.370	
Age	20-24 Years	3.725	0.975
	25-29 Years	3.667	
	30-34 Years	3.715	
	≥ 35 Years	3.752	
Education level	Diploma	3.550	0.559
	Bachelor's	3.641	
	Master's	3.844	
	PhD/Specialist	3.850	
Experience Years	5 years or less	3.679	0.882
	6-10 years	3.842	
	11-15 years	3.632	
	≥ 16 years	3.765	

4.8 Familiarity with LSS and Demographic Variables

H10: There are significant differences in participants' familiarity with LSS based on their demographic characteristics.

As shown in Table 4.20, the analysis indicated that there were no statistically significant differences in participants' familiarity with LSS across the demographic variables of gender, age, educational level, and years of experience, as the p-values for all comparisons were greater than 0.05. This suggests that familiarity with LSS is relatively uniform among participants, regardless of their demographic backgrounds.

Table 4.20: Familiarity LSS with Demographic Variables

Item	Category	No	Yes, Lean thinking	Yes, LSS	Yes, Six Sigma	p-value
Gender	Female	30		12	2	0.264
	Male	34	3	9	4	
Age	20-24 Years	8				0.117
	25-29 Years	21		6		
	30-34 Years	17	1	4	4	
	≥ 35 Years	18	2	11	2	
Education level	Diploma	3		1		0.119
	Bachelor's	45	1	6	2	
	Master's	14	1	13	4	
	PhD/Specialist	2	1	1		
Experience Years	5 years or less	26	1	6		0.126
	6-10 years	15		2	2	
	11-15 years	15		8	2	
	≥ 16 years	8	2	5	2	

4.9 Independent Samples t-Test for JCI Accreditation and Readiness (H11)

Before conducting the independent-samples t-test, its key assumptions were assessed. First, independence of observations was ensured by having two distinct groups of hospitals (JCI-accredited vs. non-accredited). Second, the dependent variable (readiness level) was continuous and measured on an interval scale. Third, given the sample sizes (n = 32 and 62), the assumption of normality was considered satisfied based on the Central Limit Theorem. Finally, Levene's Test for Equality of Variances indicated that the assumption of equal variances was met, $F(1, 92) = 1.614$, $p = .207$. Therefore,

the conditions required to perform the independent-samples t-test were met. These criteria; variable scale, independence, approximate normality, sufficient sample size, and variance homogeneity; are consistent with the conditions outlined for the independent t-test (Kim & Park, 2019).

An independent-samples t-test was performed to compare hospital readiness for LSS implementation between JCI-accredited and non-accredited hospitals. Results in Table 4.21 indicated a statistically significant difference in readiness levels: JCI-accredited hospitals (M = 3.55, SD = 0.46) reported significantly higher readiness scores than non-accredited hospitals (M = 3.03, SD = 0.65), t(92) = -4.47, p < .001, 95% CI [-0.75, -0.29]. This finding supports the hypothesis that accreditation is associated with greater hospital preparedness for LSS adoption.

Table 4.21: Independent-Samples t-test Results

Group	N	Mean	SD	t	df	p-value	95% CI of Difference
JCI-accredited	62	3.55	0.46	-4.47	92	< 0.001	[-0.75, -0.29]
Non-accredited	32	3.03	0.65				

JCI: the Joint Commission Accreditation.

4.10 Chapter Summary

This chapter presented the results of the PLS-SEM analysis conducted using SmartPLS4 to investigate the factors influencing hospital readiness for LSS implementation. The model demonstrated high explanatory power, with an R^2 value of 0.888 for the Readiness Level construct, indicating that the independent variables collectively account for a substantial proportion of the variance.

In response to the research question examining the relationship between key organizational factors and hospital readiness for LSS, the results show that three of the six proposed factors; management commitment and leadership, organizational culture, and resources/infrastructure; had a statistically significant positive effect. In contrast, training and education, communication and collaboration, and current process evaluation did not show a significant direct relationship with readiness.

Additionally, Training and Education had a positive impact on participants' awareness of LSS. However, this increased awareness did not translate into higher readiness levels. As a result, the mediation hypothesis (H7) was not supported. Although staff became more aware through training, that awareness alone wasn't enough to influence the organization's overall readiness for LSS implementation.

The moderation effect of JCI Accreditation was also not supported by the data, although the JCI- accredited hospitals exhibited more readiness level to implement LSS with a p value < 0.001.

While some predictors (e.g., RI and TE → AA) demonstrated medium effect sizes**,** none of the f^2 values reached statistical significance, suggesting limited unique contributions when accounting for other model variables. Furthermore, the model fit**,** as indicated by SRMR values (> 0.08), was slightly below ideal thresholds, implying room for future refinement.

Overall, the results highlight the multidimensional nature of organizational readiness for LSS and emphasize the central roles of leadership commitment, cultural alignment, and infrastructural preparedness. These findings suggest that while awareness and accreditation may play indirect or contextual roles, tangible resource allocation and leadership involvement remain the most decisive factors for successful LSS implementation in healthcare settings.

Chapter Five: Discussion

5.1 Introduction

This chapter discusses the key findings of the study based on the data analysis presented in Chapter 4. It aims to interpret the results in the context of the research objectives and hypotheses, compare them with previous literature, and highlight practical implications. The chapter also addresses the limitations of the study and proposes directions for future research.

5.2 Discussion of Key Findings

5.2.1 Hospital Readiness for LSS Implementation: A Multifactor Construct

The results of this study indicate that overall hospital readiness for LSS implementation in the West Bank is moderate. While there is a general awareness of LSS impact among respondents of the potential benefits of LSS; such as enhancing service quality, reducing medical errors, and streamlining processes; significant structural and organizational limitations persist. These limitations, particularly in infrastructure, staff training, and sustained leadership engagement, present key barriers to effective LSS adoption.

Moderate readiness suggests that while some foundational elements for quality improvement exist, the healthcare system lacks the comprehensive support systems required to operationalize LSS principles. This includes insufficient data infrastructure, limited access to continuous training programs, and the absence of formalized quality management departments in some hospitals.

The structural model revealed a high explanatory power, with an R^2 of 0.888 for the readiness level construct. This indicates that the independent variables; management commitment and leadership, organizational culture, training and education, communication and collaboration, resources and infrastructure, current processes evaluation, and awareness, collectively account for nearly 89% of the variance in readiness. This confirms the multidimensional nature of organizational readiness and supports prior research emphasizing the complexity of quality improvement adoption in healthcare systems (Weiner, 2009).

Furthermore, the current findings align with previous regional studies suggesting that LSS remains an underutilized strategy in many Middle Eastern healthcare systems due to similar structural and systemic challenges (Isa & Elaradi, 2024; Vaishnavi & Suresh, 2020a). For example, limited financial resources, insufficient training, and lack of leadership support often led to inconsistent quality improvement practices. Like this study results, Awang et al. (2022) found that around 10% of Malaysian hospitals in the public sector record good readiness level.

Although this study found that hospitals in the West Bank show only moderate readiness for implementing LSS, comparisons with other countries in the region highlight important differences. A recent study on Oman's healthcare sector, for example, revealed a relatively high level of preparedness for lean implementation. That was because leaders strongly support, clearly focus on value creation and patient needs, and they can adopt a thorough view of healthcare processes. Staff members are aware of implementation efforts, and they actively engage in relevant training programs. The findings suggest that Oman is well-positioned to achieve meaningful improvements and to scale lean practices if implementation is managed effectively as well as could (Sohal et al., 2021).

West Bank hospitals meet more obstacles at the foundational level in comparison. This is characterized by limited leadership engagement in quality initiatives, and LSS practices do not fully align with broader planned goals in addition to inconsistent training opportunities. Lessons from Oman's example should be learned for the West Bank to advance LSS readiness; organizations must commit more strongly to developing leaders, building capacity, and integrating LSS principles into systems that measure and manage performance.

Of particular concern is the discrepancy between theoretical knowledge and practical readiness. So, the full benefits of LSS cannot be achieved without leadership development, technical capacity building, and strategic planning. Policymakers and hospital administrators should think about implementing LSS in stages, starting with initial investments in data infrastructure, leadership alignment, and training.

Finally, these contextual challenges unique to the West Bank, including political uncertainty, resource constraints, and decentralized healthcare governance, must be considered when interpreting readiness levels. These external pressures may further complicate the deployment of systematic quality initiatives like LSS, underscoring the need for tailored, context-sensitive implementation strategies.

5.2.2 Staff's Perceptions of LSS

This study found that most respondents lacked exposure to LSS, and the majority didn't have formal training in its tools. Due to the fact that people lack that foundational knowledge, implementation struggles, leading to misunderstanding what LSS goals are, resist any change, and poorly engaging those quality initiatives. In similar context, Fathi et al. (2022) studied a hospital nursing staff in Cairo and found that over half of them knew little of Six Sigma and thought the organization was not ready to adopt its practices. Their study did additionally confirm the positive correlation between Six Sigma knowledge and perceived readiness, and that suggests staff who are more informed will be more likely to support and to ease change.

Isa and Elaradi (2024) found that most of their study sample (88%) were unfamiliar with LSS methodology, this was likely because that leadership-level training on continuous improvement approaches was absent, affecting overall staff awareness across the healthcare sector.

