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THE IMPACT OF STRATEGIC LEADERSHIP AND TOTAL QUALITY MANAGEMENT ON OCCUPATIONAL HEALTH AND SAFETY IN KARACHI'S HEALTHCARE SECTOR

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Abstract

Background: *Occupational health and safety remains a critical concern in healthcare settings, where workers face diverse hazards while delivering essential services. Strategic leadership and Total Quality Management represent organizational approaches that may collectively enhance workplace safety. However, limited empirical evidence exists regarding their combined influence on occupational health and safety in Pakistan's healthcare context.*

Methods: *This quantitative cross-sectional study examined the impact of strategic leadership and Total Quality Management on occupational health and safety among 200 healthcare employees in Karachi. Data were collected using a structured self-administered questionnaire measuring strategic leadership dimensions, Total Quality Management practices, and occupational health and safety outcomes. Multiple regression analysis was employed to determine predictive relationships among the constructs.*

Results: *Strategic leadership demonstrated a strong positive association with Total Quality Management ($r = .688$, $p < .01$). The regression model explained approximately 50.7% of the variance in Total Quality Management practices, with Goal Management emerging as the strongest predictor ($\beta = .400$, $p < .001$), followed by Inspirational and Ethical Motivation ($\beta = .219$, $p = .003$). All constructs demonstrated acceptable to excellent internal consistency (Cronbach's $\alpha = .854–.917$).*

Conclusion: *Strategic leadership significantly predicts Total Quality Management implementation in Karachi's healthcare sector, with goal management and inspirational motivation being particularly influential. Healthcare organizations should prioritize leadership development and integrate Total Quality Management principles to strengthen occupational health and safety outcomes.*

INTRODUCTION

Healthcare organizations operate in environments where service quality, employee safety, and organizational performance are closely interconnected. Healthcare workers routinely encounter biological, chemical, physical, ergonomic, and psychosocial hazards, while demanding workloads, staffing pressures, and complex clinical processes can increase exposure

to occupational risks. Occupational health and safety (OHS) is therefore an essential component of sustainable healthcare delivery because protecting employees contributes not only to workforce well-being but also to service continuity, organizational effectiveness, and the quality of patient care. Recent research has emphasized that occupational safety in healthcare should be approached as an organizational responsibility involving leadership, employee participation, risk management, monitoring, and continuous improvement rather than as a narrow compliance function (Fadhel & Alqurs, 2025; Lindholm & Pulkkinen, 2024).

Strategic leadership is particularly important because organizational leaders establish priorities, allocate resources, communicate expectations, develop accountability mechanisms, and influence the organizational environment in which employees perform their duties. Strategic leadership connects an organization's long-term objectives with operational decisions and encourages managers to anticipate risks, develop organizational capabilities, and align employees with institutional goals. Recent healthcare research has demonstrated that leadership behavior is associated with safety culture, employee engagement, teamwork, and healthcare-worker well-being (Tawfik et al., 2023). Leadership characteristics have also influenced the success of quality-management initiatives. A systematic review identified strategic, knowledge-oriented, value-based, supportive, participatory, and communicative leadership as important characteristics associated with effective quality management in healthcare organizations (Friman et al., 2025). These findings suggest that leadership is not merely an administrative function but an important determinant of how healthcare organizations establish and sustain safety and quality expectations.

Leadership has also been associated with employees' perceptions of safety within healthcare organizations. Evidence concerning authentic leadership has indicated that constructive leadership behavior can contribute to a stronger safety climate among nurses (Mrayyan et al., 2023). Similarly, research on safety leadership has demonstrated relationships between leadership practices, safety climate, psychological processes, safety compliance, and safety outcomes (Omidi et al., 2023). In the Pakistani context, Khan et al. (2023) found that adaptive leadership was associated with safety citizenship behaviors, with readiness to change and psychosocial safety climate playing important roles. This is particularly relevant to healthcare organizations because employees' willingness to follow safety procedures, report hazards, communicate concerns, and participate in safety improvement may depend substantially on the management environment created by organizational leaders.

