Natural Resources for Human Health
eISSN: 2583-1194

Original Research

Received 20 May 2026
Revised 29 June 2026
Accepted 24 July 2026

Natural Resources for Human Health 2026, Vol. 6 (10s): 515–521

KEYWORDS:
leadership; healthcare workers; patient safety; communication; hospital administration.

Safety Performance as a Mechanism Linking Leadership and Work Facilities to Healthcare Workers' Performance: The Moderating Role of Communication Transparency

Ikhsan Dwianto[1]*, Usman Rianse[2], Patwayati[3], Asnia Zainuddin[4]

[1]Doctoral Program in Management Science, Postgraduate Program, Halu Oleo University, Indonesia

ABSTRACT:

Objective: To examine the direct effects of leadership and work facilities on healthcare workers' performance, the mediating roles of safety awareness and safety performance, and the moderating role of communication transparency in a resource-constrained regional hospital.

Methods: A sequential explanatory mixed-method design was applied at Dr. L.M. Baharuddin Regional General Hospital, Muna Regency, Indonesia. The quantitative phase involved 144 respondents drawn from a population of 225 healthcare workers. Data were collected using Likert-scale questionnaires and analyzed with partial least squares structural equation modeling. Qualitative information from selected participants was used to contextualize the quantitative findings.

Results: Leadership significantly predicted safety performance (β=0.294; p=0.019) but not safety awareness or healthcare workers' performance. Facilities significantly predicted safety awareness (β=0.823; p<0.001), safety performance (β=0.593; p<0.001), and healthcare workers' performance (β=-0.277; p=0.048). Safety awareness (β=0.223; p=0.041) and safety performance (β=0.418; p=0.001) predicted performance. Safety performance mediated the facilities-performance relationship (β=0.248; p=0.001). Communication transparency moderated the effects of leadership, facilities, and safety performance on healthcare workers' performance.

Conclusion: Healthcare workers' performance is shaped by the interaction of organizational resources, safety behavior, and transparent communication. Strengthening facilities and safety performance while maintaining open communication may improve performance in resource-constrained hospitals.

INTRODUCTION

Healthcare workers' performance is central to the quality and continuity of hospital services because clinical and non-clinical processes depend on accurate, consistent, and safe work behavior. Hospitals are high-risk organizations in which performance cannot be separated from adherence to procedures, responsiveness to risk, and patient safety. Leadership is therefore relevant because leaders clarify goals, coordinate work, remove obstacles, and reinforce expected standards, while organizational resources determine whether staff can translate those expectations into reliable practice.[1,2]. Regional hospitals in resource-constrained settings face a particularly difficult combination of high service demand, limited facilities, staffing pressures, and hierarchical communication. In the study setting, the 2024 bed occupancy rate was 83.9%, average length of stay was 5.8 days,

and turnover interval was 3.75 days. These operational indicators suggest substantial service pressure. In such conditions, inadequate facilities may increase physical and psychological workload, whereas appropriate infrastructure can support efficiency and reduce procedural risk.[3,4] This situation demonstrates that high service-related pressures must be balanced with adequate organizational support to prevent negative consequences for work performance. Limited facilities can exacerbate job demands, as employees are required to invest more effort, time, and attention into completing tasks while also facing a higher risk of procedural errors. Conversely, the availability of infrastructure suited to job requirements can streamline service processes, reduce operational obstacles, and assist employees in adhering to procedures more consistently. This indicates that the quality of work facilities is a crucial aspect of the organizational environment, influencing employees' ability to manage service pressures while maintaining the effectiveness and safety of their work.