The shortage of LSS awareness among healthcare workers may arise from insufficient exposure during academic preparation, as well as the lack of continual professional development programs focusing on quality improvement methods. Sreedharan and Raju (2016) stated the necessity of creating awareness among employees and management about the relevance and benefits of LSS. They argued that improving staff understanding is a key factor in ensuring the successful implementation of LSS within organizations. From a change management perspective, this reinforces the need to integrate education and awareness-building into the early stages of any improvement initiative.

As supported by theories of innovation diffusion and quality culture development, awareness is the first step toward engagement and ownership. Hospitals aiming to improve readiness for LSS adoption should therefore invest in structured training programs, provide contextual examples from clinical practice, and involve staff in quality discussions early on to enhance both understanding and commitment (Albliwi et al., 2014).

5.2.3 Impact of Independent Variables on Readiness (H1-H6)

Management Commitment and Leadership (H1)

Management commitment and leadership showed a statistically significant and positive relationship ($\beta = 0.213$, $p = 0.012$) with hospital readiness level (RL), reaffirming its critical role in driving LSS implementation success. This finding aligns with existing literature emphasizing that active leadership involvement is not only a key driver but often the starting point for initiating and sustaining quality improvement initiatives (Laureani & Antony, 2012; Sohal et al., 2022; Shreeranga et al., 2019).

Leaders who demonstrate visible commitment to LSS through resource allocation, regular communication, and engagement with frontline staff can significantly influence organizational culture and staff attitudes towards change. Transformational leadership styles have been associated with higher readiness levels, as they inspire and motivate employees to embrace continuous improvement goals. According to Laureani and Antony (2017), effective leadership shapes strategic vision and encourages teams to apply data-driven decision-making, which is foundational in LSS methodologies.

Leadership is of critical importance in complex and resource-constrained healthcare systems such as are those in Palestine. It helps in overcoming resistance to change by the clarification of LSS benefits, dealing with staff doubts or concerns, and fostering a culture valuing efficiency and patient-centered care. As Sohal et al. (2022) highlight, managerial engagement and leaders' support along with promotion of process improvements often directly influences healthcare institutions' readiness. Bhat et al. (2022) suggest a multi-level model matching this result, emphasizing that leadership dedication among top managers is needed for LSS's successful use and upkeep in healthcare locations.

These findings highlight the true need for healthcare leaders to take on a practical role more than give symbolic support. LSS principles could be taught to leaders so they can build channels for clear communication and quality improvement could integrate into strategic planning. This study shows that when leaders act in a proactive way and clearly engage with LSS values, hospitals become more ready for implementation of LSS in a large manner.

Organizational Culture (H2)

The results showed that organizational culture strongly impacted hospital readiness to implement LSS ($\beta = 0.301$, $p = 0.044$). This finding supports the hypothesis that when

a culture is open, oriented to change, and considers safety, it offers a rich environment for continuous improvement efforts to be developed. Staff are more likely to engage in and sustain LSS practices when the prevailing culture inside a hospital encourages innovation, accountability, and shared values around patient safety and quality; in which consistent with Kotter's eight steps change model (Kotter, 2012) and LSS case studies in healthcare.

A supportive organizational culture, according to Poksinska (2010) and McDermott et al. (2022), is a critical enabler for successful LSS adoption in healthcare. A culture embracing continuous learning along with valuing feedback tends to empower employees at all levels for active contributions in improvement initiatives.

Additionally, Vaishnavi and Suresh (2020b) highlighted that it is important to embed LSS within the existing work framework of healthcare institutions. They noted aligning improvement efforts with an organization’s mission and policies and available resources improves clarity and commitment among staff. When LSS goals are clearly communicated, the hospital is better positioned for fostering engagement and accountability.

In the context of Palestinian hospitals, where systemic constraints and resource limitations already pose significant challenges, having a strong organizational culture may be even more crucial. When staff feel that improvement efforts are aligned with their values and that leadership supports and models quality-focused behavior, they are more likely to adopt LSS methods even in the absence of abundant resources. Therefore, investing in cultural transformation should be a foundational step in any LSS implementation strategy.

Furthermore, in the instance positive organizational culture, it is able to increase the effectiveness in training, communication, and leadership, reinforcing a cycle to enhance hospital readiness. This result highlights why LSS technical tools are worth introducing and provide evidence on the importance of fostering the human capital, behavioral aspects that finally shape lasting achievement.

Training and Education (H3)

Surprisingly, readiness was not affected greatly by TE or directly ($\beta = 0.094$, $p = 0.130$). However, it did show an important effect on Awareness (AA) with a $p < 0.001$ highlighting the indirect role in the shaping of perceptions. In this study, training was not significantly linked to readiness likely because most participants had limited or

introductory exposure to LSS concepts. The training they received may not have been deep or applied enough to affect generalized hospital preparedness. Moreover, without leadership follow-up or process integration, such training may raise awareness but remain disconnected from real operational change.

The literature is in agreement with this kind of interpretation. It posits training a basic necessity for LSS success in healthcare. Awang et al. (2022) state that effective training sets up the basis for expertise in LSS tools and techniques. Likewise, Vaishnavi and Suresh (2020b) stress that healthcare staff should have proper knowledge which is important to the practical execution of LSS projects so they can actively engage in both identifying inefficiencies and driving improvements.

However, the challenge lies not only in training but also in its quality, relevance, and contextualization. Poksinska (2010) explores that many healthcare institutions do not have internal expertise relying often on external trainers with manufacturing backgrounds. These trainers can battle in order to communicate concepts effectively within the healthcare context and use examples and language foreign to clinical staff. Healthcare professionals may thus struggle to relate to the content, which can obstruct engagement with and delay internalizing LSS principles.

This disconnect underlines the need for tailored educational approaches that translate LSS tools into healthcare-relevant scenarios and incorporate real-world examples from clinical environments. Hands-on experience along with continuous learning opportunities have to be embedded into their daily routines instead of more isolated training events. When leaders offer support for training as a part of a plan of long-term professional development that is aligned with goals of the organization, it likely readies employees and it changes them sustainably.

In the Palestinian context, formal LSS education still emerges as constrained, so it is important for hospital top management to invest in targeted, accessible, as well as context-specific training programs. Without leadership support or cultural alignment, adoption efforts may stall. Therefore, they should prioritize strengthening of training frameworks as well as building of internal capacity. Any roadmap toward LSS implementation should include those priorities.

Communication and Collaboration (H4)

Although CC approached significance ($\beta = 0.176$, $p = 0.055$), it fell just above the 0.05 threshold. This may indicate that while communication is valued, its effect is indirect

or mediated by other constructs like leadership or culture. Future research may examine its role as a moderator or explore differences across departments or hierarchical levels. Although communication is valued in theory, the current study findings suggest that hospitals in the West Bank may still operate in silos, with limited structured collaboration. This may explain why communication did not significantly predict readiness, it may be present, but not yet formalized or linked to LSS goals in practice.

This underscores the importance of transparent communication channels and interdepartmental cooperation when initiating quality improvement efforts. Clear and consistent communication helps reduce misunderstandings, align expectations, and minimize resistance to change which is a finding echoed in Ajmera & Jain (2019) research, which highlighted that effective communication of goals and outcomes is critical to overcoming staff hesitancy during LSS implementation.

Al-Balushi et al. (2014) emphasized that for LSS to be successful in healthcare settings, it must be communicated not as a temporary initiative, but as part of a long-term strategy embedded within the organization's vision and policies. When staff understand that LSS is integral to the institution's strategic goals, they are more likely to engage with it seriously and sustainably.

Furthermore, healthcare systems are complex and multidimensional. Poksinska (2010) noted that improvement often needs units to coordinate efforts across units, which is hard if departments are in silos or do not know how changes affect each other. For there to be an improvement in one area, it needs proper communication for effectiveness. Without this, another department may experience unintended inefficiencies. Therefore, the entire system should be assessed, and that viewing of departments' collaboration will ensure improvements integration instead of isolating.

In the context of Palestinian hospitals, where operational and structural challenges are common, fostering an environment of open communication and cross-functional teamwork becomes even more crucial. Encouraging dialogue among departments, ensuring clarity around LSS goals, and sharing successes and challenges openly can contribute significantly to building readiness and achieving sustainable improvements.

Resources and Infrastructure (H5)

Resources and infrastructures had one of the strongest effects on the successful implementation of LSS ($\beta = 0.291$, $p = 0.002$), reinforcing the conclusions of McDermott et al. (2022), who argued that successful LSS implementation requires robust

infrastructure and appropriate tools. This strong relationship highlights the critical role of having the necessary systems, technologies, and physical resources in place to support quality improvement initiatives, particularly in complex healthcare settings.

Moreover, Vaishnavi et al. (2019) stressed that top management should ensure the availability of key resources, including human capital, financial support, adequate space, and materials, required for implementing change effectively. Without these inputs, even well-designed LSS programs may fall short of their objectives.

