Global Business and Management Research: An International Journal
Vol. 15, No. 3s (2023)

The Mediating Role of Lean Six Sigma and Quality Performance on the Association between Organizational Factors and Competitive Advantage in Health Care Sector

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Abstract
Purpose: This study presents a conceptual framework that brings together top management commitment (TMC) and Training & education that can help the organizations to achieve a competitive advantage (CA) through enhancing the Quality performance (QP) and Lean Six sigma (LSS) in healthcare (HC).
Design/methodology/approach: The models of LSS, QP, and CA measures were reviewed in the conceptual framework construction. A synthesis of the existing literature provides the basis for the conceptual framework development for the LSS measures. The independent variables are TMC and Training. The mediator variables in this framework were QP and LSS. In addition, the CA was presented as the dependent variable.
Findings: The framework provides a systematic way of evaluating the measures of LSS in health care. Accordingly, the newly developed conceptual framework identifies and describes the direct relationships between organizational factors and CA in the HC sector and the indirect relationships through QP and LSS.
Originality/value: This research is valuable for the professionals working in HC, seeking to improve QP and achieve CA in the hospitals. Moreover, this study is beneficial to researchers and academics working in LSS fields through its exploration of the importance of LSS implementation in hospitals. However, owing to the limited studies on the status of LSS implementation in HC, this study is expected to provide theoretical and practical contributions for LSS approach in healthcare.

Keywords: LSS, Quality Performance, Competitive Advantage, Top Management Commitment, Training & Education.

1. Introduction

Quality improvement is a sensitive subject that all industries must control carefully and continuously especially in HC, because it's a unique and sensitive service industry. As such, any problem might cause a medication error that could harm human's life, and therefore risking the quality of life of humans. Hence, reducing medical errors will improve patient safety, provide better medical care, improve the quality of life, and contribute to protecting human lives (Antony et., 2021). Moreover, hospitals have been facing serious challenges due to patient safety and quality problems. Among the problems faced include poor design for HC processes

involving unnecessary duplication of services, in addition to long delay and waiting times for the patients, and rapidly increasing costs owing to the increase in waste and expenditures on HC services (Gonzalez Aleu & Van Aken, 2017). Consequent to these complications, HC organizations are working hard to meet their patients' needs for high quality services. However, if HC providers fail to acknowledge the importance of delivering quality service and patient satisfaction, they might lose their patients, and this is a critical dilemma faced by all HC administrators (Alblooshi et al., 2020; Gonzalez Aleu and Van Aken, 2017). Accordingly, this situation forces HC managers to work under competitive pressure to improve their operations and deliver high-quality HC services with the lowest costs to satisfy and retain their patients (Gonzalez Aleu and Van Aken, 2017; Buttigiet et al., 2016). In line with previous discussions, Antony et al. (2012) found that it is worthwhile to apply LSS, particularly in the HC industry, in order to resolve the issues associated to patient safety and other quality problems to improve QP and patient retention, which will preserve the competition of HC industry in today's highly competitive markets (Ahmed et al., 2018). Eventually, HC organizations are continually seeking opportunities to eliminate waste and enhance QP by adapting LSS initiatives that help the organization in gaining a sustainable CA. However, while there have been some attempts to improve the understanding of such variables in a few studies, these previous studies have limitations whereby LSS has not been fully demonstrated. Hence, there is a need to conduct more studies to expand the existing knowledge on QP, LSS and CA. The key aim of the current study was to create a conceptual framework of the mediation role of LSS & QP between two organizational factors and CA. In contrast to other research on the same topic, the current approach was eying to identify "What" are the determinants of LSS practices in HC sector by accessing and understanding several previous studies covering the dimensions of LSS practices in HC. Finally, the current study attempted to identify the possible advantages from this interaction that could justify "why" LSS should be applied in HC to verify what results can be generated from the implementation LSS in HC. Therefore, to address the above-mentioned questions and reach the research objectives, the current study follows this structure: Section 2 presents the literature review, Section 3 elaborates the conceptual framework, Section 4 describes the methodology, and Section 5 provides a conclusion that summarizes the study.