Safety awareness and safety performance provide two complementary mechanisms for understanding how organizational conditions translate into employee outcomes. Safety awareness reflects vigilance toward hazards and the perceived importance of safe work, whereas safety performance concerns observable compliance and participation in safe practice. Previous research shows that safety leadership and safety-related behaviors are important for performance in high-risk work, including healthcare.[5,6,7]. Leadership plays a strategic role in this process, as the direction, example, communication, and support provided by leaders shape how employees respond to the various potential hazards encountered at work. In high-risk work environments such as healthcare, this relationship is particularly critical, given that errors or the disregard of safety procedures can have a direct impact on both employees and the quality of patient care. Communication transparency may further determine whether organizational inputs become effective performance. Open communication can clarify expectations, facilitate reporting, reduce uncertainty, and support organizational learning. In hierarchical hospital settings, however, staff may hesitate to raise concerns or disclose errors. Communication and optimal-resolution approaches emphasize the importance of openness when organizations respond to safety events.[8,9]

The present study addresses an important gap in the integrated examination of leadership, facilities, safety awareness, safety performance, communication transparency, and healthcare workers' performance within the context of a regional hospital. Previous studies have generally examined these organizational and safety-related factors separately, leaving limited understanding of how they interact simultaneously to shape employee performance, particularly in healthcare organizations operating under resource constraints and high service demands. Rather than treating patient safety merely as a clinical outcome, the proposed model conceptualizes safety as an organizational and behavioral mechanism through which leadership and workplace conditions can be translated into improved employee outcomes. Accordingly, the study examines the direct relationships among the proposed constructs while also investigating safety awareness and safety performance as mediating mechanisms that explain how organizational conditions contribute to healthcare workers' performance. Furthermore, communication transparency is incorporated as a moderating factor to determine whether open, clear, and accessible organizational communication strengthens the proposed relationships. By integrating organizational resources, leadership, safety mechanisms, and communication processes within a single analytical framework, this study provides a more comprehensive explanation of healthcare workers' performance. This integrated approach is expected to extend management-oriented explanations of performance beyond predominantly clinical perspectives and provide a stronger understanding of how regional hospitals can optimize employee performance while maintaining safe work practices despite limitations in organizational resources, facilities, and operational capacity.

THEORETICAL FOUNDATION

Path-Goal Leadership Theory.This theory explains leadership effectiveness as the ability of leaders to clarify the route toward valued goals, reduce work-related obstacles, and provide the type of support required by followers and task conditions. The four behavioral patterns commonly associated with the theory—directive, supportive, participative, and achievement-oriented leadership—are particularly relevant to hospitals because clinical work requires both procedural clarity and adaptive support. In a resource-constrained hospital, leaders can improve safety-related performance by clarifying standards, coordinating interdependent tasks, involving staff in problem solving, and removing barriers that prevent safe task completion.[16-20]

Organizational Support Theory. Organizational Support Theory proposes that employees develop a general belief about the extent to which the organization values their contribution and cares about their well-being. In healthcare settings, support is communicated not only through interpersonal treatment but also through tangible resources, training, staffing support, and access to facilities that enable safe work. From this perspective, work facilities represent a material signal of organizational

support. When healthcare workers perceive that the organization provides adequate resources and protects their well-being, they are more likely to reciprocate through stronger commitment, safer work behavior, and improved performance.[21-23]

High Reliability Organization Theory. High Reliability Organization theory is relevant to hospitals because it focuses on how organizations operating under complex and hazardous conditions sustain dependable performance and prevent catastrophic failure. High-reliability systems emphasize continuous attention to possible failure, sensitivity to frontline operations, rapid learning from small errors, resilience, and the use of expertise in decision making. Safety awareness and safety performance can therefore be viewed as behavioral manifestations of organizational reliability: awareness enables early recognition of hazards, whereas safety performance converts that recognition into consistent compliance, participation, reporting, and corrective action.[24-26]

Communication Transparency as a Contextual Mechanism. Transparent communication complements the three theoretical perspectives by reducing ambiguity and enabling timely coordination. Open, timely, and credible communication supports trust, encourages employees to speak up, facilitates interdisciplinary collaboration, and makes limitations in resources or procedures visible before they become safety failures. In the present model, communication transparency is treated as a boundary condition because the effects of leadership, facilities, and safety behavior may become stronger or weaker depending on whether information is openly shared and acted upon.[27-29]

Integration of the Theories. Taken together, Path-Goal Leadership Theory, Organizational Support Theory, and High Reliability Organization Theory provide a multilevel explanation of healthcare workers' performance. Leadership clarifies goals and removes obstacles; organizational support is expressed through the resources and facilities that enable employees to work safely; and high-reliability principles explain how safety awareness and safety performance convert these organizational inputs into dependable behavior. Communication transparency determines the quality of information flow across these mechanisms. This integration supports the study's mediation and moderation model and is consistent with contemporary evidence that safety performance in healthcare is shaped by organizational, behavioral, and communication-related determinants.[30]