Taken together, these studies and the current findings underscore that a strong foundation of resources and infrastructure is not just supportive, but essential for the successful adoption and long-term sustainability of LSS. Healthcare organizations aiming to implement LSS must therefore prioritize investments in infrastructure and ensure consistent resource availability to facilitate process improvement and achieve desired outcomes.

Current Process Evaluation (H6)

The results revealed that Current Process Evaluation (CP) did not have a statistically significant impact on LSS readiness, which contrasts with previous findings that emphasize the value of achieving quality outcomes within continuous assessment (Al-Balushi et al., 2014). Even though process evaluation is viewed often by people as a foundation for continuous improvement, current findings suggest that, inside the context of the West Bank healthcare sector, evaluating existing processes alone is not enough for change meaningfully, especially when strong leadership does not commit itself and resources are not sufficient. This result may reflect a disconnect among existing quality initiatives along with the broader LSS framework. Hospitals may still be in early stages of evaluating or aligning their processes to LSS principles, as indicated by that disconnect.

From what can be observed in this study, it seems that process evaluation in many hospitals may be conducted as a routine task, often disconnected from meaningful action or change. Participants may report evaluating processes, but without structured systems to link that evaluation to leadership decisions, improvement efforts, or incentives, it does not translate into greater readiness for LSS.

This outcome highlights the importance of a more holistic readiness for LSS, where evaluation efforts are supported by an enabling environment. As noted by Al-Balushi et al. (2014), a key factor in successful implementation is the presence of measurement and

reward systems that are clearly aligned with LSS objectives. Without such alignment, process evaluation may lose its strategic relevance and fail to motivate staff or drive meaningful improvements.

Additionally, Al-Balushi et al. (2014) have argued that performance indicators play a critical role in motivating continuous improvement efforts. When staff can see tangible connections between their efforts, performance metrics, and organizational goals, they are more likely to engage actively in improvement initiatives. The absence of such motivational structures could explain the limited impact of process evaluation found in this study.

Overall, these findings point to the need for integrated systems where process evaluation is not an isolated activity, but part of a broader framework that includes leadership support, resource availability, and performance-based incentives. This integrated approach appears to be more effective in creating the conditions necessary for LSS success, particularly in resource-constrained or transitional healthcare systems like those in the West Bank.

These results partially support the hypothesized framework, indicating that not all theoretically expected factors significantly influence readiness. While leadership and infrastructure remain strong predictors, the insignificant effect from training, communication, and process evaluation suggests possible contextual or implementation gaps that need further exploration.

Sreedharan et al. (2018) conducted a comprehensive content analysis of 41 scholarly articles to identify the most influential Critical Success Factors (CSFs) in continuous improvement approaches such as TQM, Lean, Six Sigma, and LSS. Their findings emphasize that top management commitment is the most crucial driver of success, closely followed by factors such as training, effective communication, customer orientation, organizational culture, employee involvement, teamwork, supplier collaboration, and infrastructure readiness. These insights align with the present study's findings, reinforcing that successful LSS adoption in healthcare settings is not solely dependent on technical tools but also on a holistic set of organizational enablers, especially leadership support and cultural readiness.

5.2.4 Mediation by Awareness (H7)

The mediation hypothesis (H7) suggested that Awareness of LSS Impact might explain how Training and Education lead to Hospital Readiness. However, the results didn't support this argument. Although training did significantly increase awareness, that awareness didn't have a meaningful impact on readiness. This might be because gaining knowledge alone isn't enough; without the managerial support needed to work on that knowledge, awareness doesn't turn into action.

Simply put, training helps staff understand LSS principles and tools, but understanding alone won't prepare an organization for generalized adoption unless it's backed by strong leadership, a supportive culture, and the required infrastructures. These findings show that building readiness for LSS is not just about learning employees, it's about creating an environment where that awareness can lead to real change.

This is consistent with Alenzi's (2023) work, which highlighted how knowledge management helps translate human resource (HR) efforts into real improvements in employee performance. His study, conducted in Qatari hospitals, found that even strong HR practices need to be supported by effective systems for sharing and applying knowledge. Without this, training risks becoming a one-time event rather than a lasting influence. In the case of LSS, this means that hospitals must not only train staff but also provide an environment where learning is reinforced, knowledge is shared, and staff are encouraged to engage with the principles behind the tools.

This aligns with the concern revealed in this study that many staff members had no previous exposure to LSS and lacked formal training. Such lack of foundational knowledge creates a serious barrier to effective implementation. If awareness is missing, readiness cannot be achieved, regardless of the number of training sessions delivered.

Supporting this, Gowen et al. (2009) stressed organizational educational settings as important in initiatives for improving quality successfully. According to their study, better outcomes result from transformational leadership paired with strong knowledge-sharing systems. Organizational knowledge management matters more than isolated leadership or training efforts they argued. In healthcare settings, where processes prove complex and change is slow, this type of environment represents necessity toward improvement efforts like LSS to take root.

With these findings being considered, it then becomes clear that building awareness is all about how to change staff thinking. Staff engagement with quality improvement

initiatives matters alongside information delivery too. For hospitals that seek to adopt LSS, they must go beyond just technical training and focus on the creation of a culture that truly values learning. Staff must be equipped to confidently use LSS tools daily while also encouraging continuing discussions regarding better quality.

Findings of this study highlight the significance of awareness as a link between knowledge and action. When staff understand and believe in the purpose and value of LSS, they are far more likely to support and participate in its implementation; making awareness not just a mediator, but a key driver of readiness.

5.2.5 Moderation by JCI Accreditation (H8)

The hypothesized moderation effect of JCI accreditation on the OC → RL relationship was not supported in this study, as indicated by a very high p-value ($p = 0.952$). This unexpected result suggests that accreditation status does not enhance the influence of organizational culture on readiness for LSS implementation in the sampled hospitals. Although accreditation is widely viewed as a mechanism to drive quality improvement and cultural transformation, in this study, it appears that formal accreditation may not translate into the internal cultural readiness required for LSS. This disconnect may reflect the difference between structural compliance with accreditation standards and the deeper, informal cultural factors that enable successful continuous improvement initiatives.

This finding contrasts with much of the existing literature, which often positions accreditation as an important driver that improves quality along with transforming organizations. For instance, Al-Araidah et al. (2010) argue that accreditation frameworks like JCI provide healthcare organizations with a structured roadmap because they improve service delivery, improve patient safety, and align with international best practices.

However, present outcomes imply accreditation could strengthen structural or procedural adherence, accreditation does not intrinsically cultivate the open, learning-oriented, and change-embracing culture that supports true readiness for LSS. Critically, this distinguishes formal certification from what transforms culture actually. In other words, accreditation might ensure policies are present, but frontline staff and managers do not necessarily represent the values, attitudes, and collaboratively behave so LSS successfully adopts.

This gap might be particularly clear within contexts where they accredit more for external validation than they reform internally. In cases such as these, hospitals may become fully certified without completely incorporating active enhancement into their culture. Resource limitations as well as external pressures in regions like the West Bank may come to exist. Therefore, in effect, the pursuit of accreditation becomes more of a compliance-focused activity, and not so much a catalyst for cultural and systemic change.

These findings highlight the idea that accreditation on its own cannot ensure that hospitals are ready for LSS; without actively building a supportive culture in which psychological safety exists, in which staff engage, share learning, and leaders align; the efforts of accreditors may remain surface-level. To achieve sustainable and meaningful improvement, there is a need to adopt an integrated approach, aligning JCI accreditation with cultural development since JCI accreditation helps to standardize the quality of healthcare.

5.2.6 The Role of Accreditation in Enhancing Hospital Readiness (H11)

The significant difference in readiness levels between JCI-accredited and non-accredited hospitals suggests that accreditation status may act as an enabler for LSS adoption. JCI-accredited hospitals likely benefit from structured quality frameworks, established process standards, and a stronger culture of CI, which in turn enhance their readiness for LSS implementation.

These results align with previous findings emphasizing the role of accreditation in fostering quality-oriented environments (e.g., Tomblin, 2021; Hussein et al., 2021). The presence of JCI requirements may indirectly elevate staff training, leadership commitment, and resource allocation, all of which are key LSS readiness factors.

5.3 Practical Implications

One of the most critical factors for LSS implementation is the active leadership engagement. LSS initiatives have to be visibly integrated into the organizational goals and all the day-to-day operations by hospital leaders. More than support, this requires leadership to promote LSS values and practices, proactively serve as role models, and they have to commit to CI. For this, leadership development programs should incorporate training explicitly on LSS principles and tools as well as on success stories. A top-down

approach is ensured when organizations embed LSS into the leadership framework, this will foster unity and responsibility everywhere.

At the same time, continued training and capacity building are important in order to ensure healthcare staff at all levels understand LSS concepts and can apply them effectively. A structured training program tailored to staff roles will give them necessary knowledge along with skills. This should include awareness campaigns that highlight the benefits as well as real-world applications of LSS in healthcare settings in addition to formal training sessions. If institutions establish internal platforms for knowledge sharing, such as discussion forums, case study repositories, or learning circles, these platforms can reinforce learning then help systematize a culture of quality together with CI. These efforts may tackle popular opposition by clarifying LSS and displaying pertinence to everyday work.

