

The effect of process quality improvement and lean practices on competitive performance in the UAE healthcare industry

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ABSTRACT

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The purpose of this paper is to empirically examine a theoretical model which identifies the effect of process quality improvement and lean practices on competitive performance in the healthcare industry in the United Arab Emirates (UAE). The study uses a quantitative research technique with convenient cluster sampling through applying a descriptive, causal and analytical research design. A valid sample size of 270 respondents is used for analysis by linear regression and hypothesis testing using SPSS. The results indicate a direct significant relationship between process quality improvement and a direct significant relationship between lean practices and competitive performance. Given the substantial resources spent and efforts to improve healthcare quality, the absence of studies demonstrating the impact of quality-related operations and activities would require future research. Hospitals in one city in UAE have access that limits the research results. It is recommended that future research assess more variables dependency on the healthcare sector that can affect increase competitiveness. The research provides some managerial implications that could help hospital managerial members improve their healthcare delivery system's leanness and quality improvement to get competitiveness. Quality improvement and lean practices help increase competitive performance and can assist the healthcare sector in providing better service using these practices that have never been considered in research.

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1. Introduction

The healthcare industry has a very strong impact on any country's economic growth because this industry demonstrates the government's development and seriousness towards the necessities of its people. However, several healthcare leaders are searching for strategies to achieve significant breakthrough improvements in their organisation's performance due to the mounting pressure on healthcare organisations. The healthcare sector's cost reduction and quality management need improvement. Many developing countries are also looking for healthcare advancement because they have realised the importance of infrastructure development, hospital management, and healthcare facilities for their people. Technology adoption and techniques in the healthcare sector have advanced and showed many advancements in treating various diseases.

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Process quality improvement is the process organisations use to improve the quality of their operations. For example, the manual system has become obsolete due to the arrival of the computerised system. It has changed the way of performing jobs. Through the manual system, there was a delay because humans can work under limited capacity. Machines are more capable and efficient because of the speed and error reduction. Thus, the overall quality of the process has been improved.

Lean practices have changed the concept of job performance. The lean practices aim to reduce waste and create value for the end users. It is only possible when there is a proper system of waste management. This system can only be implemented when organisations perceive value creation. Lean philosophy is instrumental in cost reduction strategy and makes the organisations successful in functioning because of cost reduction and better utilisation of resources. Still, researchers are going through to improve the conditions more effectively. In this regard, the importance of lean philosophy cannot be ignored, which helped this sector attain competitive performance effectively.

The importance of variables in attaining organisational goals, especially in the competitive market, is to effectively achieve organisational goals by maintaining quality standards. Ultimately the organisations aim to reduce costs and create value. Waste elimination means that all the resources are adequately allocated and efficiently utilised to attain desired goals.

2. Theoretical framework

2.1 Process Quality Improvement

Process Quality improvement is a systematic approach to evaluating the presentation of frameworks and procedures and then determining necessary improvements in both practical and operational areas. Successful projects require the usual collection and analysis of information (Newall & Dale, 1991). A quality improvement plan depicts a continuing or persistent process by which the partners in an association can monitor and evaluate actions and outcomes. The process of improving quality is data-driven and sees quantitative methods as the primary dependable means of influencing the subjective elements (Kumaresh & Baskaran, 2010). Process quality improvement is defined as a procedure used by firms to raise the standard of their processes and give their customers more value. The goal of quality improvement is to increase efficiency and meet customer needs. The primary driver of quality improvement in human services is to enhance outcomes (Savolainen, 1999).

2.2 Lean Practices

The lean process creates a more profitable business by eliminating wasteful activities and raising standards. Lean management's fundamental tenets are maximisation of value and waste minimisation (Nawanir et al., 2013). To fully benefit from this approach, the healthcare industry should be aware of Lean's five performance metrics that cover the human development, quality, service, cost, and growth elements of lean practices (Bharsakade et al., 2021).

2.3 Competitive Performance

Competitive performance is a method of reaching performance objectives uniquely based on achieving high-quality measurements (Mahfod et al., 2017). When there is a process of quality improvement, lean practices are competitive performance conceivable since these techniques enable the firms to compete uniquely. Competitive performance can be assessed through flexibility, cost reduction, quality management, and customer satisfaction (Gunasekaran et al., 2019).

