

Quality Management Culture and Healthcare Service Quality: The Mediating Role of Reward Systems

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Aim: This study examines the relationship between quality management culture and service quality, focusing on the mediating role of a reward system.

Objective: The issue of healthcare quality has garnered increasing attention from scholars, particularly in low- and middle-income countries, including Taiwan. Effective quality management in healthcare delivery can enhance patient care, improve service quality, and increase patient satisfaction. Consequently, hospital administrators continuously seek management strategies to strengthen employees' ability to provide high-quality care. This study explores the relationship between quality management culture and service quality through reward policy.

Methods: This cross-sectional study utilized a questionnaire survey to collect data from hospitals in central Taiwan. A total of 215 responses were analyzed.

Results: The findings indicate that a strong quality management culture positively influences the implementation of reward policies and employees' perceptions of service quality. Furthermore, the reward policy serves as a mediator in the relationship between quality management culture and employees' perceptions of service quality.

Conclusion: To enhance service quality in healthcare settings, hospital administrators should cultivate a robust quality management culture and implement effective reward policies to motivate employees.

BACKGROUND

The rapid and unexpected emergence of the COVID-19 pandemic caused severe disruptions in global healthcare systems, significantly reducing the overall quality of care¹. In response, hospital managers have increasingly focused on healthcare quality management to mitigate the pandemic's impact on healthcare facilities. One of the most pressing challenges during the pandemic has been maintaining adequate patient care despite limited healthcare workforces, increased healthcare staff workloads, and

heightened job-related stress in Taiwan. Given these challenges, hospital administrators must explore effective management strategies that enhance healthcare staff's ability to provide high-quality care while sustaining their morale and job satisfaction.

Quality Management Culture and Service Quality

Organizational culture plays a crucial role in shaping employees' perceptions of service quality

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(SQ)². A quality management culture (QMC), a subset of organizational culture, emphasizes continuous improvement in healthcare quality. Research indicates that healthcare organizations with a strong QMC tend to achieve better clinical outcomes than those lacking such a culture³. Prioritizing both QMC and SQ, particularly by fostering a patient safety culture, has been shown to lead to significant improvements in hospital management⁴. Additionally, a well-developed QMC strengthens competencies related to process and quality improvement⁵. Despite these findings, research on the relationship between QMC and SQ remains limited, particularly in developing countries^{5,6}. Organizational culture consists of shared beliefs and values that shape employees' attitudes and behaviors. A QMC reflects the collective commitment of an organization's employees to quality improvement efforts⁸. Establishing a strong QMC in hospitals can enhance healthcare professionals' dedication to service quality⁶. Since healthcare providers play a pivotal role in delivering patient care, their service behaviors and attitudes directly influence healthcare value creation⁹. From a hospital management perspective, improving the healthcare staff's service attitudes and behaviors is essential for enhancing SQ and achieving higher patient satisfaction¹⁰.

Human Resource Management and Reward Policy

Hospital managers can utilize human resource management (HRM) strategies to cultivate positive work attitudes among nurses¹¹. One such HRM approach is the reward policy (RP), which has been recognized as an effective mechanism for improving employees' job satisfaction and motivation¹², particularly in service-oriented industries^{13,14}. Research has demonstrated that RP can boost healthcare workforce morale¹⁵ and enhance the quality of care provided to patients¹⁶. Furthermore, since organizational culture influences employees' job behaviors¹⁷, HRM practices such as RP can be instrumental in fostering positive work attitudes and behaviors¹². Integrating RP within a QMC framework may further strengthen the healthcare staff's commitment to service quality.

Research Hypotheses

This study explores whether hospital managers can improve employees' perceptions of SQ by fostering a QMC and implementing HRM practices. Based on existing literature, we propose the following hypotheses: Hypothesis 1: Hospital QMC and RP are positively correlated. Hypothesis 2: RP and employees' perceptions of SQ are positively correlated. Hypothesis 3: Hospital QMC and employees' perceptions of SQ are positively correlated. Hypothesis 4: RP mediates the relationship between QMC and employees' perceptions of SQ. By examining these relationships, this study aims to provide valuable insights into how hospital administrators can enhance service quality through strategic management approaches.

MATERIALS AND METHODS

Research Design and Participants

This cross-sectional study employed a questionnaire survey for data collection. Participants were employees from three teaching hospitals in central Taiwan. The medical quality department staff assisted in distributing the questionnaires to employees who voluntarily agreed to participate. In total, 215 valid responses were collected and analyzed.