An additional practical consideration is investing in the infrastructure required to facilitate the deployment of LSS. While improvement projects need sustainability along with effectiveness from healthcare organizations, hospitals have to allocate appropriate resources needed for every initiative. This includes investing within modern information systems that they enable data-based decision-making, hiring of personnel with LSS expertise or training of them, and specifying a dedicated budget for quality improvement initiatives. Even the best LSS projects may encounter difficulties delivering measurable outcomes or achieving sustained progress if lacking these foundational elements.

Also, the hospital should seek to build up a collaborative culture. Departments participate, and teams coordinate effectively when processes improve. When we give encouragement to open communication, share in problem-solving duties, avoid having a no-balm culture, and collaborate across functions, we foster integration across all departments, and this supports efforts that are more cohesive. From hospitals promoting environments within which departments pursue common goals will come smoother LSS tool implementation along with greater collective results ownership.

Staff engagement may greatly improve with performance incentives, whether monetary or non-monetary. This engagement in turn improves quality-improvement efforts. Programs of recognition may strengthen behaviors that are desirable and show hospital’s dedication. When staff concretely reward contributions in LSS projects or publicly appreciate them, they are more likely to stay motivated to participate in future initiatives. Such incentives can be important in sustaining momentum over time and embedding LSS into the organizational culture.

5.4 Theoretical Implications

This study offers several important theoretical contributions particularly within the Palestinian context of healthcare to the comprehension of organizational change and quality improvement.

It advances organizational change theory since it highlights how staff readiness and awareness influence the overall adoption of LSS, especially within environments facing resource and cultural barriers. It draws from Diffusion of Innovations Theory and also identifies key factors that are shaping the way LSS is perceived in addition to adopted across healthcare roles.

Research supports Human Capital Theory by focusing on the need for staff directed training and education to drive successful change. While considering organizational culture indicates the way that communication regulations and hierarchical structures influence readiness, organizational components align and reflect a systems theory perspective for LSS to be rooted.

Finally, the study explores how perceptions and attitudes form staff willingness to participate in quality initiatives. It also contributes to theories of motivation as well as employee engagement. These findings improve multiple theoretical frameworks and are context-specific in transformation of healthcare.

5.4 Recommendations and Future Research

Based on the study findings, the following practical recommendations are proposed and directed toward hospital leadership and policymakers. First and foremost, LSS principles should be embedded within the hospital's strategic goals and operational plans, ensuring alignment across departments. Department heads should allocate resources for ongoing, role-specific training programs and ensure these are evaluated against performance metrics, rather than being treated as isolated workshops. Clear responsibilities should be assigned to leadership teams to monitor LSS implementation progress, and tie performance indicators to quality improvement metrics.

Hospital top management is also encouraged to create cross-functional LSS teams with clear responsibilities and improve internal communication channels to ensure all staff receive consistent messaging about improvement goals. Leadership should support the development of real-time monitoring systems that capture operational performance

and empower staff to use this data for rapid-cycle improvement. In the case of JCI-accredited hospitals, accreditation feedback should be used as a springboard to further embed LSS practices, linking standards compliance with long-term quality strategies.

Future research on LSS in healthcare should aim to address the limitations of the current study and deepen the understanding of factors influencing successful implementation. One key recommendation is to conduct long-term studies to better understand how LSS efforts affect readiness, staff involvement, and outcomes overtime.

Additionally, incorporating qualitative methods such as in-depth interviews or focus groups could provide deeper insights into the organizational culture and staff perceptions that quantitative surveys alone may not fully capture.

Finally, future studies should also investigate how digital transformation and technology readiness affect the implementation and success of LSS methodologies. Exploring these areas will contribute to a more comprehensive understanding of LSS adoption in complex healthcare environments.

5.5 Conclusion

This study identified key factors influencing hospital readiness for LSS implementation in the West Bank. Among the organizational predictors, management commitment, organizational culture, and resources and infrastructure were found to significantly influence readiness. In contrast, training and education, communication and collaboration, and current process evaluation did not show direct statistical significance.

While training and education significantly increased awareness of LSS**,** the indirect effect through awareness on readiness was not statistically supported**,** suggesting that training alone may raise knowledge levels but is insufficient to generate organizational preparedness unless paired with actionable implementation strategies.

Although JCI accreditation did not moderate the relationship between organizational culture and readiness in the structural model, the independent-samples t-test results revealed that JCI-accredited hospitals demonstrated significantly higher readiness levels overall. This suggests that accreditation may serve as a facilitator of hospital preparedness when supported by broader institutional commitment and engagement.

In conclusion, LSS implementation in the West Bank's healthcare sector requires a coordinated effort involving leadership support, investment in capacity building, and

fostering a culture of collaboration. These findings provide a practical roadmap for policymakers and hospital administrators to improve operational efficiency and quality of care.

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Appendices

Appendix A: Study questionnaire in English

Arab American University
Faculty of Graduate Studies

Assessing Readiness Factors for LSS Adoption in West Bank Hospitals: A Cross-Sectional Study

This study mainly aims to assess the extent of knowledge among hospital staff in West Bank, both governmental and private, regarding the principles of LSS (LSS) and to identify the related factors that directly affect the implementation of LSS (LSS) principles in West Bank hospitals. LSS is a continuous improvement methodology that enhance the quality of services provided in various sectors, as it focuses on the optimal use of resources and reducing errors resulting from any process to ensure providing the best service at the lowest possible cost.

This study complements the requirements for obtaining a master's degree in the (Quality Management in Healthcare) program from the Arab American University.

In order to achieve this, I request your help in providing honest, accurate, and objective answers to the questions contained in this questionnaire, which depend on your experience, bearing in mind that filling out the questionnaire takes approximately 10 minutes.

Emphasizing that all data will be treated confidentially and will only be used for scientific research purposes. If you have any questions, you can email me at the attached email.
Your participation in answering this survey is appreciated.

Best Regards.

Researcher: Dua'a Abdalgani **Email:** duaa.abdalgany@gmail.com

Part 1: Sociodemographic Characteristics

Job Title: **( ) Top Management position ( ) Human Resources Manager/ Employee** **( ) Head/ Officer of Quality Dept** **( ) Physician ( ) Nurse ( ) Resident Doctor ( ) Laboratory/ Specialist** **( ) Pharmacist ( ) Dietitian** **( ) Other** (Please specify): _____	
Please answer the following questions by butting (X) in the appropriate place:	
Age (years)	( ) 20-24 ( ) 25-29 ( ) 30-34 ( ) ≥ 35
Gender	( ) Male ( ) Female
Level of Education	( ) Diploma ( ) Bachelor ( ) Master ( ) Doctorate/ Specialist
Work Experience in this hospital	( ) < 5 years ( ) 6-10 years ( ) 11-15 years ( ) ≥ 16 years
Hospital has JCI Accreditation?	( ) Yes ( ) No

Part 2: Knowledge & Awareness assessment regarding LSS (LSS):

This part includes 15 questions distributed on 2 sections that related to knowledge & awareness assessment regarding LSS (LSS). Based on your extent of knowledge, please put (X) inside the box that expresses your degree of agreement with each of the following statements.

Section 1: LSS Knowledge Assessment
1.Are you familiar with LSS? ( )Yes, Lean Thinking ( )Yes, Six Sigma ( )Yes, LSS ( )No
2.Have you or your team received formal training on LSS? ( )Yes ( )No
3.Has your hospital considered using LSS methodologies? ( )Yes, Lean Thinking ( )Yes, Six Sigma ( )Yes, LSS ( )No ( ) I don't know
4.How important do you consider improving healthcare processes? ( ) Not important ( )Slightly important ( ) Moderately important ( )Important ( ) Very important
5.In your opinion, which healthcare functions are best suited for LSS methodologies? o Supportive functions (e.g., laundry, accounting, transport) o Indirect patient processes (e.g., pharmacy, laboratory) o Direct patient processes (e.g., treatment, diagnosis) o Other
6.Does your hospital currently have or has it ever had LSS initiatives or projects? ( )Yes ( )No ( )I don't know

7.How many LSS initiatives or projects has your organization undertaken?

- o More than 10
- o 6-10
- o 2-5
- o One
- o None
- o I don't know

8.What is the initial reason for adopting LSS in your hospital?

- o Cost saving/increasing productivity
- o Improving quality of care/ reducing errors
- o Improve patient satisfaction
- o Other

9.If any, what lean/six sigma methods have you used in your department/unit?

- o Value stream map
- o Kaizen
- o 5S
- o Poka-yoke
- o Kanban
- o SMED
- o TPM
- o Andon
- o Jidoka
- o Heijunka
- o Visual control
- o SIPOC diagram
- o Measurement system analysis GR&R
- o FMEA
- o Ishikawa diagram
- o Cause-effect matrix
- o Normality and capability analysis
- o Hypotheses testing t, z, p and/or X2
- o ANOVA, regression analysis, and/or contingency tables
- o Control charts (x-R, x-S, MR, p, np, c, u, Cusum and/or Ewma)
- o None of the above

10.Does your hospital employ a LSS expert or facilitator?

( )Yes ( )No ( )I don't know

Section 2: Awareness of LSS Impact

Please put (X) inside the box that expresses to what extent do you agree with the following statements?