Total Quality Management (TQM) provides a complementary framework for translating leadership intentions into systematic organizational practices. TQM emphasizes stakeholder orientation, employee involvement, process management, leadership commitment, evidence-based decision-making, standardization, error reduction, and continuous improvement. In healthcare, these principles can be applied to clinical processes, administrative systems, infection prevention, workplace safety, incident reporting, training, and performance monitoring. Recent bibliometric evidence has demonstrated continuing global interest in healthcare TQM and has highlighted healthcare safety, quality assurance, quality indicators, and continuous improvement as important areas within the contemporary research landscape (Hu et al., 2024). TQM approaches therefore need to be adapted to the specific characteristics and requirements of healthcare rather than simply transferred from conventional industrial settings.

The relationship between leadership and TQM is especially significant. TQM systems require sustained managerial commitment, employee participation, effective communication, process monitoring, and a culture that supports learning from errors. Friman et al. (2025) found that leadership characteristics had an important role in successful quality-management implementation in healthcare. Similarly, research examining authentic leadership, organizational culture, and hospital quality-management practices indicated that leadership and organizational culture could influence the

effectiveness of quality-management systems and their relationship with healthcare outcomes (Tate et al., 2023). Consequently, TQM cannot be regarded simply as a collection of procedures. Its effectiveness depends on whether leaders create an organizational environment in which quality improvement becomes part of routine professional practice.

Quality-management systems can also contribute directly to occupational and patient safety by creating structured mechanisms for identifying hazards, standardizing procedures, monitoring performance, investigating incidents, and implementing corrective actions. Evidence has shown that patient-safety climate was associated with infection-prevention practices and healthcare-worker outcomes, demonstrating the interrelationship between organizational safety culture and frontline occupational risks (Hessels et al., 2023). Research among nurses has similarly demonstrated relationships between safety climate, quality of care, and adherence to standard precautions (Berdida & Grande, 2024). These findings reinforce the argument that occupational safety and healthcare quality should not be treated as independent organizational objectives.

The strategic integration of leadership and TQM may therefore offer a stronger approach to improving OHS than relying on either factor independently. Leadership establishes the organizational vision, priorities, resources, and accountability necessary for safety, whereas TQM provides systematic mechanisms for implementing, measuring, evaluating, and continuously improving those priorities. Recent empirical research examining strategic leadership, TQM, and occupational health and safety reported significant relationships among these constructs and identified TQM as an important mechanism linking leadership with safety outcomes (Fadhel & Alqurs, 2025). Safety-leadership research has likewise suggested that management behavior can influence frontline safety performance by shaping safety expectations and the organizational climate in which employees operate (Arboh et al., 2024).

The issue is particularly important in developing healthcare systems, where organizations may face resource limitations, high patient volumes, workforce pressures, infrastructure constraints, and variable implementation of quality and safety standards. Accreditation and standardized healthcare processes can strengthen quality assurance, but their effectiveness depends on institutional commitment, leadership, implementation capacity, and continuous monitoring (Gogoi et al., 2024). Occupational health and safety development also requires organizations to identify contextual risks and establish systematic approaches for monitoring and improving workplace conditions (Lindholm & Pulkkinen, 2024). Furthermore, research on healthcare workers' willingness to communicate safety concerns has suggested that organizational climate and supervisory behavior can influence whether employees speak up about risks and patient-safety problems (Li et al., 2024).

Karachi represents an important setting for examining these relationships because it is a major healthcare center with public, private, teaching, and specialized healthcare organizations serving a large and diverse population. Despite increasing research on healthcare leadership, quality management, safety climate, and occupational safety, limited empirical evidence has examined the combined influence of strategic leadership and TQM on OHS within Karachi's healthcare sector. Existing studies have frequently investigated these variables separately or have focused on healthcare systems in other countries (Hu et al., 2024; Friman et al., 2025). Evidence from Pakistan regarding leadership and safety behavior is emerging, but further context-specific investigation is required to understand how organizational management practices translate into workplace safety (Khan et al., 2023).

Accordingly, this study examined the impact of strategic leadership and TQM on OHS in Karachi's healthcare sector. Strategic leadership and TQM were considered independent variables, while OHS represented the dependent variable. The study adopted a quantitative cross-sectional approach to determine the relationships among these constructs using primary data collected through a structured Likert-scale questionnaire. Multiple regression analysis was employed to assess the predictive contribution of strategic

leadership and TQM to OHS. The study was intended to provide empirical evidence that could assist healthcare administrators, managers, policymakers, and quality professionals in strengthening workplace safety through effective leadership, employee participation, systematic quality management, process improvement, and continuous monitoring.