METHODS

Study design and setting. This study used a mixed-method sequential explanatory design. Quantitative analysis was conducted first, followed by qualitative inquiry to deepen interpretation of the statistical findings. The study was conducted at Dr. L.M. Baharuddin Regional General Hospital, Muna Regency, Southeast Sulawesi, Indonesia, a type-C regional referral hospital operating under resource constraints.

Population and sample. The quantitative population comprised 225 healthcare workers and the final sample included 144 respondents. The dissertation used cluster-based distribution by profession for the quantitative sample. Selected respondents with relevant experience and knowledge were subsequently approached purposively for the qualitative phase.

Measures and data collection. Quantitative data were obtained using a structured questionnaire with a five-point Likert scale (1=strongly disagree to 5=strongly agree). The instrument measured leadership, work facilities, safety awareness, safety performance, communication transparency, and healthcare workers' performance. Surveys were distributed in paper-based and electronic formats. Qualitative information was collected using semi-structured questions designed to explore the reasons behind quantitative responses. Supporting hospital documents, including safety procedures and accreditation-related materials, were also considered in contextual interpretation.

Data analysis. Partial least squares structural equation modeling was performed using SmartPLS. Convergent validity was evaluated using indicator loadings and average variance extracted, while construct reliability was evaluated using Cronbach's alpha and composite reliability. The structural model was assessed using R^2 and standardized root mean square residual. Hypotheses were tested through bootstrapping using $t>1.96$ and $p<0.05$ as significance criteria. Mediation was evaluated using specific indirect effects and moderation using interaction effects.[10]

RESULTS

Measurement and structural model. All constructs showed high internal consistency. Cronbach's alpha ranged from 0.955 to 0.970, composite reliability from 0.961 to 0.972, and average variance extracted from 0.554 to 0.715. R^2 was 0.776 for safety awareness, 0.760 for safety performance, and 0.958 for healthcare workers' performance. The estimated-model SRMR was 0.096, meeting the study criterion of <0.10.

Table 1. Direct effects in the structural model

H	Relationship	β	t	p	Decision
H1	Leadership → Safety awareness	0.063	0.513	0.608	Not supported
H2	Leadership → Safety performance	0.294	2.349	0.019	Supported
H3	Leadership → Healthcare workers' performance	0.089	1.125	0.261	Not supported
H4	Facilities → Safety awareness	0.823	6.014	<0.001	Supported
H5	Facilities → Safety performance	0.593	4.504	<0.001	Supported
H6	Facilities → Healthcare workers' performance	-0.277	1.979	0.048	Supported
H7	Safety awareness → Healthcare workers' performance	0.223	2.045	0.041	Supported
H8	Safety performance → Healthcare workers' performance	0.418	3.313	0.001	Supported

Source: Primary data processed, 2026.

The direct-effect results indicate that facilities were the strongest predictor of safety awareness and also had a substantial positive association with safety performance. Leadership predicted safety performance but did not directly predict safety awareness or healthcare workers' performance. Both safety awareness and safety performance were positively associated with healthcare workers' performance. The negative coefficient for the direct facilities-performance path should be interpreted in the context of the simultaneous model and indirect pathway through safety performance.

Table 2. Mediation effects

H	Indirect pathway	β	t	p	Decision
H9	Leadership → Safety awareness → Performance	0.014	0.381	0.703	No mediation
H10	Facilities → Safety performance → Performance	0.248	3.220	0.001	Mediation

Source: Primary data processed, 2026.

Safety awareness did not mediate the relationship between leadership and healthcare workers' performance. In contrast, safety performance significantly mediated the effect of facilities on performance, indicating that the contribution of facilities is partly transmitted through safer work behavior.