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
LSS reduces waste and process variability					
LSS improves service quality					
LSS changes the hospital culture					
LSS improves patient' satisfaction					

LSS reduces errors and aids in cost control					

Part 3: Readiness Factors for LSS (LSS) Implementation:

This part includes 6 sections which contains questions that related to the factors affecting hospital's readiness to adopt LSS. Based on your experience of work, please put (X) inside the box that expresses your degree of agreement with each of the following statement:

1.Management Commitment and Leadership					
Statement	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The hospital is able to link the continuous improvement initiatives with the overall strategy					
We have a system that links improvement initiatives results to the bottom line and to the long-term strategic goals.					
The hospital leadership encourages new ideas from all employees					
The hospital leadership provides direction and support for all departments and units					
The hospital management builds confidence through good communication between employees and provide incentives for improvement					
The hospital management lead and take responsibility for quality projects and improvement					
The hospital's finance team estimates LSS savings/benefits well before implementation					
Quality-related training is given to managers, supervisors and all workers throughout the hospital					
The quality ideas are clear, concise and well understood across all hospital from the lowest levels of employees to the executive leadership					
2. Organizational Culture					
Statement	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
There is an effective communication between all hospital departments					
There is a positive environment for change among all departments					
There is an effective use of technology throughout all hospital processes					
The hospital gives value for customers following a patient-centered approach					

The hospital encourages a working environment that emphasizes patient safety					
The hospital support patient respect, involvement and engagement					
The hospital leadership assign an oversight expert committee to coordinate the LSS initiatives					
3. Training and Education					
Statement	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
Hospital staff are aware of LSS principles and their benefits					
Regular training from experts/ specialists is provided to empower employee's knowledge and skills					
Hospital staff are sufficiently willing to adopt new quality improvement tools and methods					
Hospital workers have the needed support from top management					
It is understood that the LSS is a tool set that helps the hospital achieve business goals while creating a high-performing teams and improving employee satisfaction					
Regular sessions are arranged to refresh the new information in the field of LSS from experts					
4. Resources and Infrastructures					
Statement	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
Experts' personnel are dedicated to guide caregiver's teams					
Staff have the required skills to implement process improvement initiatives using LSS					
Key decision-makers in the hospital are knowledgeable about LSS principles					
The hospital allocated a budget specifically for LSS implementation					
The current IT systems effectively support continuous process improvement initiatives					
Data collection and reporting tools available to monitor and measure process performance in real-time					
The hospital balance daily operational demands with time needed for LSS initiatives					
The hospital collaborates with external consultants or other hospitals for LSS implementation					

5. Communication and Collaboration					
Statement	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The hospital units collaborate respectfully and effectively from each employee to provide the perfect patient care					
There is a good flow of communication, sharing of information and periodic meetings between hospital's departments					
Hospital's leadership and top management encourage and promote worker involvement, teamwork & collaboration					
Every worker in the hospital is accountable and responsible to guarantee learning from mistakes					
Motivating factors such as promotions, monetary benefits, skill development, and decision-making involvement are considered from top management					
6. Current Process					
Statement	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
The hospital has shared vision and clear understanding to LSS outcomes					
Employees who contribute to the quality improvement process are rewarded by the hospital					
All hospital improvement initiatives are reviewed on a routine basis					
To ensure patient safety, the hospital focuses on reducing the incidence of errors and the impact of medical care errors					

Part 4: Perceived Challenges and Enablers to LSS Implementation

1. In your opinion, what are the primary barriers to implementing LSS in your hospital? *(Select all that apply)*
   - ( ) Lack of leadership support
   - ( ) Insufficient training
   - ( ) Resistance to change
   - ( ) Budget constraints
   - ( ) Insufficient time for projects
   - ( ) Lack of good flow of information
   - ( ) Other (Please specify): _____
2. How challenging is it to integrate LSS into daily operations?
   - ( ) Very Challenging
   - ( ) Somewhat Challenging
   - ( ) Neutral
   - ( ) Not Very Challenging

( ) Not Challenging at All

3. What were the enabling factors for lean and/or six sigma initiatives/project?
   ( ) Leadership support
   ( ) Sufficient training
   ( ) Committed employees
   ( ) Good financial resources
   ( ) Sufficient time for projects
   ( ) Good flow of information
   ( ) Other (Please specify): _____
4. What are (in your opinion) the reasons for resistance to lean and/or six sigma initiative/ projects?
   ( ) Tired of development projects
   ( ) Lack of knowledge
   ( ) The will to maintain old ways to do things
   ( ) Discrepancies between professional groups
   ( ) Negative experiences from previous lean/six sigma initiatives
   ( ) Other (Please specify): _____

Part 5: Recommendations

- Please share any additional comments or suggestions regarding the readiness for LSS implementation in your hospital

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Appendix B: Study questionnaire in Arabic

الجامعة العربية الأمريكية

كلية الدراسات العليا

عزيزي/ عزيزتي المشارك/ ة:

في إطار تقديم رسالة بحث ماجستير بعنوان: "تقييم عوامل الاستعداد لتبني منهجية لين ستة سيجما في مستشفيات الضفة الغربية: دراسة مقطعية" تقوم الباحثة دعاء عبد الغني من برنامج (إدارة الجودة في الرعاية الصحية) في كلية الدراسات العليا في الجامعة العربية الأمريكية كجزء من أطروحتها بإجراء بحث ميداني لتقييم عوامل الاستعداد لتنفيذ "منهجية ليين ستة سيغما" في القطاع الصحي في فلسطين من خلال استخدام استبانة البحث المرفقة.

تهدف هذه الدراسة بشكل رئيسي إلى تقييم مدى معرفة موظفي المستشفيات في الضفة الغربية، الحكومية والخاصة، بمبادئ منهجية "ليين ستة سيغما"، وتحديد العوامل المرتبطة المؤثرة بشكل مباشر على تنفيذ مبادئ "ليين ستة سيغما" في مستشفيات الضفة الغربية. منهجية "ليين ستة سيغما" هي منهجية تحسين مستمر تساعد في تطوير مستوى الخدمات المقدمة في مختلف القطاعات، حيث تركز على الاستخدام الأمثل للموارد وتقليل الأخطاء الناجمة عن أية عملية أو إجراء لضمان تقديم أفضل خدمة بأقل تكلفة ممكنة.

إن الأشخاص المؤهلين للتعامل مع هذه الاستبانة هم موظفو المستشفيات في كلا القطاعين: الإداري والطبي وعليه يرجى مساعدتكم في تقديم إجابات صادقة ودقيقة وموضوعية على الأسئلة الموجودة في هذه الاستبانة، حيث سيتم استخدام كافة البيانات لأغراض بحثية فقط، مع العلم أن ملء الاستبانة يستغرق حوالي ١٠-١٥ دقيقة.

إذا كان لديكم أي أسئلة أو استفسارات، يمكنكم التواصل عبر البريد الإلكتروني المرفق. نقدر مشاركتكم في الإجابة على هذه الاستبانة.

مع أطيب التحيات

الباحثة: دعاء عبد الغني، طالبة ماجستير/ برنامج (إدارة الجودة في الرعاية الصحية) / كلية الدراسات العليا / الجامعة العربية الأمريكية

Email: duaa.abdalgany@gmail.com

قمت بقراءة ملخص الرسالة وأوافق على المشاركة الطوعية فيها التوقيع: .....

أولاً: البيانات الديموغرافية

يرجى الإجابة عن الأسئلة بوضع (x) في المكان المناسب:	
المسمى الوظيفي: ( )وظيفة في الإدارة العليا ( ) مدير/ موظف في الموارد البشرية ( )رئيس قسم / موظف في قسم الجودة ( )طبيب ( ) طبيب مقيم ( ) ممرض ( ) أخصائي مختبر ( )صيدلي ( ) أخصائي تغذية ( )غير ذلك (حدد): _____	
العمر	( ) ٢٠- ٢٤ ( ) ٢٥-٢٩ ( ) ٣٠-٣٤ ( ) ٣٥ فأعلى
الجنس	( )ذكر ( )أنثى
التحصيل الأكاديمي	( ) دبلوم ( ) بكالوريوس ( ) ماجستير ( ) دكتوراة /أخصائي
سنوات الخبرة في مكان العمل الحالي	( ) أقل من٥ سنوات ( ) ٦-١٠ سنوات ( ) ١١-١٥ سنة ( ) ١٦ سنة فأعلى
هل المستشفى حاصل على اعتماد الـ JCI؟	( ) نعم ( ) لا

ثانياً: تقييم المعرفة والوعي بشأن منهجية "ليين ستة سيغما"

يتضمن هذا الجزء 15 سؤالًا موزعة على قسمين يتعلقان بتقييم المعرفة والوعي بمنهجية "ليين ستة سيغما". يرجى الإجابة عن الأسئلة بوضع (x) على الخيار الذي يعبر عن درجة موافقتك مع كل من العبارات التالية