Measures

The study utilized three validated scales to measure Quality Management Culture (QMC), Reward Policy (RP), and Service Quality (SQ): QMC Scale: The QMC scale was based on Motwani's¹⁸ definition of quality management and Lapiņa et al.'s⁸ conceptualization of QMC. The scale comprised nine items on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) (Appendix). RP Scale: The RP scale, developed by Tsai and Wu¹¹, included four items measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) (Appendix). SQ Scale: The SQ scale, adapted from Tsai and Tang¹⁰, included 22 items to assess nurses' perceptions of service quality. Responses were recorded on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) (Appendix).

The reliability of the three scales was assessed using Cronbach's alpha (α), yielding values of 0.914 for QMC, 0.879 for RP, and 0.965 for SQ, indicating strong internal consistency.

The validity of the scales was tested using the Bartlett test, which yielded p-values $< .001$ for all three scales. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy exceeded 0.5, confirming suitability for factor analysis. The Bartlett test results ($p < .05$) further supported the validity of the scales¹⁹.

The primary data analysis used Structural Equation Modeling (SEM) with IBM AMOS 22. The measurement model was evaluated based on three criteria for good model fit: (1) Factor loadings above 0.7, (2) Average Variance Extracted (AVE) greater than 0.5, (3) Construct reliability above 0.720. SEM was then used to examine the relationships between latent variables under different measurement models. The model fit was assessed using criteria recommended by Hair

et al.²⁰ Additionally, the Sobel²¹ test and a bias-corrected indirect effect estimate (using 2,000 bootstrap samples) were employed to test mediation effects²². To assess potential common method variance (CMV), Harman's single-factor test was conducted²³. An exploratory factor analysis (EFA) revealed that the first factor explained approximately 35% of the variance, below the 50% threshold, indicating that CMV was not a significant concern in this study. A confirmatory factor analysis (CFA) was also conducted to examine whether a single-factor model adequately explained the data. The results showed that a one-factor model was poorly fit (CFI = 0.595, RMSEA = 0.189). In contrast, the multifactor CFA model demonstrated a much better fit (CFI = 0.923, RMSEA = 0.083). The difference between the two models was statistically significant ($\chi^2(3)$, 95% = 7.814 $<$ 827.631), confirming that CMV did not significantly affect the model estimates (Table 1).

Table 1: compares chi-square difference between two models

MODEL	X2	DF	$\Delta X2$	ΔDF	P-value
SINGLE FACTOR	1152.337	135	827.631	3	<.001
MULTI-FACTOR	324.706	132			

RESULTS

Participants Characteristics

The majority of respondents were women, comprising 80.9% of the sample. Additional demographic details, including age, education level, job position, years of experience, and department, are presented in Table 2.

Reliability and Validity of Measurement Tools

As presented in Table 3, all standardized factor loadings range from 0.645 to 0.876, indicating an acceptable level of item reliability. The composite reliability (CR) of all constructs, ranging from 0.882 to 0.914, exceeds the recommended threshold of 0.724, demonstrating strong internal consistency.

Furthermore, the Average Variance Extracted (AVE) values, ranging from 0.545 to 0.653, surpass the recommended threshold of 0.520²⁵, confirming adequate convergent validity. The questionnaire items are provided in the Appendix.

Table 2: Sample Demographic Distribution

Variables	Classification	No.	%
Gender	Female	174	80.90%
	Male	41	19.1%
Education	College	92	42.8%
	University	109	50.7%
	Master	14	6.5%
Seniority	< 1 year	17	7.9%
	2-3 years	46	21.4%
	4-5 years	25	11.6%
	6-7 years	23	10.7%
	> 8 years	104	48.4%
Age	20-29	71	33.0%
	30-39	80	37.2%
	40-49	62	28.8%
	50-59	2	0.9%
Department	Medicine	21	9.8%
	Medical Technology	24	11.2%
	Nursing	98	45.6%
	Administrative	72	33.5%

Table 3: Results for the measurement model.

Construct	Item	Significance of estimated parameters				Item Reliability		Construct Reliability	Convergence validity
		Unstd.	S.E.	Unstd./S.E.	p-value	Std.	SMC	CR	AVE
Quality Management Culture (QMC)	QMC1	1.000				0.759	0.576	0.914	0.545
	QMC2	1.030	0.084	12.190	0.000	0.799	0.638		
	QMC3	0.993	0.078	12.751	0.000	0.834	0.696		
	QMC4	0.958	0.089	10.736	0.000	0.721	0.520		
	QMC5	0.746	0.079	9.494	0.000	0.645	0.416		
	QMC6	0.774	0.080	9.667	0.000	0.657	0.432		
	QMC7	0.783	0.078	10.059	0.000	0.680	0.462		
	QMC8	1.023	0.086	11.919	0.000	0.797	0.635		
	QMC9	0.877	0.082	10.714	0.000	0.725	0.526		

