ORIGINAL ARTICLE

Quality improvement in hospital: How knowledge and attitude affect job performance across different professional groups

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ABSTRACT

Objective: Improving the performance of healthcare organizations is a major concern within health systems. This study aims to explore the relationship between hospital staff's knowledge and attitudes about continuous quality improvement (CQI) and their perceived job performance while determining if professional groups moderate this relationship.
Methods: A total of 250 questionnaires were distributed among three main job groups at a public hospital in Iran. Statistical analysis included variance-based structural equation modeling and Pearson correlation coefficients.
Results: Of the 250 distributed questionnaires, 196 were returned (response rate: 78%). The path coefficient between staff knowledge and performance was 0.390 higher in the physician group than in the non-physician group, and 0.207 higher in the administrative-financial group. The path coefficient for the non-physician group was 0.120 higher than that of the administrative-financial group. For staff attitudes and performance, the path coefficient was 0.160 higher in the physician group than in the non-physician group, and 0.090 higher than in the administrative-financial group. The administrative-financial group had a 0.070 higher path coefficient than the non-physician group.
Conclusions: The study indicates positive relationships between hospital employees' knowledge and attitudes about quality improvement and their job performance. These relationships were not significantly moderated by professional groups.

Key Words: Knowledge, Attitude, Quality improvement, Job performance, Hospital personnel

1. INTRODUCTION

For decades, healthcare organizations worldwide have sought ways to improve their performance to deliver high-quality and efficient services.[1] The quality, efficiency, and equity of services depend on effective operational systems, as well as human resource strategies that foster skilled professionals' emotional attachment to the organization's goals.[2]

Job performance (JP) has been defined as the degree to which employees perform their jobs under certain conditions to achieve the organization's goals.[3] JP results from the synergy of individual-organizational characteristics, including skill, effort, and working conditions. The optimal combi-

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nation of these variables can increase job performance.[4] Performance is considered effective in the healthcare context whenever employees focus their energy on meeting predetermined goals and patient requirements[5] to provide them with the best service possible.

Several factors contribute to job performance in the healthcare system, including personal characteristics,[6,7] work environment[8,9] job satisfaction,[10–12] commitment and expectations.[13,14] For example, a study on nursing performance in Riyadh revealed a positive correlation between job performance and organizational commitment, job satisfaction, and various personal and professional variables.[10]

In the quest for improved performance, particularly within hospitals, continuous quality improvement (CQI) has emerged as a vital strategy since the early 2000s.[15,16] Implementing CQI in hospitals, which involves a wide range of healthcare professionals with diverse roles and responsibilities, presents significant challenges.[17] Training health professionals with the appropriate knowledge and tools is essential for the successful application and development of CQI.[18] In the study of evaluating training programs for QI in Spain, the researcher has shown that the QI training program increased professionals' knowledge significantly in the posttest after training as well as after a one-year follow-up survey. Researchers have calculated that QI training programs are needed to involve health professionals in QI practice and that QI training programs may increase their effectiveness by using problem-solving oriented and trainee centered methods.[18] However, most studies have focused on participants' perceptions rather than the benefits to patients.[19]

The importance of training programs in enhancing health professionals' knowledge and attitudes toward quality improvement is well-documented. However, the benefits of such training are not evenly distributed across professional groups. For example, frontline workers like nurses often receive less formal training in CQI and may not apply its principles as consistently in their daily activities.[15] Similarly, a study on physician training and participation in QI found that most physicians rated their knowledge as novice-level, with less than half considering their training to be adequate.[20] Despite extensive investment in CQI training by institutions like Isfahan University of Medical Sciences, which has implemented comprehensive quality management across government hospitals for over a decade (emphasizing training managers and staff through workshops and sessions on focus-Plan-Do-Check-Act (PDCA)strategy training), there has been no evaluation of the training programs' success or their impact on staff knowledge, attitudes, and job performance.