القسم الأول: تقييم المعرفة بمنهجية "ليين ستة سيغما"	
.1	**هل لديك علم مسبق بمنهجية "ليين ستة سيغما"؟**
( )نعم، تفكير ليين ( ) نعم، ستة سيغما ( ) نعم، ليين ستة سيغما ( ) لا	
.2	**هل تلقيت أنت أو فريقك تدريباً رسمياً على منهجية "ليين ستة سيغما"؟**
o	نعم
o	لا
.3	**هل يعتمد مستشفاك استخدام منهجيات "ليين ستة سيغما"؟**
( )نعم، تفكير ليين ( ) نعم، سيغما ( ) نعم، ليين ستة سيغما ( ) لا. ( ) لا أعلم	
.4	**ما مدى أهمية تحسين الإجراءات في الرعاية الصحية بالنسبة لك؟**
( )غير مهم ( ) قليل الأهمية ( ) متوسط الأهمية ( ) مهم ( ) مهم جداً	
.5	**برأيك، ما هي الوظائف في الرعاية الصحية التي تناسب أفضل تطبيق منهجيات "ليين ستة سيغما"؟**
o	الوظائف الداعمة (مثل: الغسيل، المحاسبة، التنقلات)
o	العمليات غير المباشرة للمرضى (مثل: الصيدلة، المختبر)
o	العمليات المباشرة للمرضى (مثل: العلاج، التشخيص)
o	جميع ما ذكر
o	غير ذلك
.6	**هل ينفذ مستشفاك حالياً (أو نفذ سابقًا) أي مبادرات أو مشاريع لتطبيق "ليين ستة سيغما"؟**
o	نعم
o	لا
o	لا أعلم
.7	**كم عدد المبادرات أو المشاريع التي نفذها المستشفى في تطبيق "ليين ستة سيغما"؟**
o	أكثر من 10
o	من 6 إلى 10
o	من 2 إلى 5
o	واحدة

o	لم تنفذ أي مبادرة تحسين
o	لا أعلم
8.	**ما هو السبب الرئيسي لاعتماد منهجية "ليين ستة سيغما" في مستشفاك؟**
o	توفير التكاليف / زيادة الإنتاجية
o	تحسين جودة الرعاية / تقليل الأخطاء
o	تحسين رضا المرضى
o	غير ذلك
9.	**ما هي أدوات "ليين ستة سيغما" التي استخدمتها في قسمك؟**
o	Value stream map
o	Kaizen
o	5S
o	Poka-yoke
o	Kanban
o	SMED
o	TPM
o	Andon
o	Jidoka
o	Heijunka
o	Visual control
o	SIPOC diagram
o	Measurement system analysis GR&R
o	FMEA
o	Ishikawa diagram
o	Cause-effect matrix
o	Normality and capability analysis
o	Hypotheses testing t, z, p and/or X2
o	ANOVA, regression analysis, and/or contingency tables
o	Control charts (x-R, x-S, MR, p, np, c, u, Cusum and/or Ewma)
o	لا شيء مما ذكر
10.	**هل يعمل مستشفاك مع خبير أو مختص في منهجية "ليين ستة سيغما"؟**
o	نعم
o	لا
o	لا أعلم

القسم الثاني: الوعي بتأثير منهجية "ليين ستة سيغما"

يرجى الإجابة عن الأسئلة بوضع (x) على الخيار الذي يعبر عن درجة موافقتك مع كل من العبارات التالية

الفقرة	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة
منهجية "ليين ستة سيغما" تقلل من الهدر والتفاوت في الإجراءات					
منهجية "ليين ستة سيغما" تحسن جودة الخدمة					
منهجية "ليين ستة سيغما" تغير ثقافة المستشفى					
منهجية "ليين ستة سيغما" تحسن رضا المرضى					
منهجية "ليين ستة سيغما" تقلل الأخطاء وتساعد في التحكم بالتكاليف					

ثالثاً: عوامل الجهوزية لتطبيق منهجية ليين سيغما

يتضمن هذا الجزء 6 أقسام تحتوي على أسئلة تتعلق بالعوامل التي تؤثر على استعداد المستشفى وجهوزيته لاعتماد منهجية "ليين ستة سيغما".

يرجى الإجابة عن الأسئلة بوضع (x) على الخيار الذي يعبر عن درجة موافقتك مع كل من العبارات التالية:

1. الالتزام الإداري والقيادة					
الفقرة	**لا أوافق بشدة**	**لا أوافق**	**محايد**	**أوافق**	**أوافق بشدة**
المستشفى قادر على ربط مبادرات التحسين المستمر بالاستراتيجية العامة					
لدينا نظام يربط نتائج مبادرات التحسين بالنتائج المالية والأهداف الاستراتيجية طويلة المدى					
الإدارة العليا في المستشفى تشجع الأفكار الجديدة من جميع الموظفين					
الإدارة العليا في المستشفى تقدم التوجيه والدعم لجميع الأقسام والوحدات					
إدارة المستشفى تبني الثقة من خلال التواصل الجيد بين الموظفين وتقديم الحوافز للتحسين					
تتولى إدارة المستشفى قيادة ومسؤولية مشاريع الجودة والتحسين					
قسم المالية في المستشفى يقدّر التوفير والفوائد الناتجة عن "منهجية ليين ستة سيغما" قبل التنفيذ					
يتم تقديم ورشات تدريب متعلقة بالجودة للمديرين والمشرفين وجميع العاملين في المستشفى					
أفكار الجودة واضحة وموجزة ومفهومة جيداً لدى جميع المستويات في المستشفى، من الموظفين إلى القيادة التنفيذية					
2. الثقافة العامة في المنظمة					
الفقرة	**لا أوافق بشدة**	**لا أوافق**	**محايد**	**أوافق**	**أوافق بشدة**
يوجد تواصل فعال بين جميع أقسام المستشفى					
تتوفر بيئة إيجابية داعمة لتقبّل التغيير بين جميع الأقسام					
يتم استخدام التكنولوجيا بفعالية في جميع مهام عمل المستشفى					
يعطي المستشفى أولوية للعملاء (المرضى وذويهم) باتباع نهج يركز على المريض واحتياجاته					

يشجع المستشفى على خلق بيئة عمل تركز على سلامة المرضى					
يدعم المستشفى احترام المرضى ومشاركتهم واندماجهم في عملية الرعاية					
تعين إدارة المستشفى لجنة إشرافية من الخبراء لتنسيق مشاريع "ليين ستة سيغما"					
3. التدريب والتعليم					
الفقرة	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة
موظفو المستشفى على دراية بمبادئ "ليين ستة سيغما" وفوائدها					
يتم توفير تدريب منتظم من قبل خبراء مختصين لتعزيز معلومات الموظفين ومهاراتهم					
موظفو المستشفى مستعدون بما فيه الكفاية لاعتماد أدوات وأساليب تحسين الجودة الجديدة					
يتمتع العاملون في المستشفى بالدعم الكافي من الإدارة العليا					
تساعد "منهجية ليين ستة سيغما" المستشفى على تحقيق أهدافه، بناء فريق قوي، وتحسين رضا الموظفين					
يتم تنظيم جلسات منتظمة لتحديث المعلومات الجديدة في مجال "ليين ستة سيغما" من قبل المختصين					
4. الموارد والبنية التحتية					
الفقرة	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة
يوظف المستشفى مختصين لتقديم الإرشاد للطواقم العاملة					
يتمتع الموظفون بالمهارات المطلوبة لتنفيذ مشاريع تحسينية باستخدام "ليين ستة سيغما"					
صناع القرار الرئيسيون في المستشفى على دراية بمبادئ "ليين ستة سيغما"					
خصص المستشفى ميزانية مخصصة لتنفيذ منهجية "ليين ستة سيغما"					
الأنظمة التقنية الحالية تدعم مبادرات التحسين المستمر					
تتوفر أساليب جمع البيانات وإعداد التقارير لمتابعة وتقييم الأداء في الوقت الفعلي					
يوازن المستشفى بين متطلبات العمل اليومية والوقت اللازم لتنفيذ مبادرات "ليين ستة سيغما"					

يتعاون المستشفى مع مستشارين خارجيين أو مستشفيات أخرى لتنفيذ "ليين ستة سيغما"					
5. التواصل والتعاون					
الفقرة	**لا أوافق بشدة**	**لا أوافق**	**محايد**	**أوافق**	**أوافق بشدة**
تتعاون أقسام المستشفى بشكل محترم وفعّال من كل موظف لتقديم أفضل رعاية للمرضى					
هناك تواصل فعال وتبادل للمعلومات، واجتماعات منتظمة بين أقسام المستشفى					
تشجع الإدارة العليا للمستشفى وتعزز من مشاركة الموظفين، والعمل الجماعي، والتعاون					
يتحمل كل موظف في المستشفى المسؤولية لضمان التعلم من الأخطاء					
تدعم الإدارة العليا المحفزات مثل الترقيات، والمكافآت المالية، وتطوير المهارات، والمشاركة في اتخاذ القرارات					
6. العملية الحالية					
الفقرة	**لا أوافق بشدة**	**لا أوافق**	**محايد**	**أوافق**	**أوافق بشدة**
يمتلك المستشفى رؤية مشتركة وفهم واضح لنتائج "ليين ستة سيغما"					
يتم مكافأة الموظفين المساهمين في عملية تحسين الجودة من قبل المستشفى					
يتم مراجعة جميع مشاريع تحسين المستشفى بشكل دوري					
يركز المستشفى على تقليل حدوث الأخطاء ومضاعفات الأخطاء الطبية لضمان سلامة المرضى					