2. Literature Review

LSS approach helps HC organizations' work balance in the service processes, minimizes variation, reduces waste and all the redundant long cycles, and eliminates waiting times between value-added activities, all of which could enhance QP which contributes in the formation of a sustainable CA for the hospitals (Poksinska et al., 2017; Ahmed, 2019). Furthermore, to implement the quality management system in organizations, managers should make strategic decisions to apply quality management approaches to enhance organizational performance (Lee et al., 2018). In this regard, a lack of commitment from top management will impede the application of quality management tools such as LSS within the organization. Besides, committed managers help in building the organizational awareness toward implementing quality management systems to achieve superior QP (Ahmed et al., 2021). In addition to TMC, intensive workforce education and training were identified also as crucial for successful LSS implementation, as mentioned by Anthony and Banuelas (2002). Hence, hospitals must provide training, while also equipping the employees with the skills and knowledge needed, in order that LSS could be successfully implemented to improve QP (Antony et al., 2021; Sony et al., 2020; Ahmed et al., 2021). Hence, to improve the quality of services in HC industry and further enhance its overall performance, HC organizations should focus on understanding and clarifying the HC problems and patient safety requirements, and constant performance monitoring and findings reporting to sustain and test the change for better performance, with the involvement of HC organization key stakeholders. Consequently, the increased improvement of QP will allow HC organization to meet patient requirements, which in turn will increase the overall performance. On the other hand, according to Cavusgil and Zou (1994), TMC and Training are supported by contingency theory which states that organizations must consider both external and internal environmental factors to thrive (Beleska-Spasova, 2014). Likewise, Ferdousi et al. (2019) approved that RBV and contingency theory effectively understand the concept of CA and organizational factors (Barney, 2001). Therefore, based on previous discussions, this study contributed the theoretical and empirical insights into the literature through its development of a framework comprising a blend of contingency theory and the RBV of hospitals. Specifically, TMC and training were incorporated into the study framework. These potential organizational factors were examined in terms of their effect on CA directly or indirectly through two potential mediators namely QP and LSS. The effectiveness of the mediating effects in HC literature was examined, in both the international arena and the developing countries.

2.1 Determinants of LSS in HC services

1. SS approach

SS can be defined as a statistical methodology relating to elimination of the causes of variations or errors in the product and primary business processes (Desai & Prajapati, 2017). SS is quality strategy for the outcomes of bottom-line to improve process projects (Gowen et al., 2012). It also helps the company in efficiently correcting business processes as opposed to its rivals (Pande et al., 2005). SS methodology includes many strong statistical tools and techniques to identify HC organization's quality improvement process, as can be exemplified, among others, by Failure Mode and Effect Analysis, histogram, KANO Model, check sheet, statistical process control chart (SPC), Pareto chart, and Root Cause-Effect, DMAIC (define, measure, analyse, improve, and control), DFSS (design for SS) (Furterer, 2016). Also, Mutia and Nyambegera (2014) had mentioned in their study that the SS approach is a powerful business strategy to achieve and sustain service and performance excellence. However, based on past works on SS (Zu et al., 2008; Shafer & Moeller, 2012; Ahmad et al., 2018; Hilton & Sohol, 2012; Ahmad

et al., 2019), the present study adopted the three associated practices with SS implementation identified by Zu et al., (2008) as follows:

- **SS role structure**

According to Linderman et al. (2003), SS adapts champions including black belts, masters' black, yellow belts, and green belts as a group of improvement specialists. Furthermore, Gowen and Tallon (2005) added that in these certificates, improvement specialists receive special training to enhance the specialists' knowledge and capabilities in different statistical tools, process design, problem-solving techniques, project management, leadership competencies, and other related managerial completeness. Thus, these certificates will help the organizations to assign tasks and accountabilities in managing and leading the constant efforts of improvement which could result in the establishment of an SS role structure to improve the quality. However, there should be a proper hierarchical coordination technique to improve quality at all organizational levels. Therefore, as mentioned by Sinha and Van de Ven (2005), top management such as senior managers lead the development of the organizational strategic improvement plans, and black belts projects in addition to mentoring green belts in problem-solving. This could facilitate work coordination and control at different organizational levels to make sure that the tactical tasks correspond with the overall business strategy. Furthermore, others have highlighted the importance of hiring a full-time specialist who is a critical characteristic of SS.

- **SS structured improvement procedure**

The literature review reveals that researchers noticed that SS could be implemented effectively and efficiently through two critical methodologies used in service design improvement namely DAMIC and DMADV (Define, Measure, Analyse, Design, Verify) which appeal to different instruments and techniques of the management for their leadership (Cheng, 2008; Siviy et al., 2007). Deming's cycle Plan inspired both methodologies–Do–Check–Act (PDCA) (Cheng, 2008; Linderman et al., 2003). However, what differentiates SS from the Deming cycle is that quality management tools and techniques should be specified in each step of SS (Linderman et al., 2003).

- **SS focus on metrics**

Based on previous studies, the SS metrics have been used to set improvement goals by focusing on quantitative metrics that can be used in continuous improvement. Thus, according to Pyzdek (2003), many quantitative metrics can emphasize SS, like; critical-to-quality metrics, process Sigma measurements, defect measures, and basic quality measurements such as process capability. Therefore, as Linderman et al. (2003) concluded, in SS projects, setting improvement goals can lead to superior improvements, decrease errors, and minimize the variability of the projects' performance, which could increase the awareness of employees toward quality. Moreover, through a systematic review process, SS connects business-level performance, process measures, and project metrics, to improve the organizational outcomes (Barney, 2002).