Table 3. Moderating effects of communication transparency

H	Interaction	β	t	p	Decision
H11	Transparency × Leadership → Performance	0.178	2.217	0.027	Moderates
H12	Transparency × Facilities → Performance	-0.890	3.346	0.001	Moderates
H13	Transparency × Safety awareness → Performance	-0.015	0.074	0.941	Does not moderate
H14	Transparency × Safety performance → Performance	0.773	4.639	<0.001	Moderates

Source: Primary data processed, 2026.

Communication transparency significantly moderated the leadership-performance, facilities-performance, and safety performance-performance relationships, but did not moderate the safety awareness-performance relationship. The strongest interaction was observed for safety performance, suggesting that open communication amplifies the performance contribution of safe work behavior. The negative facilities interaction indicates that the conditional effect of facilities changes as communication transparency increases and should not be interpreted as a simple beneficial main effect.

DISCUSSION

Leadership was significantly related to safety performance but not directly to healthcare workers' performance or safety awareness. This pattern suggests that leadership in the study setting may operate more effectively through concrete safety practices than through general perceptions or direct performance effects. Leadership research in nursing similarly links leadership style with organizational commitment, care quality, and staff outcomes, supporting the importance of leaders in shaping the context in which safe performance occurs.[1,2,11]

Facilities showed strong positive effects on safety awareness and safety performance, while their direct coefficient for overall performance was negative after simultaneous adjustment for other variables. The mediation result helps explain this pattern: facilities contributed positively to performance through safety performance. Adequate equipment and working conditions can reduce operational barriers, but resources generate value only when translated into consistent safe practice. This interpretation is compatible with evidence linking work environments and occupational exposures with healthcare-worker wellbeing and performance.[3,4]

Safety awareness and safety performance each predicted healthcare workers' performance, but only safety performance served as a significant mediator in the tested indirect pathways. This distinction is important. Awareness represents recognition and vigilance, whereas performance reflects enacted behavior. In high-risk settings, organizational outcomes depend not only on knowing what is safe but on consistently performing required safety behaviors. Research on proactive and prosocial safety behavior likewise emphasizes the behavioral dimension of safety performance.[6,7]

Communication transparency emerged as an important boundary condition. It strengthened the leadership-performance and safety performance-performance relationships and significantly altered the facilities-performance relationship. Open communication may make expectations clearer, facilitate reporting, and allow staff to adjust work practices when resources are constrained. Communication-and-resolution models and research on perceived transparency support the broader proposition that openness can influence trust and organizational responses.[8,9,12]

The model explained 95.8% of the variance in healthcare workers' performance, indicating very high in-sample explanatory power. This result should nevertheless be interpreted cautiously because the study was conducted in one regional hospital and relied substantially on self-reported cross-sectional survey data. The sequential explanatory component adds contextual depth, but it does not remove the limitations of cross-sectional causal inference. Future studies should use longitudinal and multi-hospital designs and consider safety culture, workload, job satisfaction, stress, and burnout as additional explanatory variables.[13,14]

CONCLUSION

Healthcare workers' performance at Dr. L.M. Baharuddin Regional General Hospital is best understood as the result of interacting organizational resources, safety behavior, and communication conditions. Leadership contributes primarily through safety performance rather than through a direct performance pathway. Facilities strongly support safety awareness and safety performance, and safety performance mediates the relationship between facilities and overall performance. Communication transparency is a meaningful contextual factor because it moderates the effects of leadership, facilities, and safety performance. Hospital managers should therefore combine resource improvement with reliable safety systems and open communication rather than treating these interventions separately.

ACKNOWLEDGEMENTS

The authors thank the management and healthcare workers of Dr. L.M. Baharuddin Regional General Hospital, Muna Regency, for their support and participation in the study.

AUTHOR CONTRIBUTIONS

Ikhsan Dwianto: conceptualization, investigation, data collection, formal analysis, and original draft preparation. Usman Rianse: supervision, conceptual guidance, and critical review. Patwayati: supervision, methodology review, and critical revision. Asnia Zainuddin: supervision, health-management contextualization, and critical revision. All authors reviewed and approved the final manuscript.

REFERENCES

[1] Al-Yami, M., Galdas, P., & Watson, R. (2018). Leadership Style and Organisational Commitment Among Nursing Staff in Saudi Arabia. Journal of Nursing Management, 26(5), 531–539. https://doi.org/10.1111/jonm.12578.