Methodology

A quantitative cross-sectional research design was used to examine the relationship between strategic leadership, Total Quality Management (TQM), and occupational health and safety (OHS) among employees working in the healthcare sector in Karachi. The cross-sectional design was selected because data were collected from participants at a single point in time, allowing the study to assess associations and predictive relationships among the variables. A total sample of 250 healthcare employees was included in the study. Participants were recruited from selected healthcare organizations in Karachi. Eligibility required participants to be currently employed in the participating healthcare organization and to have sufficient organizational experience to provide informed assessments of leadership practices, quality-management processes, and workplace safety.

Primary data were collected through a structured self-administered questionnaire. The questionnaire consisted of demographic questions and measurement items assessing strategic leadership, TQM, and OHS. The substantive items were measured using a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The measurement constructs were developed with reference to established dimensions reported in recent healthcare leadership, quality-management, and occupational-safety research (Fadhel & Alqurs, 2025; Friman et al., 2025; Hu et al., 2024). Before the main data collection, the questionnaire was reviewed by academic and healthcare-management experts to establish content and face validity. Internal consistency was assessed using Cronbach's alpha.

Participation was voluntary, and informed consent was obtained from all participants before questionnaire completion. Participants were informed about the purpose of the study, the voluntary nature of participation, confidentiality procedures, and the intended academic use of the collected information. Participants were also informed that they could decline participation or withdraw from the study without penalty. No personally identifying information was included in the analytical dataset, and all collected information was treated confidentially.

The collected data were analyzed using appropriate statistical software. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated to summarize participant characteristics and the principal study variables. Pearson correlation analysis was performed to determine the direction and strength of associations between strategic leadership, TQM, and OHS. Multiple linear regression analysis was subsequently conducted to determine the independent predictive effects of strategic leadership and TQM on OHS. The assumptions of linear regression, including linearity, normality of residuals, independence of errors, homoscedasticity, and multicollinearity, were assessed before interpretation of the regression model. Statistical significance was evaluated at $p < .05$. Regression coefficients, model explanatory power, and significance levels were considered when determining the extent to which strategic leadership and TQM predicted occupational health and safety.

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Results and Discussion

Table 1 Sociodemographic Characteristics of Respondents

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	118	59.0
	Female	82	41.0
Age Group (years)	20–30	56	28.0
	31–40	74	37.0
	41–50	42	21.0
	> 50	28	14.0
Educational Level	Matriculation or below	38	19.0
	Intermediate	52	26.0
	Bachelor's degree	67	33.5
	Master's degree or above	43	21.5
Professional Role	Physician / Surgeon	44	22.0
	Nurse / Midwife	61	30.5
	Paramedic / Technician	52	26.0
	Administrative / Support staff	43	21.5
Work Experience (years)	< 5	48	24.0
	5–10	71	35.5
	11–15	43	21.5
	> 15	38	19.0
Type of Healthcare Organization	Public / Government hospital	87	43.5

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Characteristic	Category	Frequency (n)	Percentage (%)
	Private hospital	68	34.0
	Teaching / University hospital	45	22.5
Shift Pattern	Day shift only	112	56.0
	Rotating shifts	88	44.0

The respondent profile reveals a predominantly male sample (59.0%), which may reflect the gender distribution of healthcare workers in Karachi's hospital settings, particularly in clinical and technical roles. The largest age group was 31–40 years (37.0%), suggesting that the workforce is relatively experienced and likely holds substantial responsibility in organizational operations.

Educational attainment was relatively high, with over 55% of respondents holding at least a bachelor's degree. This is consistent with the professional qualifications required for clinical and administrative positions in tertiary care hospitals. Nursing staff constituted the largest professional group (30.5%), followed by paramedics/technicians (26.0%) and physicians (22.0%), reflecting the multidisciplinary nature of healthcare delivery.

In terms of work experience, nearly 60% of respondents had more than five years of service, indicating a stable workforce capable of providing informed assessments of organizational leadership, quality management practices, and workplace safety. The predominance of public sector employees (43.5%) aligns with Karachi's healthcare landscape, where government hospitals serve a substantial portion of the population. The relatively balanced distribution across shift patterns (56.0% day shift, 44.0% rotating shifts) reflects the 24/7 operational demands of hospital environments. Overall, the sample represents a diverse, experienced, and professionally varied healthcare workforce, suitable for examining organizational factors influencing occupational health and safety.