2. Lean practices

One big challenge in describing the adoption of Lean system is the lack of accord with respect to how to explain and implement Lean, considering that the principles of Lean are describable and comprehensible in varied manners and contexts (D'Andreamatteo A, 2015). Thus, Liker's (2004) principles are comprehensive and cover the critical aspects of Lean implementation. Malmbrandt and Åhlström (2012) accordingly presented an instrument for Lean performance measurement in the European service sector (ESS) firms that share properties with HC on direct connection with patients. Consequently, Kaltenbrunner et al. (2017) developed Malmbrandt

and Åhlström's instrument based on Liker's description of Lean originated in the automobile industry to measure Lean maturity in an HC context.

This study thus employed Kaltenbrunner et al.'s (2017) instrument to measure the extent of Lean HC implementation. Kaltenbrunner et al. (2017) indicated that the domain philosophy essentially concerns decision making based on long-term thinking for the creation of values for the individual patient and society, focusing specifically on the customers, as all organizations should pursue. In this regard, HC also focuses on the customer and on values creation for the patient (McCormack & McCance, 2010).

In the current study, the philosophy domain was represented by three items: employee commitment, management commitment, and time for improvement work. Further, the domain processes aim to enhance quality, efficiency and effectiveness by optimally allocating resources and eliminating all types of wastes. Thus, this could be attained through the mapping processes and flow improvement. Lean tools improve the processes in HC in different ways through the use of various means, for example, the use of 5S practices is essential to organize spaces so work can be performed efficiently, effectively, and safely.

The use of Kaizen methods involves a number of steps: define the problem of the workflows, track the workflows, set the cycle times of the work processes, work out the various improvement alternatives, and select the best option to solve the problems to increase the quality of work processes (Ahmad et al., 2018). Consequently, once the flow becomes optimal, there will be the least possible waste, and the employees know what is expected from them, and when to do what they should be doing. Furthermore, eliminating waste can be defined as the eradication of all steps that will not increase any value to the product or service as opined by the customer and patient. Waiting time, needless movements, product imperfections, and failure to utilize employees' creativity are all considered as waste. To minimize waste in every process, procedure, and task with ongoing daily operation improvements, HC applied lean tools.

Lean tools emphasize patient requirements by eliminating costs, enhancing the efficiency of the delivery of the medical services, and identifying waste areas to eliminate anything that does not add value to patients (Hagan, 2011). Many studies have highlighted the importance of applying lean tools in HC such as process mapping which can help health caregivers to eliminate the non-essential elements in the work process, value stream mapping for value-added activities, and finally, just-in-time approach which is considered as a crucial tool in eliminating waste and reducing waiting time, which will affect the QP in HC organizations. (D'Andreamatteo et al., 2015; Williams, 2017). Specifically, the domain process is represented by seven items namely value stream mapping, pull system, proactive planning, built-in quality, standardized tasks, visualization of improvements, and use of reliable techniques that support employees and processes. Furthermore, the people and partners domain encompasses challenging and respecting people and allowing them to prosper in the organization (Liker, 2014).

In HC, it is important to show respect to people and promote their growth. It is thus important to have people-centered medical care services. Also, all stakeholders such as employees, partners, and suppliers should be respected (McCormack & McCance, 2010). Also, this approach contains the obligation of the organization to assure qualify staff and provide them the fundamentals for the provision of superior-quality patient's care (McCormack & McCance, 2010). Specifically, the people & partners domain is represented by three items: Change agent, Identification of customer values, and showing respect to partners and suppliers. Finally, the domain of problem-solving intents is to achieve proper quality and flow in the organization through identifying the causes of problems. Thus, the employees continuously solve problems and consequently they will take part in evaluations, decisions, and the development of their

organizations. The problem-solving domain is represented by three items: structured problem-solving, making decisions slowly and by consensus, and Employees measuring & following up work. Therefore, Kaltenbrunner et al.'s (2017) instrument is considered the best instrument in the context of HC as the principles included are comprehensive, quite generic, and cover two core aspects namely the operative and a philosophical side of Lean, and stress human resources, which constitute important reasons for selecting Kaltenbrunner et al.'s (2017) LiHcQ in the current study.

2.2 Theoretical Perspective of the Study

Contingency theory explains the manner in which a given organization is able to customize quality practices and, then, present performance variation (Zhang et al., 2012). Likewise, studies that examined the internal determinants of CA tend to be oriented toward the resource-based view (RBV) approach and maintain that a hospital's CA is decided by corporate administration. On the other hand, organizational factors (rewards system and patient focus) are justified by contingency theory, which states that companies should be aware of both external and internal environmental factors in order to develop and prosper (Beleska-Spasova, 2014). Furthermore, Ferdousi et al. (2019) recently confirmed that RBV theory and contingency theory effectively explain the association between CA and organizational factors. Consequently, building upon previous discussions, this study will contribute theoretical and empirical acumens into the available literature by creating an integral model that builds upon contingency theory and the RBV of hospitals. The theoretical framework incudes two organizational factors—reward & recognition and patient focus—to determine their effect on CA directly and indirectly through LSS. This analysis focuses on the importance of studying these factors' mediating effects, during the attempts to prosper and compete in a competitive market, within the literature on HC.

