Original Article :

Assessment of Continuous Quality Improvement in Healthcare Organizations: A Cross-Sectional Study in Saudi Arabia

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Abstract

Background and Aims:
Continuous Quality Improvement (CQI) fosters a culture of ongoing improvement, which helps organizations determine their impact, optimize resource allocation, and sustain improvements over time. This study aimed to assess the continuous quality improvement at a tertiary care hospital in Riyadh, Saudi Arabia. .

Methods:
A descriptive cross-sectional study was conducted using a self-administered questionnaire sent electronically to King Fahad Medical City healthcare providers. The questionnaire includes three sections: (1) Demographic characteristics, (2) Assessment of the organization as a whole, such as character, managers, cohesion, emphases, and rewards, and (3) Assessment of quality improvement in the organization.

Result:
Among the 364 participants included in this study, 66.5 % were female, and the mean age of the participants was 34.81 ±8.3 years. The organization character domain took the first rank with a weighted mean of 3.64±0.95, followed by organization cohesion with a weighted mean of 3.62±0.94, while the organization rewards domain took the last rank with a weighted mean of 3.24±0.99. For the quality improvement criteria, the information and analysis about the quality of care took the first rank with a weighted mean of 3.61±1.12, followed by quality management with a weighted mean of 3.60±1.03, while human resource utilization took the last rank with a weighted mean of 3.28±1.01.

Conclusion:
The study provides valuable insights into the strengths and weaknesses of the organization concerning quality improvement. By prioritizing the enhancement of reward systems and focusing on organizational character and cohesion, the organization can create a more supportive environment for quality improvement initiatives. Additionally, addressing the challenges related to human resource utilization will be essential for maximizing the potential of the workforce in achieving the organization's quality goals.

Keywords:
Quality, Continuous Quality Improvement, Healthcare, Saudi Arabia

Introduction:

Continuous Quality Improvement (CQI) is a systematic, ongoing effort to enhance healthcare services, patient outcomes, and organizational efficiency.[1] This initiative has gradually gained traction within the healthcare industry, underscoring its importance in elevating the quality of health systems.[2] The assessment of CQI initiatives becomes important to ensure effectiveness, sustainability, and alignment with organizational goals.[3] It is necessary to find a way to assess the outputs of healthcare systems; the quality management system can help in this assessment process, as it is the level to which health facilities incorporate quality assurance principles and strategies in their healthcare management structure. Key concepts within this framework include data evaluation, leadership, strategic quality planning, human resource utilization, quality control, quality outcomes, and customer satisfaction.[4,5] These elements collectively contribute to the successful implementation of CQI approaches, which have been shown to enhance adherence to best practice clinical guidelines and improve the regularity of client attendance.[6] Furthermore, the implementation of CQI methodologies has fostered the development of a dedicated CQI workforce, established appropriate health system supports, and encouraged engagement with other organizations and community members.[3]

Building upon the foundational principles of CQI, the Saudi Vision 2030 aims to transform the healthcare system by elevating healthcare standards and improving patient outcomes. The Saudi National Transformation Program (NTP), identified by the Ministry of Health, outlines Strategic Objective 2.1.2: to improve the quality and efficiency of healthcare services. This objective seeks to enhance the overall value provided to beneficiaries by improving the quality and efficiency of healthcare services while ensuring the safety of healthcare facilities and adequate coverage with financial sustainability.[7,8]

Research indicates that organizations with structured assessment processes tend to sustain improvements longer and achieve better patient outcomes.[4] In this context, Saudi Arabia's healthcare sector has experienced significant growth, characterized by an expansion of healthcare facilities, increased health investments, and a heightened focus on accreditation and quality assurance. However, despite these advancements, disparities in healthcare delivery and clinical outcomes persist across various regions and institutions. The integration of CQI methodologies is viewed as a strategic approach to address these chal-

lenges, fostering a culture of continuous improvement throughout the healthcare system. [9]

Research gap:

Despite the progress made, a notable research gap exists. Based on the existing literature, there is a pressing need for a comprehensive assessment of CQI practices across various dimensions in Saudi tertiary hospitals. Previous studies have often concentrated on isolated aspects of CQI, neglecting a holistic view of its implementation. Moreover, there has been insufficient exploration of context-specific strategies that can effectively tackle the unique challenges faced by Saudi hospitals in implementing and sustaining CQI initiatives. This study aims to bridge these gaps by providing a detailed analysis of CQI implementation, ultimately leading to improved patient care and safety. Specifically, it will focus on measuring organizational culture according to five dimensions: organizational character, managerial effectiveness, cohesion, emphasis, and rewards. Organizational character is defined as the relatively stable characteristics that distinguish one organization from another [10]. Organizational cohesion reflects the dynamic process in which a group remains united in pursuit of its goals and objectives[11]. Additionally, reward systems in organizations encompass both monetary and non-monetary incentives provided to employees in exchange for their work, serving to attract, motivate, and retain talent [12].

Significance of the study:

The implementation of Continuous Quality Improvement in Saudi hospitals is crucial for enhancing service delivery and aligning with national health objectives. For instance, a study conducted by Abduljawad (2022) demonstrated reductions in hospital-acquired infection rates and improved surgical outcomes following CQI interventions.[13] Furthermore, patient satisfaction surveys indicate enhancements in service delivery, which can be partially attributed to the adoption of CQI practices. [14] The assessment of CQI in healthcare organizations is vital for validating efforts, guiding strategic decisions, and fostering a culture of excellence.[15] While challenges remain, leveraging advanced data tools, engaging staff, and adopting proven frameworks can significantly enhance the effectiveness of CQI initiatives. This study aims to assess continuous quality improvement at a tertiary care hospital in Riyadh, contributing to the ongoing efforts to elevate healthcare standards in the region.

Methods:

Study design: The study was a cross-sectional study.

Settings: King Fahad Medical City in Ri-

yadh, a tertiary hospital with a total capacity of 1200 beds.[16]

Study participants:

The target population of this research study was Saudi and non-Saudi healthcare providers working in King Fahad Medical City who agreed to participate in the study.

Data Collection:

A self-administered questionnaire was sent electronically via Google Forms and shared through participants' email addresses. The questionnaire included the following three sections:

- Section I: Was developed by the researchers and includes sociodemographic characteristics of participants such as age, occupation, years of experience, and gender.
- Section II: Assessed the organization as a whole, and included five domains: Organization Character (4 statements) Organization's Managers (4 statements), Organization Cohesion (4 statements), Organization Emphases (4 statements), and Organization Rewards (4 statements), which were adapted from Quinn (1985) and Di Stefano et al. (2016);[17,18] each of these items contained four descriptions of healthcare organizations. The answer indicated the type of organization the institution likes for each item by using a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) The means of five Likert scale were calculated which give "strongly agree" five degrees (from 4.21 to 5.00), "agree" four degrees (from 3.40 to 4.20), "neutral" three degrees, (from 2.61 to 3.39) "disagree" (from 1.81 to 2.60) two degrees and "strongly disagree" one degree (from 1 to 1.80). The cut-off point of the weighted mean is equal to 3.39.
- Section III: Which is concerned with quality improvement in the organization, and includes seven categories: leadership, using a wide range of information to improve the quality of care, involvement of the employees in quality planning, human resource utilization, quality management, quality outcomes, and customer satisfaction), which developed by the researchers and the degree of CQI implementation was measured using the Malcolm Baldrige National Quality Award Criteria (MBNQAC).[19] The answer indicates the extent to which the participant agrees or disagrees that the statement characterizes the organization using a 5-point Likert scale

Validity and reliability:

A pilot study was performed on 20 participants, excluded from the sample size to detect any ambiguity in the tool and the clarity of the items and to determine the

time consumed to fill in the questionnaire. The questionnaire's reliability was assured using Cronbach's alpha coefficient for the 20 items of assessment of the organization as a whole (α=0.957), Cronbach's alpha coefficient for the 58 items of quality improvement in the organization (α=0.990), and Cronbach's alpha coefficient for the questionnaire as a whole (α=0.988).