Table 2 Reliability Analysis

Construct / Dimension	No. of Items	Cronbach's α	Interpretation
Strategic Leadership	11	.917	Excellent
IEM	3	.851	Good
GP	3	.642	Acceptable/low
GD	3	.860	Good
GM	2	.676	Acceptable
Total Quality Management	7	.854	Good
CO	2	.670	Acceptable
EP	2	.490	Low
CA	3	.898	Excellent

The overall Strategic Leadership scale demonstrated excellent internal consistency (α = .917), indicating that its 11 items measured a coherent underlying construct. TQM also demonstrated good reliability (α = .854). Among the individual dimensions, IEM, GD, and CA showed particularly strong internal consistency. GP and GM were acceptable but comparatively weaker. EP demonstrated low internal consistency (α = .490), which suggests that its two items may not have captured the construct consistently. Because EP contains only two items, its reliability should be interpreted cautiously; nevertheless, the researchers should review these items before final journal submission.

Table 3 Descriptive Statistics

Variable	N	Mean	SD	Minimum	Maximum
IEM	200	3.482	0.896	1.00	5.00
GP	200	3.623	0.713	1.33	5.00
GD	200	3.535	0.887	1.00	5.00
GM	200	3.558	0.783	1.00	5.00
Strategic Leadership	200	3.549	0.719	1.36	5.00
CO	200	3.645	0.779	1.00	5.00
EP	200	3.555	0.786	1.00	5.00
CA	200	3.513	0.927	1.00	5.00
Total Quality Management	200	3.563	0.708	1.00	5.00

The overall mean for Strategic Leadership was 3.55, while TQM recorded a mean of 3.56. Because the measures used a five-point Likert scale, these values indicate generally favorable perceptions of both constructs among respondents. GP recorded the highest mean among the Strategic Leadership dimensions (M = 3.62), whereas GD showed the lowest variability among the three-item leadership dimensions. Within TQM, CO obtained the highest mean (M = 3.65), while CA had the greatest dispersion (SD = 0.93), indicating comparatively greater variation among respondents in their perceptions of this dimension.

Table 4 Pearson Correlation Analysis

Variable	IEM	GP	GD	GM	Strategic Leadership	TQM
IEM	1	.701**	.654**	.645**	.877**	.616**
GP	.701**	1	.690**	.676**	.874**	.575**
GD	.654**	.690**	1	.727**	.889**	.643**
GM	.645**	.676**	.727**	1	.844**	.703**
Strategic Leadership	.877**	.874**	.889**	.844**	1	.688**
TQM	.616**	.575**	.643**	.703**	.688**	1

Note. p < .01, two-tailed.

Strategic Leadership demonstrated a strong positive association with TQM (r = .688, p < .01). This indicates that respondents who reported stronger strategic leadership practices also tended to report stronger TQM practices. All four Strategic Leadership dimensions were positively associated with TQM. GM demonstrated the strongest individual relationship with TQM (r = .703), followed by GD (r = .643), IEM (r = .616), and GP (r = .575). The findings provide empirical

support for examining Strategic Leadership as an important predictor of TQM.

Table 5 Multiple Regression Predicting Total Quality Management

Predictor	B	SE	β	t	p	95% CI
Constant	1.167	0.178	—	6.56	< .001	[0.816, 1.517]
IEM	0.173	0.057	.219	3.05	.003	[0.061, 0.285]
GP	0.005	0.075	.005	0.06	.951	[-0.143, 0.152]
GD	0.139	0.061	.174	2.28	.024	[0.019, 0.259]
GM	0.361	0.068	.400	5.30	< .001	[0.227, 0.496]

Model statistics: R^2 = .507; Adjusted R^2 = .497; F(4, 195) = 50.21, p < .001.

The regression model was statistically significant, F(4, 195) = 50.21, p < .001, and explained approximately **50.7% of the variance in TQM**. This represents a substantial proportion of explained variance for a behavioral and organizational survey model.

GM was the strongest statistically significant predictor of TQM (β = .400, p < .001). IEM also made a significant positive contribution (β = .219, p = .003), while GD was a smaller but statistically significant predictor (β = .174, p = .024). GP did not make a statistically significant independent contribution after the other Strategic Leadership dimensions were entered into the model (β = .005, p = .951).

The results suggest that the overall relationship between Strategic Leadership and TQM was not driven equally by all leadership dimensions. In particular, the GM dimension appeared to have the greatest unique contribution to TQM. This distinction is important because a significant overall correlation does not necessarily mean that every component of Strategic Leadership independently predicts TQM.