3. Theoretical Framework and Hypothesis Development

Considering the past findings and the literature gap, the present study presented a theoretical framework to be empirically tested in the context of HC, and this would significantly add to the HC literature. Resource-based theory (RBV) and Contingency theory were the two theories underpinning the framework. As posited by RBV, the performance of firm is affected by the ideal acquisition and proper use of the rare set of resources that the firm owns (Barney, 2001; Peteraf, 1993). RBV additionally posits that the unique resources that the firm owns will aid the organization in their practices of behaviour to improve their performance quality. Medical staff that implements business strategies in accordance with their valued resources will provide the foundation for a sustainable CA (Runyan et al., 2007). Figure 1 shows a model that focuses on two independent variables (TMC and training), two mediator variables (LSS and QP), while the dependent variable is presented as a CA.

Taking into consideration of the findings of past studies (i.e., Zu et al., 2008; Kaltenbrunner et al., 2017; Shafer & Moeller, 2012; D'Andreamatteo et al., 2015; Ferdousi et al., 2019; Malmbrandt & Åhlström, 2012), a conceptual framework and several hypotheses were proposed in this study. As displayed in the following Figure 1, the study's research conceptual framework comprises 13 hypotheses which will be detailed in the following sections.

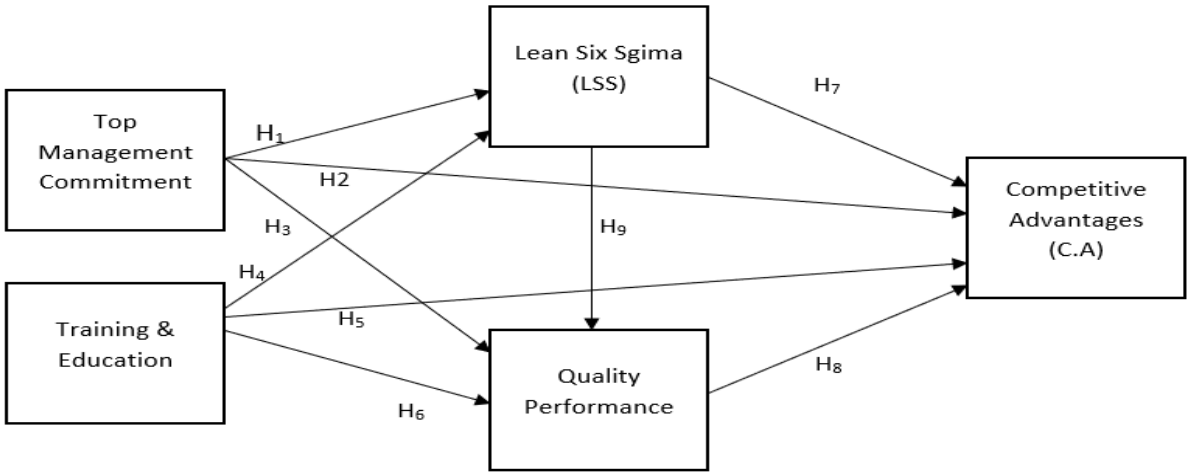

Figure 1: Theoretical Framework

Based on the framework, the present study developed nine hypotheses to measure nine direct relationships. The first three hypotheses measure the direct relationship between TMC and LSS (H1), CA (H2), and QP (H3). H4 measures the direct relationship between training & education and LSS, H5 measures the direct relationship between training & education and CA, H6 measures the direct relationship between training & education and QP. The seventh hypothesis explains the direct relationship between LSS and CA, and the eighth hypothesis explains the relationship between QP and CA. Finally, the ninth hypothesis explains the direct relationship between LSS and QP. Moreover, the present study developed four indirect hypotheses to measure the in-direct relationships between variables. The first two hypotheses measure the indirect relationship between TMC (H10), training and education (H11), and CA through LSS. However, the twelfth and thirteenth hypotheses measure the indirect relationship between TMC (H12) and training and education (H13), and CA through QP. The following subsections describe the associations between the variables utilized by this study.