2.5 Industry Description

The UAE boasts a robust healthcare infrastructure as one of the Middle East's most economically advanced and diverse marketplaces. The government of the UAE has made building a top-notch healthcare infrastructure a primary priority, and as a result, the industry has developed and grown tremendously over the past few years. Public spending makes up more than two-thirds of total healthcare spending, so the government's commitment to the healthcare industry is one of the major economic drivers in the UAE. A total of \$15.8 billion (AED 58.3 billion) was allocated for public spending in the federal budget for 2021, a decrease of 4.9 per cent from the budget for 2020. Following the COVID-19 outbreak in January 2020, the UAE government moved swiftly to implement preventative health measures. In terms of its COVID-19 reaction, the UAE was recognised as one of the top countries globally and the highest in the Arab world, thanks to its tenacious leadership efforts. Therefore, it is crucial to take an eye on the healthcare sector of UAE and its developmental processes that can improve its competitive performance in the future.

3. Literature review

3.1 Relationship and impact of Process Quality Improvement on Competitive Performance

The ways businesses have assigned responsibilities for quality assurance, quality control, and quality improvement typically have historical roots (Malifete et al., 2018). Except for one organisation, it does not appear that any effort has been made to re-evaluate these obligations in order to make sure that they are compatible with continuous quality improvement; instead,

businesses have essentially tried to adapt current practices to the process in order to retain the competitiveness (Newall & Dale, 1991). The main focus of this research is quality improvement and maintaining competitive performance, with proponents arguing that it will improve operating and financial performance while lowering costs (Adam, 1994). Additionally, this research found enough evidence that quality improvement leads to competitive performance, supporting the first hypothesis of this research.

H₁: *Process Quality Improvement has a significant impact on Competitive Performance.*

3.2 Relationship and Impact of Lean Practices on Competitive Performance

Most organisations adopted lean to improve organisational performance and raise it to the level of international norms in all areas. Lean methods are based on lean thinking to continually create customer value, avoid non-value-added activities, and enhance customer value (Arumugam et al., 2020). Additionally, healthcare management frequently assumes the position of managers, taking charge and exercising lean practices to reduce waste and increase cost-effective services (Arumugam et al., 2020). Healthcare institutions can better comprehend the value of lean knowledge and spread it throughout the organisation when they can manage quality and resources to get competitive performance because these attributes help attain improved organisational performance. The highlighted literature supports this research's second hypothesis that process quality improvement and lean practices significantly impact competitive performance.

H₂: *Lean practices have a significant impact on competitive performance.*

3.3 Relationship and Impact of Process Quality Improvement and Lean Practices on Competitive Performance

Efficient process quality management has been postulated to directly affect quality performance (Molina-Azorin et al., 2015). Many operations management academics examined how policies, strategies, and methods related to quality management and process improvement are used in the healthcare industry to maintain a competitive edge (Adam, 1994). Furthermore, leanness has been described in the context of healthcare as enhancing the overall efficiency of the healthcare system in terms of spending and response time. Healthcare systems need to perform better in terms of prices, how well they use their resources, the standard of care they provide, the effectiveness of their diagnostic procedures, how quickly they can treat more patients, and how they set up their facilities (Bharsakade et al., 2021). The highlighted literature supports the current hypothesis with a significance level that proves the quality improvement process can enhance healthcare services by maintaining the service quality to achieve competitive performance.

H₃: *Process Quality improvement and Lean Practices significantly impact competitive performance.*

3.5 Problem Statement and Research Gap

The COVID-19 outbreak has highlighted the problems in how the world manages healthcare. The uncontrollable and unchecked epidemic quickly spread worldwide, affecting many industries worldwide. Despite taking various steps, the governments of several nations were unable to stop or restrict the spread of COVID-19 infection. Therefore, healthcare management must manage services and performance to become a better healthcare provider. The UAE healthcare industry is targeted in this research to investigate the process quality improvements and lean practices impact on competitive performance. These research results may provide additional knowledge for healthcare providers to enable them to become competitive. Fig. 1. demonstrates the proposed study of this paper.