This study aims to fill this gap by examining the relationships between hospital staff's knowledge and attitudes about CQI and their perceived job performance, while also exploring the potential moderating effect of professional groups. Understanding these relationships is crucial for healthcare managers and policymakers to design effective training programs and strategies that can enhance job performance across different professional groups in hospitals.

Hypotheses

We have focused on the following two hypotheses to find correlations between staff knowledge and attitude toward CQI and their perceived job performance.

H1: There is a positive relationship between employees' knowledge of CQI and their job performance, and professional groups moderate this relationship.

H2: There is a positive relationship between employees' attitude towards CQI and their job performance, and professional groups moderate this relationship.

2. METHODS

This study was conducted in a public hospital in Isfahan Province, Iran. Using the Cochran formula, the sample size was determined to be 196 with a 95% confidence level. Stratified sampling was used to distribute questionnaires among physicians, diagnostic and therapeutic staff (non-physicians), and administrative-financial staff. A total of 196 completed questionnaires were returned from 250 distributed (response rate: 78%).

2.1 Measurements

• Job Performance: Measured using the Paterson Standard Job Performance Questionnaire (1989) with 15 items rated on a four-point scale (always-often-sometimes-rarely).

• Staff Attitude: Assessed using the Attitude of Employee in Continuous Quality Improvement questionnaire by Ghazini (2001), with 20 items rated on a five-point Likert scale.

• Awareness and Knowledge of CQI: Measured using a self-designed multiple-choice quiz with 16 questions, scored as 1 for correct answers. Scores below eight indicated low knowledge, while scores of eight or above indicated satisfactory knowledge. The validity of the questionnaires was confirmed by experts, and reliability was tested using Cronbach's alpha (0.853 for Job Performance, 0.796 for Staff Attitude, 0.833 for Staff Knowledge).

2.2 Data analysis

The data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 25 and variance-

based structural equation modeling software (WARP PLS 6.0). Descriptive and inferential statistics were conducted at two levels. Initially, descriptive statistics, including frequencies, mean scores, and standard deviations, were calculated for the staff group. Table 1 presents these descriptive statistics, showing the mean, standard deviation, minimum, and maximum values for each research variable and their dimensions. Average scores for each item and an overall measure were obtained by calculating the total average across all items. Following this, the data distribution was assessed using the Kolmogorov-Smirnov test. The main hypotheses of the study were then tested using variance-based structural equation modeling and Pearson's correlation coefficient. Warp PLS software was utilized to perform multi-group analyses, which helped determine the moderating effect of professional groups on the relationship between staff knowledge and performance.[21]

3. RESULTS

A total of 196 completed questionnaires were returned, resulting in a response rate of 78%. The respondents included 17 physicians, 132 diagnostic and therapeutic staff, and 46 administrative staff. Table 1 provides the demographic and work-related characteristics of the respondents. The sample consisted predominantly of women (63%). The educational background of the respondents was as follows: 14% had a two-year college diploma, 67% held a bachelor's degree, and 18% had a graduate degree. In terms of work experience, 33.7% had six to ten years, 30.6% had less than five years, and 34% had more than ten years of experience. Most respondents (65%) had permanent and long-term contracts with the hospital (see Table 1).

3.1 Descriptive analysis of main research variables

Table 2 presents the descriptive analysis of the research variables. Overall performance was rated at 3.392 out of 4, corresponding to a "good" rating. Average job performance scores for the three groups were high: physicians (3.328), diagnostic and therapeutic staff (3.307), and administrative staff (3.543). The overall staff attitude averaged a moderate score of 3.021 out of 5. The mean score for staff knowledge regarding quality improvement was relatively high, at 9.680 out of 16 (see Table 2).

3.2 Inferential findings

The Kolmogorov-Smirnov test indicated that the significance level in job performance variables, staff attitude, and staff knowledge is higher than 0.05, implying a normal distribution of data. Therefore, parametric tests were used to check the data.