3.1 The Relationships among TMC with LSS, QP and CA

• Top management Commitment and LSS

Any successful quality initiatives require proper management commitment and support, which is necessary to guarantee the success of the efforts made. TMC plays a significant role in effectively applying the LSS approach, as evidenced by executives including Lawrence Bossidy of AlliedSignal, JackWelch of GE, and Bob Galvin of Motorola; all of these executives had led the successful implementation of LSS in their firm (Guesalaga, 2014). Going back to the early 2000s, Coronado and Antony (2002) mentioned that TMC is crucial for LSS's successful implementation. Desai et al. (2012) relevantly indicated that the level of management commitment and support is among the most important factors for LSS success. Moreover, Ahmad et al. (2018) described in his study how TM clearly plays an effective role in the adoption in the initial stages of LSS programs as they are responsible to set the organizational targets, and control the needed resources. TM also can consolidate the programs as the first priority for middle management. Similarly, Chakravorty (2010) concluded that executives should think beyond offering support to staff and thus they need to "directly participate" with the LSS process. Moreover, Wang and Chen (2010) concluded that the proper implementation of LSS require strong commitment from managers from all levels in providing knowledge, authority, resources as well as training, to resolve the problem. Moreover, Lee et al. (2014) added that in LSS adoption, top management is the party that makes the necessitated

strategic decisions. Furthermore, Black and Revere (2014) concluded that TMC helps organizations to make effective strategic decisions required for LSS adaptions and then communicate the new changes and provide advice to employees to encourage them to engage in applying the LSS approach as it has a positive effect on QP. Ahmed et al. (2018) added that, top managers should use their power in the LSS black belt and green belt systems integration into the human infrastructure of the organization. Eventually, almost all reviewed literatures in LSS implementations in HC organizations showed a significant relationship between TMC and LSS successful implementation (Yadav et al., 2021; Ahmed et al., 2018). Therefore, this study proposed the following hypothesis:

H1: TMC significantly influences LSS.

• TMC and CA

TMC emphasizes how executives take part in and provide support to the organization's strategy and operations. Also, they set and communicate the organization's vision, mission and targets, aside from participating in the organization's management, allocating the required resources and time to the company's management, authorizing and encouraging staff, and observing the operations of the organization to achieve the goals (Amoako-Gyampah et al., 2018). TMC has a crucial role in the policy for company evaluation, and it also determines the company's strategy, targets, policies, long term and short-term plans, in addition to the company's objectives (Tarigan et al., 2020). Tarigan et al. (2021) further mentioned that management is responsible in the determination of the allocation of the required resources within the company in line with the procedure and policies in running the business and the competitors' statements. Advocators of RBV indicated that effective, strong, committed, supportive leadership are tacit and hard to be imitated, and thus, this competence is a potential CA source (Janson & McQueen, 2007).

Sauer and Seuring (2017) concluded that executives must actively establish supply chain partnership for continuous collaboration with the supplier in developing the product and building a CA. Later, Tarigan (2018) concluded that leadership is critical in evaluating the success of a company in encountering the competitors. It is important that leader could facilitate the innovation of the products or processes. Additionally, research conducted by Ferri and Pedrini (2018) stated that executives can enhance the organizational performance and this has significant effect on the company's CA. Recently, Tarigan et al. (2019) TMC can directly affect the CA as a priority for the top management to make a series of decisions and policies in achieving a CA for the company. Furthermore, top management is strongly responsible to work hard to accomplish the organizational goals by enhancing the employee competences and providing the required resources to achieve customer satisfaction. Eventually, it has been concluded that the ability of HC organizations to create a CA enables the hospitals to provide a valuable benefit to the patients, and in the end, the company will enjoy the growth of patient's retention, loyalty, and quality service. Hence, it is believed that TMC influences CA, and so, the second hypothesis was:

H2: TMC significantly influences CA

• TMC and Quality performance

Many scholars have discussed different definitions for TMC in terms of quality, for example, Zhang et al. (2000) defined TMC as the extent of participation of leaders in different quality-related activities. The authors specifically defined the concept as the level to which top management strongly and aggressively supports quality initiatives, delivers the resources required to support the use of the quality tools deployment effort, share their support for quality, and empower the employees to engage in quality practices. TMC affects quality improvement activities, leading to the enhancement of QP by facilitating and supporting each step of quality

processes (Negri, 2003). Moreover, committed managers enhance quality through properly allocating the resources of organizations, which consequently enhances quality. In the HC context, Kathan (2008) mentioned that TMC helps HC organizations in creating organizational awareness and in increasing the commitment of employees toward applying the LSS methodology to reach the ultimate quality targets. Moreover, Harmancioglu et al. (2010) mentioned that TMC gives clear and significant direction and resources to HC organization to enhance QP and provides an integrative working environment that initiates HC organizations to apply the quality system to increase the patients' satisfaction. Furthermore, Zeng et al. (2015) mentioned that senior executives should provide a strategic decision to ease the implementation of the LSS methodology in the early stages to improve the QP. However, according to Ahmed et al. (2019), to create an effective relationship between TMC and QP in HC organizations, managers should apply informal strategies like supportive management, making continuous staff reviews, providing employee feedback programmes, considering employee suggestions, in addition to managing the employees' relations, empowerment and engagement. Thereby, within the context of the present study, TMC was expected to affect QP positively. Therefore, the third hypothesis was:

H3: TMC significantly influences QP.