Reward Policy (RP)	RP1	1.000				0.876	0.767	0.882	0.653
	RP2	1.024	0.06	16.945	0.000	0.870	0.757		
	RP3	0.876	0.063	13.838	0.000	0.802	0.643		
	RP4	0.661	0.063	10.419	0.000	0.668	0.446		
Service Quality (SQ)-Tangible	SQ1	1.000				0.821	0.674	0.882	0.654
	SQ2	1.015	0.096	10.556	0.000	0.675	0.456		
	SQ3	0.994	0.070	14.297	0.000	0.858	0.736		
	SQ4	1.047	0.071	14.821	0.000	0.867	0.752		
Service Quality (SQ)-Reliability	SQ5	1.000				0.850	0.722	0.924	0.708
	SQ6	0.960	0.061	15.793	0.000	0.840	0.706		
	SQ7	1.012	0.068	14.902	0.000	0.821	0.674		
	SQ8	1.095	0.061	17.997	0.000	0.913	0.834		
	SQ9	1.060	0.078	13.548	0.000	0.776	0.602		
Service Quality (SQ)-Response	SQ10	1.000				0.836	0.699	0.900	0.690
	SQ11	1.078	0.067	16.185	0.000	0.866	0.750		
	SQ12	1.023	0.073	14.091	0.000	0.830	0.689		
	SQ13	1.002	0.077	13.027	0.000	0.789	0.623		
Service Quality (SQ)-Assurance	SQ14	1.000				0.907	0.823	0.940	0.797
	SQ15	0.935	0.044	21.465	0.000	0.910	0.828		
	SQ16	0.916	0.046	19.754	0.000	0.883	0.780		
	SQ17	0.881	0.046	18.988	0.000	0.870	0.757		
Service Quality (SQ)-Empathy	SQ18	1.000				0.849	0.721	0.947	0.783
	SQ19	1.025	0.062	16.518	0.000	0.861	0.741		
	SQ20	1.066	0.056	19.065	0.000	0.927	0.859		
	SQ21	1.078	0.064	16.880	0.000	0.876	0.767		
	SQ22	1.051	0.058	18.002	0.000	0.908	0.824		
Service Quality (SQ)	Tangible	1.000				0.744	0.554	0.938	0.751
	Reliability	1.113	0.113	9.877	0.000	0.864	0.746		
	Response	1.189	0.118	10.056	0.000	0.979	0.958		
	Assurance	1.232	0.157	7.870	0.000	0.887	0.787		
	Empathy	1.088	0.155	7.009	0.000	0.850	0.722		

Note: Unstd.: Unstandardized factor loadings; Std: Standardized factor loadings; SMC: Square Multiple Correlations; CR: Composite Reliability; AVE: Average Variance Extracted.

As shown in Table 4, the bold numbers along the diagonal represent the square roots of the AVEs. Since each diagonal value exceeds the

corresponding off-diagonal values, the results confirm satisfactory discriminant validity for all constructs.

Table 4: Discriminant validity for the measurement model

	AVE	QMC	RP	SQ
QMC	0.545	0.738		
RP	0.653	0.567	0.808	
SQ	0.751	0.433	0.469	0.867

Note: The items on the diagonal in bold represent the square roots of the AVE; off-diagonal elements are the correlation estimates.

Table 5 presents the results of the overall model fit, including several model fit indicators and their recommended thresholds based on prior research. Except for χ^2 , all model fit indicators exceed the recommended thresholds suggested by Schumacker and Lomax²⁶. Since χ^2 is highly

sensitive to large sample sizes, researchers often assess model fit using the χ^2/df ratio, where a value below 3 is considered acceptable. The results indicate that most model fit indices meet the recommended criteria, confirming an adequate model fit.

Table 5 : Model fit

Model fit	Criteria	Model fit of the research model
MLχ^2	The small the better	1268.013
DF	The large the better	552.000
Normed Chi-sqr (χ^2/DF)	$1 < \chi^2/\text{df} < 3$	2.297
RMSEA	<0.08	0.078
SRMR	<0.08	0.062
TLI (NNFI)	>0.9	0.882
CFI	>0.9	0.891
GFI	>0.9	0.823
AGFI	>0.9	0.809

Relationship Between QMC, RP, and SQ

Table 6 presents the path coefficient results. The findings indicate that: QMC significantly impacts RP ($\beta = 0.711$, p-value < .001). Both QMC ($\beta = 0.170$, p-value = .005) and RP ($\beta = 0.180$, p-value < .001)

significantly influence SQ. These results confirm the validity of the research model. Specifically, QMC explains 32.1% of the variance in RP, while QMC and RP together account for 26.1% of the variance in SQ. Therefore, Hypotheses 1–3 are supported.