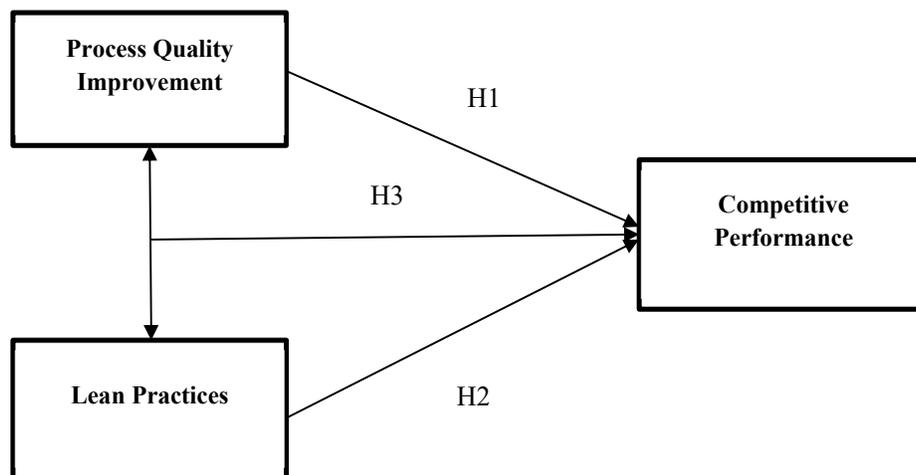


Fig. 1. The proposed study of this paper

3.6 Research Methodology and Design

The research aims to gather information from the Healthcare industry in the United Arab Emirates to evaluate the empirical analysis of process quality improvement and lean practices impact on competitive performance. The quantitative technique employed to evaluate the research variables is a survey questionnaire used in a descriptive, explanatory, causal, and analytical research design to evaluate the variables. A convenient cluster sampling technique was used. SPSS and ANOVA were used to examine the regression and hypothesis testing.

3.7 Population, Sample & Unit of Analysis

The targeted population is 23 hospitals based in Fujairah, UAE, used as a research sample. An online questionnaire was sent via emails to 850 employees. The correspondents are (the business development manager, quality manager, project health manager, and quality and patient safety manager) of the hospital's management department—a valid number of 270 responses received and utilised for analysis. A 33 items questionnaire was developed to assess the variables of the research. To measure the “process quality improvement”, 11 items were used. To measure “lean practices”, 10 items were used, and to measure “competitive performance”, 9 items were used with Five point-Likert scales (from 1=strongly disagree to 5=strongly agree). The questionnaire is inclusive of demographic data such as gender and designations.

4. Data analysis

4.1 Demographic analysis

Fig. 2 demonstrates the summary of the personal characteristics of the participants.

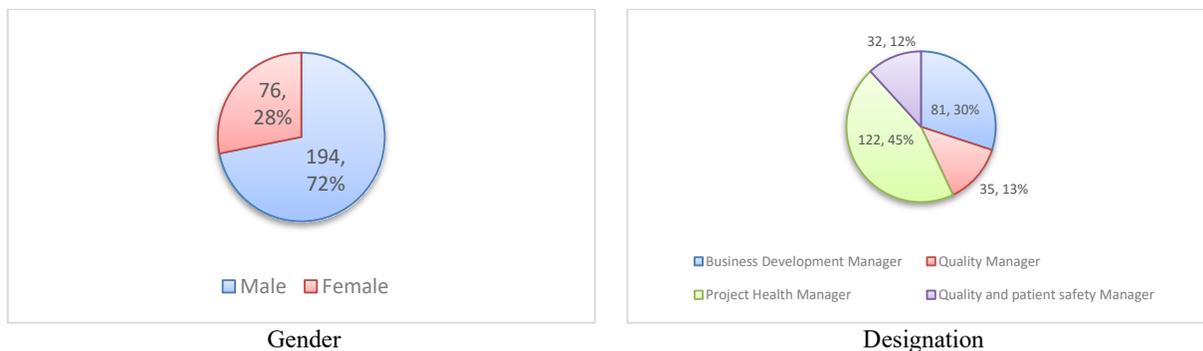


Fig. 2. Personal characteristics of the participants (N=270, Male=194 (71.9%), Female=76 (28.1%))

4.2 Reliability analysis, Descriptive and Correlation

To assess the model's reliability, the data was tested with the outcome of Cronbach's Alpha, which indicated a reliability value as PQI=.86, LP=.86, and CP=.82. The results show enough reliability to analyse further. Descriptive analysis indicates the mean value and standard deviation for PQI (M=3.45, SD=.79%), LP (M=3.45, SD=.65%) and CP (M=3.04, SD=.54%). The correlation coefficient findings show a significant positive relationship of PQI with CP $r=.765$, $P<0.05$, the relationship of LP with CP also indicate a high correlation with a significant positive relationship at level $r=.740$, $P<0.05$ and the results shows a significant positive relationship for PQI with LP $r=.850$, $P<0.05$, depicting a strong relationship between each variable. Table 1 is provided for the data summary.