رابعاً: التحديات والعوامل الداعمة لتطبيق منهجية "ليين ستة سيغما"

1 . ما هي العوائق الرئيسية لتنفيذ "منهجية ليين ستة سيغما" في مكان عملك؟ (اختر كل ما ينطبق)

( )عدم دعم الإدارة
( )التدريب غير الكافي
( )رفض التغيير
( )قيود الميزانية
( )عدم وجود وقت كافٍ للمشاريع
( )نقص في مشاركة المعلومات
( )غير ذلك (اذكرها----------)

2 . ما مدى صعوبة دمج "منهجية ليين ستة سيغما" في الإجراءات اليومية في المستشفى؟ (اختر كل ما ينطبق)

( )صعب جداً
( )صعب إلى حد ما
( )محايد
( )ليس صعباً جداً
( )ليس صعباً على الإطلاق

3 . ما هي العوامل الداعمة لتنفيذ "منهجية ليين ستة سيغما" في مكان عملك؟ (اختر كل ما ينطبق)

( )دعم الإدارة
( )التدريب الكافي
( )الموظفون الملتزمون
( )الموارد المالية الكافية
( )الوقت الكافي للمشاريع
( )مشاركة جيدة للمعلومات
( )غير ذلك (اذكرها----------)

4. ما هي أسباب رفض التغيير وتقبُّل تطبيق "منهجية ليين ستة سيغما" في تحسين الجودة في مكان عملك؟ (اختر كل ما ينطبق)

( )التعب من مشاريع التحسين
( )نقص المعرفة
( )الرغبة في الحفاظ على الطرق التقليدية للعمل
( )تفاوت الكفاءات بين الطواقم المهنية
( )تجارب سلبية من مبادرات "منهجية ليين ستة سيغما" السابقة
( )غير ذلك (اذكرها----------)

خامساً: التوصيات

يرجى مشاركة أي تعليقات أو اقتراحات إضافية بخصوص جهوزية مستشفاكم لتنفيذ منهجية **"**ليين ستة سيغما**"**

Appendix C: Details of Questionnaire Constructs

Variable	Items		Source
Staff Perceptions & Awareness	Staff Perceptions about LSS		Peimbert-García et al., (2019)
	Awareness of LSS Impact (AA)	LSS reduces waste and process variability (AA1)	Adapted from (Sreedharan et al., 2016)
		LSS improves service quality (AA2)	
		LSS changes the culture of the hospital (AA3)	
		LSS improves patient' satisfaction (AA4)	
		LSS reduces defects and aids in cost control (AA5)	
Management Commitment & Leadership (ML)	The hospital is able to link the continuous improvement initiatives with the overall strategy (RL2)		Adapted from Sreedharan et al. (2016)
	We have a system that links improvement initiatives results to the bottom line and to the long-term strategic goals (ML1)		
	The hospital leadership encourages new ideas from all employees (ML2)		Awang et al. (2022)
	The hospital leadership provides direction and support for all departments and units (ML3)		
	The hospital management builds confidence through good communication between employees and provides incentives for improvement (ML4)		V. Vaishnavi and M. Suresh (2020b)
	The hospital management lead and take responsibility for quality projects and improvement (ML5)		Adapted from Sreedharan et al. (2016)
	The hospital's finance team estimates LSS savings/benefits well before implementation (ML7)		
	Quality-related training is given to managers, supervisors and all workers throughout the hospital (ML7)		
	The quality ideas are clear, concise and well understood across all hospital from the lowest levels of employees to the executive leadership (ML8)		
Organizational Culture (OC)	There is an effective communication between all hospital departments (RL3)		Awang et al. (2022)
	There is a positive environment for change among all departments (OC1)		Adapted from V. Vaishnavi and M. Suresh (2020b)
	There is an effective use of technology throughout all hospital processes (OC2)		
	The hospital gives value for customers following a patient-centered approach (RL4)		Awang et al. (2022)
	The hospital encourages a working environment that emphasizes patient safety (OC3)		Adapted from Rosa et al. (2024)
	The hospital support patient respect, involvement and engagement (OC4)		Narayanamurthy et al. (2018)
	The hospital leadership assign an oversight expert committee to coordinate the LSS initiatives (OC5)		Adapted from V. Vaishnavi and M. Suresh (2020b)
Training and Education (TE)	Hospital staff are aware of LSS principles and their benefits (TE1)		Awang et al. (2022)
	Regular training from experts/ specialists is provided to empower employee's knowledge and skills (TE2)		Adapted from V. Vaishnavi and M. Suresh (2020a)
	Hospital staff are sufficiently willing to adopt new quality improvement tools and methods (RL5)		Author's effort based on Awang et al. (2022)
	Hospital workers have the needed support from top management (TE3)		Awang et al. (2022)
	It is understood that the LSS is a tool set that helps the hospital achieve business goals while creating a high-performing work force and improving employee satisfaction (TE4)		Adapted from Sreedharan et al. (2016)
	Regular sessions are arranged to refresh the new information in the field of LSS from experts (TE5)		Adapted from V. Vaishnavi and M. Suresh (2020a)
Resources & Infrastructures (RI)	Experts' personnel provide guidance to caregiver's teams (RI1)		Narayanamurthy et al. (2018), Anzum & Kibria (2024)
	Staff have the required skills to implement process improvement initiatives using LSS (RI2)		Adapted from V. Vaishnavi and M. Suresh (2020a)
	Key decision-makers in the hospital are knowledgeable about LSS principles (RI3)		Awang et al. (2022)
	The hospital allocated a budget specifically for LSS implementation (RL6)		Adapted from V. Vaishnavi and M. Suresh (2020a)
	The current IT systems effectively support continuous process improvement initiatives (RL7)		

	Data collection and reporting tools available to monitor and measure process performance in real-time (RI4)	Adapted from Rosa et al. (2024)
	The hospital balance daily operational demands with time needed for LSS initiatives (RL8)	Author's effort
	The hospital collaborates with external consultants or other hospitals for LSS implementation (RI5)	Adapted from Rosa et al. (2024)
Communication & Collaboration (CC)	The hospital units collaborate respectfully and effectively from each employee to provide the perfect patient care (CC1)	Awang et al. (2022)
	There is a good flow of communication, exchange of information and periodic meetings between hospital's departments (CC2)	
	Hospital's leadership and top management encourage and promote worker involvement, teamwork & collaboration (CC3)	Narayanamurthy et al. (2018)
	Every worker in the hospital takes accountability and responsibility to guarantee learning from mistakes (CC4)	Awang et al. (2022)
	Motivating factors such as promotions, recognition, monetary benefits, skill development, and decision-making involvement are considered from top management (CC5)	Adapted from Rosa et al. (2024)
Current Process (CP)	The hospital has shared vision and clear sense to LSS outcomes (RL1)	Noori (2015)
	Employees who contribute to the quality improvement process are rewarded by the hospital (CP1)	Adapted from Rosa et al. (2024)
	All hospital improvement initiatives are reviewed on a routine basis (CP3)	
	To ensure patient safety, the hospital focuses on reducing the incidence of errors and the impact of medical care errors (CP2)	
Perceived Challenges and Enablers	In your opinion, what are the primary barriers to implementing LSS in your hospital? How challenging is it to integrate LSS into daily operations? What were the enabling factors for lean and/or six sigma initiatives/project? What are (in your opinion) the reasons for resistance to lean and/or six sigma initiative/ projects?	Author's effort based on Vaishnavi and Suresh (2020b), Peimbert-García et al., (2019)

Source: Author's effort

Appendix D: List of Research Instrument Judge

Expert	Position
Dr. Ashraf Almimi	Assistant Professor, Arab American University Middle East Regional Director and Director Consultant at Process Management International
Dr. Yahya Saleh	Assistant Professor, An Najah National University
Dr. Nidal Dweikat	Assistant Professor, An Najah National University

Appendix E: IRB Approval Form

Arab American University
Institutional Review Board - Ramallah

الجامعـــة العربيـــة الأمريكيـــة
مجلس اخلاقيات البحث العلمي – رام الله

IRB Approval Letter

Study Title: "Assessment of Readiness Factors for Lean Six Sigma Implementation in the West Bank Hospitals: A Cross- sectional Study".

Submitted by: Dua'a Hefthi Rushdi Abdalagani

Date received: 2nd December 2024

Date reviewed: 2nd December 2024

Date approved: 2nd December 2024

Your Study titled **"Assessment of Readiness Factors for Lean Six Sigma Implementation in the West Bank Hospitals: A Cross- sectional Study"** with the code number **"R-2024/A/170/N"** was reviewed by the Arab American University Institutional Review Board - Ramallah and it was approved on the 2nd of December 2024.