Table 6: Regression coefficient

Dependent Variable	Independent Variable	Unstd	S.E.	Unstd./S.E.	p-value	Std.	R²
RP	QMC	0.711	0.094	7.550	0.000	0.567	0.321
SQ	QMC	0.170	0.060	2.834	0.005	0.247	0.261
	RP	0.180	0.049	3.651	0.000	0.329	

Analysis of Mediation Effects

As shown in Table 7, the total effect of QMC on SQ is statistically significant (p -value $< .05$), with a bias-corrected confidence interval (CI) that does not include zero (CI: [0.192, 0.431]), confirming the presence of a total effect. Similarly, the indirect effect

of QMC on SQ through RP is also statistically significant (p -value $< .05$), with a bias-corrected CI that does not include zero (CI: [0.056, 0.266]). These results support Hypothesis 4, confirming the existence of a mediation effect of RP in the relationship between QMC and SQ.

Table 7: The analysis of indirect effects

Effect	Point Estimate	product of coefficients			Bootstrap 1000 times Bias-corrected 95%	
		S.E.	Z-Value	p-value	Lower bound	Upper bound
Total effect QMC→SQ	0.298	0.062	4.810	0.000	0.192	0.431
Indirect effect QMC→RP→SQ	0.128	0.051	2.510	0.012	0.056	0.266
Direct effect QMC→SQ	0.170	0.070	2.419	0.016	0.034	0.310

DISCUSSION

Successful healthcare requires a strong commitment to quality improvement²⁷. A quality management culture (QMC) enables organizations to gain a competitive advantage in a rapidly evolving healthcare market²⁸. Previous research suggests that a well-established organizational culture significantly influences employees' work attitudes and behaviors⁷. Our findings confirm a positive correlation between QMC and employees' perception of service quality (SQ). By fostering a strong QMC, hospital managers can instill shared beliefs and values regarding quality management, leading to improved service behaviors and ultimately enhancing SQ for patients²⁹. Our results also highlight the role of human resource management practices in strengthening the relationship between quality management culture and service quality. Sun et al.³⁰ found that reward policies (RP) can effectively motivate employees' positive job behaviors. Similarly, Chiang and Birtch³¹ found that employees in the hospitality industry who perceived high service quality standards demonstrated a stronger SQ orientation. Our study extends these findings to healthcare, showing that RP has a significant positive impact

on employees' perception of SQ. Moreover, our research confirms that RP mediates the relationship between QMC and SQ. That is, the influence of QMC on SQ is enhanced when RP is effectively implemented. Based on these findings, we recommend that hospital managers integrate RP into quality management strategies to motivate employees, improve work attitudes, and enhance service quality for patients.

Limitations and Future Research

This study has several limitations. First, the sample was limited to employees from three hospitals in central Taiwan, which may limit the generalizability of the findings. Future research should expand the sample to include more hospitals across different regions to increase external validity. Second, while this study focused on QMC, RP, and SQ, future research could explore the relationship between clinical performance indicators, QMC, and RP. Additionally, reward policy (RP) is only one aspect of human resource management (HRM). Future studies should examine other HRM practices—such as training programs, career development opportunities, and leadership

support—and their influence on nurses' service quality and job satisfaction.

CONCLUSION

Healthcare quality improvement is a long-term process that requires strategic planning and sustained efforts. Effective quality management ensures a win-win outcome for both healthcare staff and patients. From a human resource management perspective, healthcare staff are a hospital's essential human capital and primary healthcare providers. Therefore, aligning hospital employees with organizational quality improvement goals through a strong QMC and effective RP implementation can enhance service quality. Hospital policymakers should leverage RP as a motivational tool to encourage employees to provide better patient care. By integrating quality management principles with structured reward systems, hospitals can create a supportive environment that fosters continuous improvement in healthcare service quality.

Management Implications

During the COVID-19 pandemic, increased patient demand, higher workload, and heightened safety risks contributed to influenced healthcare staff commitment to quality care^{32,33,34,35}. Our study found that QMC, RP, and employees' perceptions of SQ are positively correlated, highlighting actionable insights for hospital managers. To maintain high service quality under challenging conditions, hospital managers should Implement Reward Policies (RP): Appropriately compensate employees for increased workloads, reinforcing morale, motivation, and job satisfaction. Provide Ongoing Education & Training: Strengthen hospital employees' beliefs and values regarding quality management to cultivate a strong QMC. Enhance Organizational Culture: Foster teamwork, accountability, and continuous learning, ensuring that healthcare staff remain committed to delivering high-quality care. By adopting these strategies, hospital managers can support healthcare professionals, improve patient care, and uphold service quality standards in hospitals.

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Conflict of interest

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Ethical statements

Participants provided written informed consent. All responses were anonymous, and respondents and researchers were not acquainted. Privacy and anonymity were maintained because names were not used in the data collection forms. All methods were performed according to the relevant guidelines and regulations.

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