Table 1
Validity, Descriptive & Correlation Coefficients

Variables	Cronbach's Alpha	Mean	Std Deviation	PQI	LP	CP
Process Quality Improvement	.86	3.45	.79	1		
Lean Practices	.86	3.45	.65	.850(**)	1	
Competitive Performance	.82	3.04	.54	.765(**)	.740(**)	1

PQI=Process Quality Improvement, LP=Lean Practices, CP=Competitive Performance
Level of significance at ** $P<0.05$, * $P<0.001$

4.3 Linear Regression

The findings indicate the significant positive impact of process quality improvement on competitive performance ($\beta=.76$, $SE=3.51$); the results show a significant impact of lean practices on competitive performance at value ($\beta=.74$, $SE=3.67$), whereas the effect of both variables process quality improvement and lean practices have also indicated a significant relationship with competitive performance ($\beta=.78$, $SE=.61$).

Table 2
Linear Regression Analysis

Relationship	β	R ²	Standard Error	p-value
PQI→CP	.765	.586	3.51	.000
LP→CP	.740	.547	3.67	.000
(PQI*LP)→CP	.784	.615	3.39	.000

PQI=Process Quality Improvement, LP=Lean Practices, CP=Competitive Performance
Level of significance at *P<0.001, **P<0.05

4.4 Hypothesis Testing

Table 3
Hypothesis Testing

Hypothesis	Regression Weights	β	R ²	t-value	p-value	Hypothesis
H ₁	PQI→CP	.765	.586	8.69	.000	Supported
H ₂	LP→CP	.740	.547	4.48	.000	Supported
H ₃	(PQI*LP)→CP	.784	.615	6.81	.000	Supported

*Level of Significance ($\alpha \leq 0.05$)

**Critical t-value (df/p) = 1.64

5. Discussion

H₁: The findings supporting this research hypothesis indicate a significant relationship between process quality improvement and competitive performance ($\beta=.765$, $t=8.69$). The critical value shows a positive impact that supports the first hypothesis. The literature found that quality improvement is broad and challenging to break down into specific elements, such as incorporating people and identifying and resolving improvement initiatives that can increase competitive performance (Boyer et al., 2012).

H₂: The research findings support the second hypothesis that lean practices significantly impact competitive performance ($\beta=.74$, $t=4.48$), so the H₂ is accepted. Regarding the past studies, the people in the healthcare industry are more concerned about healthcare quality. Some of the sub-criteria, such as laboratory tests and the unavailability of emergency drugs, are crucial in determining leanness, and this requires lean practices to provide improved facilities in the healthcare sector (Bharsakade et al., 2021; Carvalho et al., 2011).

H₃: The third hypothesis's relationship has revealed a significant impact; both variables process quality improvement, and lean practices significantly impact competitive performance ($\beta=.784$, $t=6.81$, $P<0.05$). Several researchers also highlight the significance of this relationship; competitiveness can be enhanced by getting rid of systemic lean wastes. To quickly and noticeably improve performance, it is essential to focus on the improvement opportunities and increase the leanness of the healthcare systems (Bharsakade et al., 2021; Boyer et al., 2012). Therefore, a structured criterion of lean practices and quality improvement with participation from all stakeholders is required to improve various development opportunities.

6. Conclusion

The healthcare industry has experienced unprecedented expansion in the last couple of decades, with rising healthcare expenditure. The pandemic has shown that rapid healthcare demand changes can overwhelm healthcare institutions worldwide. To attain operational excellence and competitive performance, healthcare firms must adopt a lean mentality and look for high-quality, cost-effective solutions.

Moreover, this research findings highlighted the importance of lean practices and quality improvement for the hospital management to provide better service while reducing services cost, transportation and cheap medical equipment availability to increase patient satisfaction and competitive advantage.

7. Recommendations and limitations

This research supports the concept of organisational development procedure in the context of quality improvement. Healthcare companies should apply business management practices in the overall departments to find the deficiencies. The strategic implementation will be necessary to overcome the deficiencies to get competitive performance. Furthermore, the researchers point out some limitations, as this research is limited to one city-based healthcare provider in UAE. For future studies, it is recommended to go for multiple geographical areas to increase generalizability, and future studies must be focused on more practices dependency in the healthcare industry to increase additional knowledge.

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