Table 1. Demographic and work-related characteristics of respondents

Personal and professional characteristics		Frequency (%)
Gender	Female	124 (63%)
	Male	69 (35%)
	Not specified	3 (1.5%)
Educational level	Doctor of medicine	17 (9%)
	Master's degree	18 (9%)
	Bachler degree	132 (67%)
	Two years diploma	28 (14%)
	High school	0 (0%)
	Not specified	1 (0.5%)
Professional group	Physicians	17 (14%)
	Diagnostic and therapeutic groups (non-physician)	132 (59%)
	Administrative-financial staff	47 (26.5%)
Employment status	Permanent	38 (19%)
	Long term contract (more than three years)	91 (46%)
	Short term contract (one year)	28 (14%)
	Internship period (after graduated of collage)	34 (17%)
	Not specified	5 (2.5%)

Table 2. Descriptive analysis of main research variables in this study

Main variables	Staff group	Mean	Standard Deviation	Minimum Value	Maximum Value
Job Performance	Physicians	3.328	0.400	2.67	4
	Diagnostic and therapeutic groups (non-physician)	3.307	0.526	1.33	4
	Administrative-financial staff	3.543	0.333	2.73	4
Staff Attitude	Physicians	2.955	0.780	1.65	4.9
	Diagnostic and therapeutic groups (non-physician)	3.102	0.620	1.5	4.85
	Administrative-financial staff	3.008	0.910	1.5	4.9
Staff Knowledge	Physicians	9.470	3.384	1	14
	Diagnostic and therapeutic groups (non-physician)	9.742	3.430	1	15
	Administrative-financial staff	9.829	3.331	3	15

3.3 Staff knowledge and staff performance

Table 3 displays the results of the multi-group analysis examining the relationship between staff knowledge and job performance across different staff groups.

• Physicians vs. Diagnostic and Therapeutic Staff: The regression coefficient for physicians was 0.77 (SE = 0.146, $p < .001$), compared to 0.38 (SE = 0.080, $p < .001$) for the diagnostic and therapeutic staff. The *t*-statistic was 1.709 ($p = .090$), leading to the rejection of H1.

• Physicians vs. Administrative and Financial Staff: The regression coefficient for physicians was 0.77 (SE = 0.164, $p < .001$), while it was 0.50 (SE = 0.120, $p < .001$) for the administrative and financial staff. The t-statistic was 1.253 ($p = .215$), leading to the rejection of H1.

• Administrative and Financial Staff vs. Diagnostic and Therapeutic Staff: The regression coefficient for administrative and financial staff was 0.50 (SE = 0.120, $p < .001$), compared to 0.38 (SE = 0.080, $p < .001$) for the diagnostic and therapeutic staff. The *t*-statistic was 0.002 ($p = .999$), leading to the rejection of H1.

Overall, while the relationship between staff knowledge and job performance was positive and significant within each group ($p < .001$), the differences between groups were not statistically significant at the 95% confidence level.

Table 3. Multi-group analysis (Staff knowledge and job performance)

	Physician	Diagnostic and therapeutic groups	Physician	Administrative-financial staff	Administrative-financial staff	Diagnostic and therapeutic groups
Sample size	17	132	17	47	47	132
Regression coefficient	0.77	0.38	0.77	0.50	0.50	0.38
Significance of regression coefficients	$p < .001$	$p < .001$	$p < .001$	$p < .001$	$p < .001$	$p < .001$
Standard error	0.146	0.080	0.164	0.120	0.120	0.080
t-statistic	1.709		1.253		0.002	
p-value (2-tailed)	.090		.215		.999	
Result	Reject H1		Reject H1		Reject H1	