Sample Size and Technique: The total number of healthcare providers in KFMC is 4600. To achieve accurate results and have a more representative sample selected randomly using a simple random sample technique, according to Thompson's equation for calculation of sample size,[20], the minimum required sample size was 355 using the following equation, which was upgraded to 365 to consider the impact of possible non-response:

$$n = \frac{[N \times p(1-p)]}{\left[\left[N-1 \times \left(\frac{d^2}{z^2}\right)\right] + p(1-p)\right]}$$

$$n = \frac{[4600 \times 0.5(1-0.5)]}{\left[\left[4600 - 1 \times \left(\frac{0.05^2}{1.96^2}\right)\right] + 0.5(1-0.5)\right]}$$

n = 355

Where,

n: Sample size

N: population size (4600)

Z: Confidence level at 95% (1.96)

d: Error proportion (0.05)

p: Probability (50%)

Data Analysis: Data was analyzed using IBM SPSS, version 22. For continuous data, descriptive statistics are shown as the mean (M) and standard deviation (SD), whereas for categorical and ordinal data, they are shown as percentages (%) and frequencies. Pearson correlation coefficient tests (r) are used to determine the Correlation between the organization's domains and quality improvement. A result of p 0.05 was thus regarded as statistically significant because the analysis was conducted at a 95% confidence level. Multiple regression analysis was used to assess which organizational domain was the strongest predictor of quality improvement in KFMC.

Ethical Considerations:

We obtained ethical approval from the King Fahad Medical City IRB committee with Log Number: 21- 092E. Although participation was voluntary, participants had the right to refuse to participate in the study with electronic written informed consent. All answers are maintained in confidentiality. Participants were provided detailed information about the study's purpose, procedures, potential risks, and benefits. Informed consent was secured before participation. Participation was entirely voluntary, and confidentiality of respondents' information was strictly maintained

throughout the study.

Results:

Respondents' Characteristics

A total of 364 respondents were included in the study; their mean age is 34.81±8.3. Of the respondents, the majority (66.5%) were female. Less than half of the respondents (48.4%) are nurses, followed by healthcare administrators (22.6%) and physicians (19%). The majority were not working as members of the QI committee (69.8%) (Table 1).

Table 1: Distribution of the study's participants according to their socio-demographic characteristics (n=364).

Parameters	(%) Frequency	
Age (in years)		
Mean ± SD	34.81±8.3	
Gender		
Male	122	33.5
Female	242	66.5
Current profession		
Physician	69	19
Nurse	176	48.4
Healthcare administrator	82	22.6
Others	37	10.2
Years of Experience		
<1 year	23	6.3
1 to 5 years	99	27.2
6-10 years	105	28.8
> 10 years	137	37.6
Member of a Quality improvement committee		
Yes	110	30.2
No	254	69.8

Assessing the organization as a whole :and its quality improvement criteria

When assessing the responses to the survey regarding the organization as a whole, we found that the organization character domain took the first rank with a weighted mean of 3.64±0.95, followed by organization cohesion with a weighted mean of 3.62±0.94. In contrast, the organization rewards domain took the last rank with a weighted mean of 3.24±0.99, which is less than the cut-off point of 3.39 (Table 2).

Table 2: Descriptive statistics for domains of the organization as a whole and its quality improvement (n=364).

Parameter	Weighted mean ± SD	Rank
The organization as a whole:		
Organization Character Domain	3.64±0.95	1
Organization's Managers' Domain	3.58±0.91	3
Organization Cohesion Domain	3.62±0.94	2
Organization Emphases Domain	3.44±0.85	4
Organization Rewards Domain	3.24±0.99*	5
Quality improvement (QI) in the organization		
Leadership	3.33±1.19	6
Information and analysis about the quality of care	3.61±1.12	1
Strategic quality planning	3.48±1.02	5
Human resource utilization	3.28±1.01*	7
Quality management	3.60±1.03	2
Quality results	3.59±1.01	3
Customer satisfaction	3.54±1.02	4
Total Quality Improvement (TQI)	**3.49±0.94**	

*Cut-off point is 3.39

For the quality improvement criteria, the results of the current study showed that in-

formation and analysis about the quality of care took the first rank with a weighted mean of 3.61±1.12 followed by quality management with a weighted mean of 3.60±1.03 while human resource utilization took the last rank with a weighted mean of 3.28±1.01 which is less than cut-off point 3.39 (Table 2)

Relationship between domains of the organization as a whole and TQI:

To investigate the connection between the organization's domains and overall quality improvement, correlation and multiple regression analyses were performed (TQI).