3.2 The Relationships among Training and Education with LSS, QP and CA

• Training & Education and LSS.

Massive training program in the workplace was identified as one of an essential requirement for LSS successful implementation, as mentioned by Anthony and Banuelas (2002). Strengthening LSS education and training in the firms appeared to be a critical success factor among local Taiwanese enterprises (Cheng, 2009). In contrast, to have an effective LSS program in health organizations, an appropriate LSS training program is important to provide the required skills, tools, knowledge, and methodologies towards a systematic approach to problem-solving. According to Johnson (2003), training is significant to help medical staff in understanding LSS's fundamentals, tools, and techniques. Also, Antony (2002) concluded that one of the notable features of LSS is that it elaborates training and certification process, resulting in, for example, Black belt or green belt (Antoney et al., 2003; Ladhar, 2007). Hence, training is an essential requirement for the strong deployment of LSS. Finally, many researchers have devoted considerable attention to testing the training and education effect on LSS implementation, and concluded training as the most significant factor for the successful implementation of LSS (Yuik et al., 2020). Thus, upon previous studies, the present study hypothesised the following:

H4: Training and Education significantly influence LSS.

• Training and Education and CA

Most HR scholars have mentioned that HR practices can help organizations to achieve CA since proper HR practices are problematic for competitors to be imitated. Furthermore, Shenawy et al. (2007) mentioned a significant link between teamwork, training, and CA. However, many previous studies supported this view, for example, Phan et al. (2011) emphasized that strong managers should focus on involving, empowering developing, and motivating employees, to achieve employees who are skillful, committed, and quality-minded, which leads to improved employee performance, increasing employees' satisfaction, productivity and revenue gains, which consequently generates CA. Similarly, Sirmon et al. (2011) mentioned strong employee management a tacit management skill that eases the process of organizational learning of employee behavior to achieve CA. In the same vein, Powell (1995) and Nguyen et al. (2010) concluded that training and development facilitate employees

to increase knowledge, skills, and attitudes, which will help them in performing their assigned tasks quickly and without difficulties. This will affect employee retention and job satisfaction that will lead to the achievement of a CA consequently. Taamneh et al. (2018) concluded that organizations could gain a CA by using best HR practices in different perspectives, such as training & education. Eventually, training helps organizations to create a distinctive advantage which leads organizations to generate a special value for patients particularly by way of correct use of its resources and competencies (Fitzroy & Hulbert, 2005). Thus, based on RBV, this study expanded the organizational knowledge on limited resources allocation amongst Training & education to gain a sustainable CA. Therefore, based on the available literature, this study hypothesised the following:
H5: Training and education significantly influence CA.

• Training and education and QP

Training is one of the most flexible and adaptive means for improving performance and increasing safety in HC systems. Furthermore, Talib et al. (2013) added that training is one of the vehicles for addressing new knowledge requirements and for enhancing QP. Going back to 2000s, Zhang et al. (2000) mentioned that training is critical to any quality improvement approach that eases staffs' specific capability or knowledge and directs workforce to do the required tasks or a specific job. Furthermore, Sharma and Gadenne (2008) mentioned that the organizations should provide specific training related to quality-related methods and procedures to increase the employees' awareness of quality and improve QP by minimizing defects and improving quality (Kaynak, 2003).
In the same vein, many studies have explored the link between training and quality performance. Ho et al. (2001) and Hasan and Kerr (2003) for example, had reported that training significantly affected service quality, in which training leads to achieving higher productivity and QP. Hence, from previous discussions and findings, this study believed that training could improve employee skills, knowledge, and attitudes and enhance QP accordingly. On the contrary, Ferdousi et al. (2019) mentioned that the shortfalls of the primary health-care system mainly include improper training and lack of educational opportunities for the staff. Accordingly, training will develop the knowledge, capabilities, attitudes, and all types of skills while also increasing the employees' awareness of quality problems and issues. With such outcomes, QP level is likely to be increased. Therefore, within the scope of this research, the following hypothesis was developed:
H6: Training and Education significantly influence QP.

3.3 The association between LSS and QP

LSS focuses on collaborative efforts of people, resources, and tools to enhance HC performance through eliminating the waste (Lean) systematically and reducing the variation in the processes (six sigma), which may result in defects or errors (Asefeso, 2014; Laureani & Antony, 2017). Besides, eliminating waste and errors helps HC organizations to enhance services of QP such as quality nursing care, patient safety, patient retention, patient satisfaction, patient loyalty, length of stay, readmission rate, in addition to the waiting time in medical institution. Also, to meet patient expectations, HC organizations are applying LSS techniques to enhance the value-added activities and reduce the non-value-added ones like waste, and all the needless services, all of which affect the improvements of QP (Abdallah, 2014; Ahmed et al., 2018). However, the aforementioned factors assure the performance level of HC service quality towards patient safety (Chiarini & Bracci, 2013). Hence, the LSS approach is implemented in HC organizations for the purpose of improving the quality of services furnished to the patients to assure their satisfaction, retention, and safety, by reducing medication errors

and eliminating all types of wastes (Khanchanapong et al., 2014). Consequently, this study came to a deduction of the significant impact of LSS methodology on HC's QP. Thus, the current study hypothesized the following:
H9: LSS approach has a positive influence on QP.