[2] Alanazi, N. H., Alshamlani, Y., & Baker, O. G. (2022). The Association Between Nurse Managers' Transformational Leadership and Quality of Patient Care: A Systematic Review. International Nursing Review, 70(2), 175–184. https://doi.org/10.1111/inr.12819

[3] Algunmeeyn, A., El-Dahiyat, F., Altakhineh, M. M., Azab, M., & Babar, Z. (2020). Understanding the Factors Influencing Healthcare Providers' Burnout During the Outbreak of COVID-19 in Jordanian Hospitals. Journal of Pharmaceutical Policy and Practice, 13(1). https://doi.org/10.1186/s40545-020-00262-y

[4] Deniz, H., & Saraç, E. T. (2023). Noise Exposure in Healthcare Workers. Medicine Science International Medical https://doi.org/10.5455/medscience.2023.08.127

[5] Arboh, F., Dai, B., Quansah, P. E., Atingabilli, S., Drokow, E. K., & Addai-Dansoh, S. (2024). Safety first, but how? Examining the impact of safety leadership in frontline healthcare workers' safety performance during health crisis. Journal of Contingencies and Crisis Management, 32(3). https://doi.org/10.1111/1468 5973.12608

[6] Curcuruto, M., Conchie, S. M., Mariani, M. G., & Violante, F. S. (2015). The Role of Prosocial and Proactive Safety Behaviors in Predicting Safety Performance. Safety Science, 80, 317–323. https://doi.org/10.1016/j.ssci.2015.07.032

[7] Atikasari, C. D., Sudiarno, A., & Priyanto, E. (2022). The Effect of Safety Leadership, Safety Culture, and Safety Behavior on Safety Performance After a Company Merger: A Case Study. Jurnal Sistem Dan Manajemen Industri, 6(2), 187–199. https://doi.org/10.30656/jsmi.v6i2.5051

[8] Dossett, L. A., Miller, J., Jagsi, R., Sales, A., Fetters, M. D., Boothman, R. C., & Dimick, J. B. (2019). A Modified Communication and Optimal Resolution Program for Intersystem Medical Error Discovery: Protocol for an Implementation Study. Jmir Research Protocols, 8(7), e13396. https://doi.org/10.2196/13396

[9] Boothman, R. C. (2016). CANDOR: The Antidote to Deny and Defend? Health Services Research, 51(S3), 2487–2490. https://doi.org/10.1111/1475 6773.12626

[10] Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modeling. In *Handbook of market research* (pp. 587-632). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-57413-4_15

[11] Alloubani, A., Akhu-Zaheya, L., Abdelhafiz, I. M., & Almatari, M. (2019). Leadership Styles' Influence on the Quality of Nursing Care. International Journal of Health Care Quality Assurance, 32(6), 1022–1033. https://doi.org/10.1108/ijhcqa-06 2018-0138

[12] Abitbol, A., Lee, N., & VanDyke, M. S. (2022). Examining the Perceived Transparency of DTC Genetic Testing Company Communication and Its Impact on Consumer Trust, Attitude and Behavioral Intentions. Journal of Communication Management, 26(3), 315–330. https://doi.org/10.1108/jcom-01-2022-0006

[13] Chatzittofis, A., Constantinidou, A., Artemiadis, A., Michailidou, K., & Karanikola, M. (2021). The Role of Perceived Organizational Support in Mental Health of Healthcare Workers During the COVID-19 Pandemic: A Cross-Sectional Study. Frontiers in Psychiatry, 12. https://doi.org/10.3389/fpsyt.2021.707293

[14] Carvalho, R. E. F. L. de, Bates, D. W., Syrowatka, A., Almeida, Í. L. S. de, Sousa, L. S. d., Goncalves, J., Oliveira, N., Gama, M., & Alencar, A. P. A. (2023). Factors Determining Safety Culture in Hospitals: A Scoping Review. BMJ Open Quality, 12(4), e002310. https://doi.org/10.1136/bmjoq-2023-002310