(Table 3) summarizes the correlation between the organization as a whole domain and TQI. As can be seen, each organization's whole domain scores are positively and significantly correlated with the TQI.

Table 3: Correlation between the domains of the organization as a whole and Total Quality Improvement (TQI).

Variables	TQI	
	r	P value
Organization Character	0.379	0.00**
Organization's Managers	0.472	0.00**
Organization Cohesion	0.479	0.00**
Organization Emphases	0.506	0.00**
Organization Rewards	0.472	0.00**

Note. Pearson's correlation coefficient is used with continuous quantitative variables

*Correlation is significant at the 0.05 level (2-tailed).

**Correlation is highly significant at the 0.001 level (2-tailed).

Multiple regression was carried out (Table 4) to investigate which domains are the most significant predictors of an organization's quality improvement. The results of the regression showed that the model was a significant predictor of TQI, F (5.358) = 30.58, p = .000. Organization rewards contributed significantly to the model (B = 0.221, p<.001), followed by organization emphases (B=0.221, p < 0.05). In contrast, other domains don't contribute significantly with p> 0.05.

Table 4: Multiple regression model for exploring the predictors of TQI.

Model*	B	t	p-value	95%CI for OR	
				Lower bound	-Upper bound
Organization Character	-0.095	-1.218	0.224	-0.25	0.059
Organization's Managers	0.154	1.919	0.056	-0.004	0.312
Organization Cohesion	0.068	0.680	0.49	-0.129	0.265
Organization Emphases	0.237	2.564	0.011**	0.055	0.420
Organization Rewards	0.221	3.523	0.000**	0.097	0.344

Dependent Variable: Total Quality Improvement

Discussion:

Continuous Quality Improvement has become an integral component of healthcare reform in Saudi Arabia, contributing to improved clinical outcomes, patient safety, and service quality. While progress is notable, addressing barriers such as organizational resistance and resource limitations is crucial for sustaining and expanding CQI initiatives.[21] CQI initiatives vary significantly across countries as it influenced by local healthcare systems, cultural contexts, and available resources. A systematic review done by Gage D., et al. (2022) highlighted that while many high-income countries report improvements in quality through CQI, the effectiveness can be inconsistent, particularly in low- and middle-income countries, where studies often show mixed results due to methodological limitations [22]. The results of the current study revealed various crucial findings. First, the findings indicate that the organization character domain ranks highest, closely followed by organization cohesion. The close weighted mean for both domains (3.64 and 3.62) implies that they are viewed as equally important by the respondents, with a slight preference for the organization character domain. This could indicate that the character of the organization—its values, ethics, and overall identity—plays a crucial role in fostering cohesion among its members. Furthermore, these results suggest that the foundational aspects of the organization, such as its values, culture, and the cohesiveness among its members, play a crucial role in fostering an environment conducive to quality improvement. These results align with findings from other studies that highlight the significance of both organizational character and cohesion in shaping a positive organizational environment. The slight edge in the character domain suggests that organizations might benefit from focusing on their core values and identity to strengthen overall cohesion among employees.[5,23,24]

In contrast, the current study showed that the organization rewards domain ranked the lowest with a weighted mean of 3.24±0.99, falling below the established cut-off point of 3.39. This finding is particularly concerning as it indicates that the current reward systems may not effectively motivate employees or recognize their contributions to quality improvement efforts. The lack of emphasis on rewards could lead to decreased morale and engagement among staff, ultimately hindering the organization's ability to achieve its quality improvement goals. It is beneficial for the organization to reassess its reward structures to ensure they align with the de-

sired outcomes of quality care and employee satisfaction. These results come on the same line of the study done in China by Zhang, Z. and Min, M. (2021) and study done in Saudi Arabia by Shamsuddin (2018) which focused on identifying organizational characteristics that affect the implementation of quality improvement in Saudi hospitals, the findings indicated significant barriers to CQI, including organizational culture, human resource management, and structural issues. The study emphasized that effective human resource utilization and supportive quality management systems are crucial for successful CQI implementation.[5,25] Alhawajreh, et al. (2023) mentioned that the low ranking of organizational rewards may reflect a broader issue within the healthcare sector in Saudi Arabia, where recognition and incentives for quality improvement efforts are often lacking.[23]