3.4 The Relationship between LSS and CA

In the current competitive and dynamic business environment, HC institutions are working under extensive pressure to provide high standards of quality, improve patient satisfaction, in addition to generating positive bottom-line outcomes. Thus, there is an essential need for deploying continuous improvement methodologies such as LSS in hospitals. LSS implementation may provide caregivers the ability to generate CAs by meeting patients' requirements with enhanced effectiveness and efficiency (Sony, 2020; Madhani, 2020). The first functionality of LSS in services organizations is to enhance operational efficiency and effectiveness through collaborative efforts of employees and resources to enhance the QP by systematically eliminating waste (lean) and variation in a process which may result in defects or errors (six sigma) leading to the competitive positioning of HC organization (Laureani & Antony, 2017). Furthermore, by applying LSS in HC organizations, the activities will be coordinated across all divisions to produce ultimate value to the patients and achieve a sustainable CA. Therefore, to gain a sustainable CA that is difficult to be imitated, there is a need for a LSS framework to coordinate and synchronize these activities in a strategic manner (Hitt & Carnes et al., 2016), making it difficult for rivals to imitate (Peteraf, 1993). Hence, an effective implementation of LSS approach should integrate the strategies of organizations with the organizational resources, infrastructure and capabilities which will ultimately result in the achievement of a sustainable CA organization. Finally, various scholars have paid considerable attention to testing the level of LSS implementation on CA and concluded that LSS is a business strategy that improves QP, enhances service quality, and improves patient satisfaction through eliminating waste and minimizing the variation of operations resources and capabilities. All of these help organizations in acquiring the best strategic resources then in optimally using these resources to create the CA (Karunakaran, 2016; Hill et al., 2018; Sony, 2019; Madhani, 2020). Hence, within the study scope, it can be assumed that the LSS approach has a significant effect on HC CA. Thus, the seventh hypothesis was:
H7: LSS has a positive influence on CA.

3.5 The association among QP and CA

A QP is an integrating set of policies and practices that lead to long-term business success and competitive advantages through proper participation of all employees (Storey & Sisson, 1993). Various researcesh have highlighted the association between QP and CA such as Fletcher (1993) and Dahlgaard et al. (2011) that mentioned that QP is a system that constructs an organization's vision to facilitate each employee and recognize their contribution to improve QP to satisfy the needs and requirements of customers. Furthermore, there are many approaches to QP validated in previous studies including cost, quality, delivery, and flexibility (Shah & Ward, 2007; Zu et al., 2008). Agus and Hassan (2011) suggested that the HC sector emphasizes top quality services to create and sustain a competitive position, with proper improvements in service quality, so that hospitals could handle their rivals properly, to achieve sustainability CA (Antony et al., 2002). Eventually, better QP reduces defects and cycle time, while improving patient safety, operational activities and CA accordingly (Abdullah et al., 2008; Zakuan et al., 2012; Zehir et al., 2012). Thus, the current study hypothesized the following:
H8: QP has a positive influence on CA.

3.6 The Role of LSS and QP as Mediators to the Relationships between top management and training with CA

Previous studies have investigated the direct relation between TMC and training on CA. Hence this study added to the literature in this area by investigating the effect of two mediators in the relationship involving LSS and quality performance. The test of the mediation effect amidst LSS, QP, and CA was initiated by Hamilton and Chervany (1981) and approved recently by Ferdousi et al.'s (2019) study, and they concluded that the association between organizational factors and CA is indirect through improvements in the administrative processes. Thus, a proper quality practice is important to make the operations of the organization more efficient and effective. In this regard, LSS is an effective operational excellence methodology for HC as it improves quality performance, productivity, profitability, growth, and patient safety, while reducing cost and providing timely service to patients, within the budgetary constraints, all of which, lead to the achievement of sustainable CA (Bhat et al., 2020; Talib et al., 2013; Antony et al., 2018; Ahmed et al., 2018; Gijo et al., 2018).