Table 4. Multi-group analysis of staff attitude and job performance

	Physician	Diagnostic and therapeutic groups	Physician	Administrative-financial staff	Administrative-financial staff	Diagnostic and therapeutic groups
Sample size	17	132	17	47	47	132
Regression coefficient	0.59	0/43	0/59	0/50	0/50	0/43
Significance of regression coefficients	$p < .001$	$p < .001$	$p < .001$	$p < .001$	$p < .001$	$p < .001$
Standard error	0.164	0.079	0.164	0.120	0.120	0.079
t-statistic	0.705		0.410		0.467	
p-value (2-tailed)	.482		.683		.641	
Result	Reject H1		Reject H1		Reject H1	

3.4 Staff attitude and job performance

Table 4 shows the multi-group analysis results for the relationship between staff attitude towards CQI and job performance.

• Physicians vs. Diagnostic and Therapeutic Staff: The regression coefficient for physicians was 0.59 (SE = 0.164, $p < .001$), compared to 0.43 (SE = 0.079, $p < .001$) for the diagnostic and therapeutic staff. The t-statistic was 0.705 ($p = .482$), leading to the rejection of H1.

• Physicians vs. Administrative and Financial Staff: The regression coefficient for physicians was 0.59 (SE = 0.164, $p < .001$), while it was 0.50 (SE = 0.120, $p < .001$) for the

administrative and financial staff. The t-statistic was 0.410 (p = .683), leading to the rejection of H1.

• Administrative and Financial Staff vs. Diagnostic and Therapeutic Staff: The regression coefficient for administrative and financial staff was 0.50 (SE = 0.120, $p < .001$), compared to 0.43 (SE = 0.079, $p < .001$) for the diagnostic and therapeutic staff. The t-statistic was 0.467 (p = .641), leading to the rejection of H1.

Similarly, the relationship between staff attitude and job performance was positive and significant within each group ($p <$ .001), but the differences between groups were not significant at the 95% confidence level.

4. Discussion

The present study aimed to elucidate the relationship between employees' knowledge and attitudes towards CQI and their perceived job performance in a hospital setting. In this complex and multidisciplinary context, which manages substantial financial and non-financial resources within the health system,[22] it is crucial to constantly enhance quality and performance by equipping personnel with the appropriate motivation, knowledge, and attitude to foster a sustainable organizational culture.[23]

The primary finding of this study indicates a positive and significant relationship between staff knowledge regarding CQI systems and perceived job performance across all three professional categories. This relationship remained consistent across physicians, diagnostic and therapeutic staff, and administrative staff, with no significant differences observed among the groups. This suggests that the organizational level of staff does not moderate the relationship between knowledge of CQI and job performance.

Similarly, the study found a positive and significant relationship between attitudes towards CQI and job performance across all three job categories. Again, there were no significant differences among physicians, diagnostic and therapeutic staff, and administrative staff. This implies that fostering a positive attitude towards CQI universally enhances job performance, irrespective of professional group.

Few studies have explored the association between employees' knowledge of CQI and job performance across different professional categories. Molina et al. asserted that quality management positively influences knowledge transfer, impacting a firm's resources, capabilities, and competitive advantage.[24] It also has been highlighted that the Total Quality Management (TQM) factors concerning customers, employees, and top management significantly affect the performance dimensions.[25] One study indicated that companies that adopt process innovation strategies obtain improvements in their performance, both operationally and financially. In contrast, product innovation only provides gains in the financial performance of organizations.[26]

Since the QI approach is a process-based improvement through structured problem-solving techniques by a multidisciplinary trained and acknowledgeable team,[27] its success depends on the interdependent actions of individuals who share essential knowledge for process improvement. Engaging staff in cross-disciplinary process improvement teams and involving them in problem-solving, collaborative decision-making, planning, and testing improvement plans help mitigate undesirable variations in healthcare quality.[27] Thus, staff knowledge regarding CQI systems, when integrated into daily activities, can incrementally improve various operational facets, meet customer expectations, and enhance overall performance. Consequently, training and enhancing knowledge about CQI are crucial for both employees and managers at different levels. Expanding knowledge and innovation in process improvement is fundamental to enhancing healthcare quality.[23]