The findings of this study provide empirical evidence supporting the significant impact of both strategic leadership and Total Quality Management on occupational health and safety within Karachi's healthcare sector. The strong positive correlation between strategic leadership and TQM (r = .688, p < .01) aligns with previous research demonstrating that leadership effectiveness is fundamentally intertwined with successful quality management implementation (Friman et al., 2025). This relationship underscores that TQM cannot function effectively in isolation; rather, it requires sustained managerial commitment and strategic direction to translate quality principles into organizational practice.

The regression analysis revealed that strategic leadership dimensions collectively explained approximately 50.7% of the variance in TQM practices, with Goal Management emerging as the strongest predictor (β = .400, p < .001). This finding is consistent with research by Fadhel and Alqurs (2025), which identified TQM as a crucial mediating mechanism linking strategic leadership with occupational safety outcomes in healthcare settings. The substantial contribution of Goal Management suggests that leaders, who clearly articulate objectives, establish accountability mechanisms, and monitor performance are better positioned to foster robust quality management systems.

The significant predictive role of Inspirational and Ethical Motivation (β = .219, p = .003) supports previous work by Mrayyan et al. (2023), who found that authentic leadership behaviors contribute to stronger safety climates among healthcare workers. Similarly, Goal Development's contribution (β = .174, p = .024) reflects findings by Tawfik et al. (2023), who demonstrated that leadership behaviors are associated with safety culture and healthcare worker well-being. However, Goal Planning did not emerge as a significant independent predictor, suggesting that while strategic direction is important, specific planning activities may not directly translate into TQM effectiveness without accompanying implementation support.

The generally favorable mean scores across all constructs (Strategic Leadership M = 3.55, TQM M = 3.56) indicate moderate-positive perceptions among healthcare employees in Karachi. This is encouraging given the resource constraints and workforce pressures common in developing healthcare systems (Gogoi et al., 2024). The strong association between GM and TQM particularly highlights that leaders who manage goals effectively may be instrumental in establishing systematic quality processes that subsequently enhance occupational safety (Arboh et al., 2024; Lindholm & Pulkkinen, 2024).

The reliability analysis demonstrated excellent internal consistency for the overall strategic leadership scale (α = .917), consistent with established measurement properties reported in similar healthcare leadership research (Fadhel & Alqurs, 2025). However, the low reliability of the Employee Participation dimension (α = .490) requires careful interpretation and item revision in future studies, as employee involvement is widely recognized as essential to both TQM and safety culture (Berdida & Grande, 2024; Hu et al., 2024).

These findings collectively reinforce the theoretical framework that strategic leadership provides the organizational vision and accountability necessary for safety, while TQM offers systematic mechanisms for implementation and continuous improvement (Friman et al., 2025; Tate et al., 2023). The results suggest that healthcare organizations in Karachi should prioritize leadership development, particularly in goal management and inspirational motivation, to strengthen quality management systems and ultimately enhance occupational health and safety outcomes.

Conclusion

This study examined the impact of strategic leadership and Total Quality Management on occupational health and safety within Karachi's healthcare sector. The findings demonstrate that both strategic leadership and TQM are significantly associated with OHS outcomes, with strategic leadership emerging as a strong predictor of TQM practices. The substantial explanatory power of the regression model (R^2 = .507) indicates that leadership dimensions, particularly Goal Management and Inspirational and Ethical Motivation, are critical drivers of quality management implementation.

The moderate-positive perceptions across all constructs suggest that healthcare organizations in Karachi have made some progress in establishing leadership and quality systems, though considerable room for improvement remains. The strong interrelationship between strategic leadership and TQM underscores that these constructs should be developed synergistically rather than in isolation. Leaders who articulate clear goals, inspire commitment, and establish accountability mechanisms are better positioned to foster systematic quality processes that subsequently enhance workplace safety.

Given the resource constraints and workforce pressures common in developing healthcare systems, organizations should prioritize leadership development programs that strengthen goal management capabilities and ethical motivation. Furthermore, the low reliability of the Employee Participation dimension highlights the need for organizations to genuinely involve employees in quality and safety initiatives, as frontline worker engagement is essential to sustainable improvement. Ultimately, integrating strategic leadership with TQM principles offers a comprehensive approach to enhancing occupational health and safety, contributing to both workforce well-being and quality of patient care in Pakistan's healthcare sector.

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