In contrast, McDermottet al. (2021) mentioned that the limited usage of structured quality improvement tools and the lack of clear strategies have prohibited HC organizations from utilizing the advantages of opportunities and thus created more challenges to the prevailing situation. One of these challenges is in achieving CA as HC organizations nowadays are eyeing to gain a sustainable CA (Bahat et al., 2022). HC leaders and quality practitioners have hence ratified that upholding the HC system and constantly enhancing the current quality activities give the optimal solution to handle current opportunities and widespread challenges such as gaining a sustainable CA (Hundal et al., 2021; Salentijn et al., 2021; Tortorella et al., 2022; Ferdousi et al., (2019). Moreover, Bhat et al. (2022) mentioned that there are two fundamental strategies required for effective implementation of LSS in HC organizations toward CA achieving, namely, top management support and commitment & training. Hence, to attain sustainable CA in HC organizations, top managers should continuously and successfully apply new operational excellence methodologies, specifically LSS.

Successful LSS programme requires committed and supported top management that actively provides and smoothens the way for optimal and timely outcomes by eradicating obstacles, providing financial and non-financial support, and allotting the needed human resources, project follow-up and rewards/recognition for victorious teams (Desai et al., 2012). Besides, the successfully implementation of LSS approach requires appropriate managing of resource costs such as training, supporting technologies, teamwork, dashboards, etc. (Yadav et al., 2021). In this regard, it is important that top managers visualize the projects needs and give a robust infrastructure to create confidence and encourage the teams of practitioners working in LSS (Sreedharan et al., 2018). In order to facilitate success, managers should have traits such as: high-level awareness, empowerment, involvement, comprehension, commitment, support, desire, passion, and enthusiasm towards LSS project implementation. On the contrary, lack of awareness, sensibility and inundation may cause LSS projects failures (Bhat et al., 2022; Antony et al., 2018, 2019; Sreedharan et al., 2018). Bhat et al. (2022) additionally mentioned that to attain a competitive advantage, top managers and practitioners in HC organizations should apply LSS strategies properly without any mistakes, within the given budget and time, and with the best usage of existing resources.

Furthermore, besides top management commitment, training is also required for successfully implementing LSS methodology. Thus, the HR department should promote LSS training to build employee credentials with LSS requirements like Black Belt, Master Black, Green Belt and Belt certifications, create a comprehensive training in the LSS infrastructure to reach so called learning organization (Sony et al., 2020; Antony et al., 2018) and improve the required skills and knowledge to enhance interventions and help staff to execute more projects within a

structured approach and also facilitate them in mastering the tools and techniques of LSS. Based on previous discussions, the effective role of top management and strong training programs will help HC organization to achieve the CA through supporting the application of LSS. Top management and training are two of the most crucial factors leading to the success of LSS application and subsequently leading to enhanced CA. Moreover, top management and training are organizational factors that facilitate the organization in improving its quality (Fotopoulos & Psomas, 2013), for the achievement of a sustainable CA. Thereby, the current study extended the quality management literature through the examination of the mediating role of LSS and QP in the relationship between two organizational factors (i.e., top management support, and training and education), and CA. Likewise, these arguments are in line with the theoretical perspective of contingency theory and RBV which advocate that CA requires a fit between LSS application and QP, and organizational factors. Thus, this study expected the mediation of LSS and QP in the association between TMC and training & development and competitive advantage, as expressed as follows:

H10: LSS mediates the relationship between TMC and CA.

H11: LSS mediates the relationship between Training and education and competitive advantage.

H12: QP mediates the relationship between TMC and CA.

H13: QP mediates the relationship between Training and education and CA.

4. Methodology

The current research adopted a qualitative research approach to highlight the effectiveness of the quality dimensions, in general, from the literature, focusing on TMC, T&D, LSS, and CA. This paper further extended the implementation of LSS into the HC setting, with an understanding that strong management commitment and proper education can affect the implementation of LSS in HC and, accordingly, in achieving CA. The published literature on LSS was used as a source for devising a conceptual framework for LSS implementation in HC. Then, a detailed description of CA in HC was provided to establish its main contributing factors. Finally, a conceptual model was developed to illustrate the relationships in the collected information. The current study developed a model which focuses on two independent variables (top management commitment and education), with LSS and QP as mediators, and CA, which was included as an independent variable in the HC sector, to address the research objectives.

5. Conclusion

Our results will provide a gateway to the study of the relationship between specific organizational factors, namely, LSS, QP and CA in the HC industry. However, in order to proceed with the practical research, additional knowledge should be compiled by exploring a wider range of literature. Ultimately, this conceptual paper aimed to contribute to the available literature as a reference for researchers, as well as to significantly impact caregivers in hospitals upon full completion of the research. As there is no unified structure in the literature on applying LSS in the HC sector, this paper aimed to add novelty for both academicians and HC practitioners. In addition, it has been suggested that during the application of LSS, those in the HC sector should focus on the healthcare-service processes or systems and administrative processes of hospitals. Empowering and involving patients in LSS implementation was the highlight of the proposed framework. Finally, this paper suggested that the integration of HC strategies and the LSS strategy can be an important and effective success factor in achieving sustainable CA

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