Sajed Ghawadra, PhD
IRB-R Chairman
Arab American University of Palestine

الجامعة العربية الأمريكية - فلسطين
مجلس اخلاقيات البحث العلمي - رام الله
IRB-R
ARAB AMERICAN UNIVERSITY-PALESTINE
INSTITUTIONAL REVIEW BOARD - RAMALLAH

General Conditions:

1. Valid for 6 months from the date of approval.
2. It is important to inform the IRB-R with any modification of the approved study protocol.
3. The Bord appreciates a copy of the research when accomplished.

رام الله – فلسطين

Tel: 02-294-1999 **E-Email:** IRB-R@aaup.edu **Website:** www.aaup.edu

Appendix F: PMoh, PMC, NNUH, and IAH Approval

State of Palestine
Ministry of Health
Education in Health and Scientific
Research Unit

دولة فلسطين
وزارة الصحة
وحدة التعليم الصحي
والبحث العلمي

Ref.: .....
Date:.....

الرقم: ٢٤٧٧/١٦٢/٠٠
التاريخ: ١٨/٠٤/٢٠٢٢/٠٠

الأخ مدير عام الادارة العامة للمستشفيات المحترم،،،

تحية واحترام،،

الموضـــوع: تسهيل مهمة بحث

يرجى تسهيل مهمة الطالبة: دعاء حفظي رشدي عبد الغني – برنامج ماجستير ادارة الجودة– الجامعة العربية الامريكية، بعنوان:

- تقييم العوامل المؤثرة على جهوزية مستشفيات الضفة الغربية لتطبيق منهجية للتطوير: دراسة مقطعية lean six "sigma

حيث ستقوم الطالبة بجمع معلومات حول موضوع البحث من خلال استبانة الدراسة، وذلك في:

- مستشفى جنين – مستشفى عاليه
- مجمع فلسطين الطبي–رام الله

مع العلم ان مشرف الدراسة: د. أشرف الميمي.

على ان يتم الالتزام بالمحافظة على اخلاقيات البحث العلمي وسرية المعلومات، وعدم التعرض للمعلومات التعريفية للمشاركين.

على ان يتم تزويد الوزارة بنسخة PDF من نتائج البحث، التعهد بعدم النشر لحين الحصول على موافقة وزارة الصحة.

مع الاحترام،،

د. عبد الله القواسمي
رئيس وحدة التعليم الصحي والبحث العلمي

نسخة: عميد كلية الدراسات العليا المحترم/ الجامعة العربية الامريكية

IAH Research Application Form

Date	11 Dec 2024
Name of investigator	Dua'a H. Abdalgani
Mobile No.	+972595107426
Email	duaa.abdalgany@gmail.com
Expected start date	14 Dec 2024
Expected completion date	25 Jan 2024
Name of Company/University	Arab American University
Attached needed	
Investigator CV	☑Yes ☐No
Study Proposal	☑Yes ☐No
Consent Form	☑Yes ☐No
Data Collection Tools	☑Yes ☐No
Informed Consent (Arabic & English)	☑Yes ☐No
For HR Department	
Receiving Date	
Application completed	☑Yes ☐No
Transfer Date	15/12/2024
Educational Officer Signature	
For Ethical Committee	
Receiving Date	
Ethical Committee Approval	☑Yes ☐No
Ethical Committee Note	Approved
Head of Ethical committee Sig.	29/12/2024
CEO Note	OK
CEO Sig.	29/12/2024

- For Non-Experimental Research only

Approval date: 2024-12-09
Ref: CRC_2024_0437

Subject: Approval to conduct a research project at An-Najah National University Hospital

Dear Mrs. Dua'a Abdalgani,

I am writing this letter to grant you permission to conduct your research project titled "Assessing of Readiness Factors for Lean Six Sigma Implementation in the West Bank Hospitals: A Cross- sectional Study". I hope your study will provide new insights and contribute the advancement of knowledge and evidence. Furthermore, I would like to emphasize the importance of adhering to the ethical guidelines set forth by the hospital throughout the research process.

On behalf of An-Najah National University Hospital, I extend my best wishes and support for your research endeavors.

Sincerely,

Sa'ed H. Zyoud, Ph.D.
Clinical Toxicology
Director of Clinical Research Center

CC:
Chief Medical Officer
Chief Nursing Officer

الإدارة الطبية
ANUH
Medical Mananement

Note: this approval letter is not valid unless signed and stamped by the CRC and the Chief Medical Officer of An-Najah National University Hospital

نموذج اجازة بحثية

التاريخ: 26/ 1 /2025

بعد الأطلاع على طلب الطلبة: دعاء عبد الغني / تخصص ادارة الجودة في المؤسسات الصحية / من الجامعة العربية الامريكية باجراء دراسة / بحث علمي في موضوع:

تقييم عوامل الاستعداد لتنفيذ منهجية ليين ستة سيجما في مستشفيات اضفة الغربية

والاطلاع على الهدف من الدراسة, فانه لا مانع لدى لجنة الأخلاقيات وحقوق المريض من اجراء البحث في مرافق المجمع وفق المنهجية العلمية السليمه المبنية على "الموافقه المبنية على المعرفة " ولاغراض البحث العلمي فقط وبما لا يتعارض مع الحقوق الانسانية والخصوصية والسرية للمريض والمواطن الفلسطيني داخل المجمع.

كما يتوجب على الباحث تزويد ادارة المجمع بنسخة الكترونية عن نتيجة البحث فور الانتهاء منه : Aabumuhsen1@gmail.com .

وعليه نرجو من كافة المدراء ورؤساء الدوائر المعنية تسهيل مهمة الباحث في مرافق المجمع.

اسم وتوقيع الباحث: د. عبد

رئيس لحنة الخلاقيات وحقوق المريض في مجمع فلسطين الطبي

الدكتور مراد بركات

عنوان الرسالة: تقييم عوامل الاستعداد لتبني منهجية لين ستة سيجما في مستشفيات الضفة الغربية: دراسة مقطعية

اسم الطالب الرباعي: دعاء حفظي رشدي عبد الغني

أسماء لجنة الاشراف: د. أشرف الميمي، د. سامي الصدر، د. إباء دعسان

ملخص

تُطبق منهجية اللين ستة سيما بشكل متزايد في المستشفيات بهدف تعزيز الكفاءة، وتقليل الهدر، وتحسين رضا المرضى .ومع ذلك، فإن تطبيق هذا المنهج يتطلب جاهزية تنظيمية، وتُعد الدراسات المتعلقة بعوامل الجاهزية ضمن سياق الرعاية الصحية في الضفة الغربية محدودة. لذلك تهدف هذه الدراسة إلى تقييم العوامل المؤثرة على جاهزية المستشفيات لتطبيق المنهجية في الضفة الغربية عبر المستشفيات الحكومية والخاصة، مع دراسة تصورات الموظفين ومدى وعيهم بالمنهجية.

باستخدام تصميم مقطعي واعتماد عيّنة ملائمة، جُمعت البيانات من 94 موظفاً في المستشفيات يشغلون أدواراً مهنية متنوعة، من خلال استبانة مُنظَّمة، وتم تحليل البيانات باستخدام نمذجة المعادلات الهيكلية الجزئية الصغرى ((PLS-SEM.

شملت العوامل التنظيمية الرئيسة التي تم تقييمها :الالتزام الإداري والقيادة، الثقافة التنظيمية، التدريب والتعليم، الاتصال والتعاون، توفر الموارد والبنية التحتية، وتقييم العمليات الحالية. وقد كشفت النتائج أن كلاً من الالتزام الإداري والقيادة، والثقافة التنظيمية، وتوفر الموارد والبنية التحتية تؤثر بشكل كبير على جاهزية المستشفيات لتطبيقLSS ، في حين أن التدريب والتعليم، والاتصال والتعاون، وتقييم العمليات الحالية لم تُظهر تأثيراً مباشراً ذا دلالة إحصائية على الجاهزية.

وعلى الرغم من أن التدريب والتعليم قد عزّزا الوعي بمنهج اللين ستة سيغما بشكل ملحوظ، إلا أن الدور الوسيط للوعي في العلاقة بين التدريب والتعليم والجاهزية لم يحظَ بالدعم الإحصائي. وعلى نحوٍ مشابه، لم يُظهر اعتماد المستشفى من اللجنة الدولية المشتركة (JCI) تأثيراً تعديلياً على العلاقة بين الثقافة التنظيمية والجاهزية، إلا أن النتائج دلّت على أن المستشفيات الحاصلة على اعتماد (JCI) تمتلك مستويات أعلى من الجاهزية بشكل عام، مما يشير إلى تأثير داعم محتمل للاعتماد.

ورغم محدودية معرفة المشاركين المسبقة وتدريبهم على منهج اللين ستة سيغما، إلا أن تصوراتهم حول فوائده كانت إيجابية بشكل عام .تسلط هذه النتائج الضوء على العوامل التنظيمية

والسياقية الأساسية لتبني LSS بنجاح، كما تقدم إرشادات عملية لقادة القطاع الصحي الساعين إلى تحسين العمليات وجودة الرعاية الصحية في البيئات محدودة الموارد.

كلمات مفتاحية: لين ستة سيغما، جاهزية المستشفى، عوامل الجاهزية التنظيمية، وعي الموظفين، تحسين جودة الرعاية الصحية.