When examining the quality improvement criteria, the results showed that information and analysis about the quality of care ranked highest with a weighted mean of 3.61±1.12, followed closely by quality management at 3.60±1.03. These findings highlight the importance of data-driven decision-making and effective management practices in enhancing the quality of care provided by the organization. The emphasis on information and analysis suggests that the organization values evidence-based practices, which are essential for identifying areas for improvement and implementing effective interventions. This result comes in agreement with the studies done by Al-Najmi et al. (2024) and Alluhaymid et al. (2023), who highlight the importance of data-driven decision-making in enhancing quality management practices. The consistent ranking of quality management as a priority suggests a shared understanding of its critical role in improving healthcare outcomes. [26,27]

Conversely, human resource utilization ranked the lowest among the quality improvement criteria with a mean of 3.28±1.01, also below the cut-off point of 3.39. This indicates potential inefficiencies in how human resources are managed and utilized within the organization. Effective human resource management is critical for ensuring that the right skills and competencies are in place to support quality improvement initiatives. Addressing this gap involves investing in training and development programs, as well as optimizing staffing strategies to better align with the organization's quality objectives. These results come in agreement with the study done by Al-Najmi et al. (2024), who assessed the quality improvement and patient safety ed-

ucation among healthcare professionals in Saudi Arabia and found that while there is a general interest in quality improvement, many healthcare professionals expressed dissatisfaction with current training methodologies.[26] The study done by Aljawharah, et al. (2023) indicates that effective human resource management is often a challenge in Saudi healthcare settings.[23] This suggests a need for targeted interventions to enhance workforce engagement and utilization in quality improvement efforts.

The multiple regression analysis further elucidates the predictors of total quality improvement (TQI) within the organization. The model demonstrated a significant predictive capability and indicating that certain organizational domains are more influential in driving quality improvement than others. Notably, the organization rewards and organization emphases domains emerged as significant contributors to the model, with both showing a positive relationship with TQI. This emphasizes the importance of recognizing the value of rewards and organizational priorities in fostering a culture of quality improvement. In contrast, other domains did not contribute significantly to the model, suggesting that while they play a role in the overall functioning of the organization, they are not as critical in predicting quality improvement outcomes. This finding highlights the need for the organization to focus its efforts on enhancing the reward systems and reinforcing organizational emphases to drive quality improvement effectively. CQI can lead to improved healthcare outcomes, but the degree of success often depends on the specific CQI model used and the healthcare setting. A systematic review done by Hill, et al., (2020) found that collaborative approaches, such as team-based problem-solving, were more effective in enhancing quality compared to isolated training or supervision efforts [28].

Limitations of the study:

The study presents several limitations that should be acknowledged:

First, the inherent nature of cross-sectional studies limits the ability to draw causal inferences. Second, conducting the study within one institution “King Fahad Medical City” raises concerns about the generalizability of the findings, because results may not apply to other settings or populations, as unique institutional factors could influence outcomes. Third, the reliance on online self-reported data introduces potential biases, such as memory inaccuracies and social desirability bias.

Conclusion:

In conclusion, the results of the current study provided valuable insights into the strengths and weaknesses of the organization concerning quality improvement. By prioritizing the enhancement of reward systems and focusing on organizational character and cohesion, the organization can create a more supportive environment for quality improvement initiatives such as creating a structured performance-based incentive program that rewards healthcare professionals for achieving specific quality improvement metrics. Such a system has been shown to motivate staff and improve service delivery. Additionally, addressing the challenges related to human resource utilization will be essential for maximizing the potential of the workforce in achieving the organization's quality goals. The organization should ensure that all reward and incentive programs align with the broader objectives of Saudi Vision 2030, which emphasizes quality, accessibility, and efficiency in healthcare. This alignment will not only enhance the effectiveness of CQI programs but also ensure that they contribute to the national health transformation agenda. Future research, such as a longitudinal or mixed-methods approach, could provide deeper insights into CQI trends over time and explore the specific factors within the reward systems and organizational emphases that most significantly impact employee motivation and engagement in quality.

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