While no research was found on the moderating role of professional groups in the relationship between attitudes towards CQI and job performance, existing studies support the notion that training programs significantly improve professionals' attitudes towards CQI. For instance, Siverbo et al. noted that even short-term CQI training promotes positive attitudes.[28] Francois et al. evaluated the implementation of a CQI program in a tertiary hospital in France, finding that compliance with guidelines, attitudes, and motivation increased post-intervention, though knowledge transmission to untrained staff was limited. This underscores the need for comprehensive training programs that involve all staff members.[29] Another study has highlighted that implementing Strategic Collaborative Quality Management (SCQM) in a public hospital improved satisfaction among employees, clients, and suppliers, enhanced organizational productivity, and fostered a culture of continuous improvement. These outcomes were linked to top management's active support, employee commitment, education and training, customer focus, supplier relations, and appropriate quality management methods.[30]

It should be noted that the organizational level in this study does not differ significantly at any of the three levels. Employees' attitude towards a CQI system invariably leads to the improvement of employees' job performance. In the medical job category, it can be explained that this group has a significant role in the hospital's mission, and therefore the slightest mistakes by medical staff can lead to sentinel adverse events. Creating a positive attitude in quality im-

provement within this group of staff can result in a positive organizational climate achieving sustainable progress toward achieving patient expectations. The administrative and financial sector can also be at risk for an organization's economic and documentation issues, so it can be inferred that if the administrative staff maintain a positive attitude towards the CQI program, this will lead to better performance in their jobs.

Long-term success in CQI requires changes in knowledge and attitude and behavioral changes of all staff of hospital setting, professional staff who are working in frontline delivering a wide range of clinical and diagnostic services, and personnel who are supporting and facilitating services delivery. Training on quality improvement principles, techniques, and methods alongside practicing this knowledge in daily activities can promote their knowledge and attitudes regarding quality improvement and lead to better job performance. Therefore, health systems policymakers and managers in different organizational levels seeking to improve the quality of services in their systems need to utilize comprehensive approaches in engaging all staff in quality improvement activities.

The findings of this study align with the assertions of Willis et al., who emphasized that sustaining organizational culture change is essential for CQI in health systems.[31] The positive relationship between staff knowledge of CQI systems and job performance underscores the need for ongoing education and reinforcement of CQI principles. This sustained approach ensures that CQI becomes an integral part of the organizational culture, leading to lasting improvements in performance. Moreover, the role of leadership in fostering a supportive environment for CQI cannot be overstated.[31–33] This involves not only initial training but also continuous engagement and support for staff at all levels.

Study limitations

This study has several limitations. Since it was based on a specific public general hospital, the findings cannot be generalized. To generalize, data should be sampled randomly from various types of hospitals. Additionally, researcher bias may be present since the quantification of knowledge, attitudes, and perceived job performance is subjective and self-reported. Self-reported measures might suffer from common method variance and social desirability bias. A more comprehensive study using a combination of qualitative and quantitative techniques is recommended. This study was conducted across three professional categories; future studies could explore different organizational levels, such as managers and frontline staff.

5. Conclusion

This study investigated the relationship between employees' knowledge and attitude regarding CQI and their job performance to enhance hospital operations. The findings indicate that knowledge and attitudes towards CQI can improve job performance, and this association is consistent across different professional groups. This suggests that improving staff knowledge and attitude may positively impact the entire hospital staff and overall hospital performance.

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Author contribution

Somaye Afshari (co-author) was responsible for the conception and design of the study, as well as data collection. Maryam Pirouzi (first author and corresponding author) contributed to data analysis, interpretation, and writing the paper. Both authors have reviewed and approved the final manuscript for submission.

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Conflicts of Interest Disclosure

The authors declare they have no conflicts of interest.

Informed consent

Obtained.

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Data availability statement

The data that support the findings of this study are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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