[15] Carayon, P., Xie, A., & Kianfar, S. (2013). Human Factors and Ergonomics as a Patient Safety Practice. BMJ Quality & Safety, 23(3), 196–205. https://doi.org/10.1136/bmjqs-2013-001812

[16] Abdulrasheed, O., Mohamad, M., & Aboudahr, S. M. F. M. (2019). Path-Goal Theory and the Application in Educational Management and Leadership. Education Quarterly Reviews, 2(2). https://doi.org/10.31014/aior.1993.02.02.77

[17] Alanazi, T. R., Khalaf, B., & Rasli, A. (2013). Overview of Path-Goal Leadership Theory. Jurnal Teknologi, 64(2). https://doi.org/10.11113/jt.v64.2235

[18] Phillips, A. S., & Phillips, C. R. (2016). Behavioral Styles of Path-Goal Theory. Management Teaching Review, https://doi.org/10.1177/2379298116639725

[19] Perez, J. M. (2021). Leadership in Healthcare: Transitioning From Clinical Professional to Healthcare Leader. Journal of Healthcare Management, 66(4), 280–302. https://doi.org/10.1097/jhm-d-20-00057

[20] Rahman, B. (2022). Principal's Leadership Style Based on Path-Goal Theory: A Literature Review. International Journal of Current Science Research and Review, 05(06). https://doi.org/10.47191/ijcsrr/v5-i6-16

[21] Kim, K. Y., Eisenberger, R., & Baik, K. (2016). Perceived Organizational Support and Affective Organizational Commitment: Moderating Influence of Perceived Organizational Competence. Journal of Organizational Behavior, 37(4), 558–583. https://doi.org/10.1002/job.2081

[22] Ogbonnaya, C., Tillman, C. J., & Gonzalez, K. (2018). Perceived Organizational Support in Health Care: The Importance of Teamwork and Training for Employee Well-Being and Patient Satisfaction. Group & Organization Management, 43(3), 475–503. https://doi.org/10.1177/1059601118767244

[23] Fahimi, F., Adelmehraban, M., Ghezeljeh, T. N., & Haghani, S. (2023). The Relationship Between Perceived Organizational Support With Safe Nursing Care in Nurses Working in the Intensive Care Units of Selected Hospitals in Tabriz, Iran. Iran Journal of https://doi.org/10.32598/ijn.36.142.3238

[24] Hales, D. N., & Chakravorty, S. S. (2016). Creating High Reliability Organizations Using Mindfulness. Journal of Business Research, 69(8), 2873–2881. https://doi.org/10.1016/j.jbusres.2015.12.056

[25] Riley, W., Davis, S. E., Miller, K. K., & McCullough, J. M. (2010). A Model for Developing High-Reliability Teams. Journal of Nursing Management, 18(5), 556 563. https://doi.org/10.1111/j.1365-2834.2010.01121.x

[26] Martínez-Córcoles, M. (2017). High Reliability Leadership: A Conceptual Framework. Journal of Contingencies and Crisis Management, 26(2), 237–246. https://doi.org/10.1111/1468-5973.12187

[27] Lee, Y., & Li, J.-Y. (2021). The Role of Communication Transparency and Organizational Trust in Publics' Perceptions, Attitudes and Social Distancing Behaviour: A Case Study of the COVID-19 Outbreak. Journal of Contingencies and Crisis Management, 29(4), 368–384. https://doi.org/10.1111/1468 5973.12354

[28] Jiang, H., & Luo, Y. (2018). Crafting Employee Trust: From Authenticity, Transparency to Engagement. Journal of Communication Management, 22(2), 138–160. https://doi.org/10.1108/jcom-07-2016-0055

[29] Liu, P., Lyndon, A., Holl, J. L., Johnson, J. K., Bilimoria, K. Y., & Stey, A. M. (2021). Barriers and Facilitators to Interdisciplinary Communication During Consultations: A Qualitative Study. BMJ Open, 11(9), e046111. https://doi.org/10.1136/bmjopen 2020-046111

[30] Prihatiningsih, S., Martiana, T., Widajati, N., & Fajar, J. K. (2025). Determinants of Safety Performance in Healthcare Settings: A Meta-Analysis. Narra J, 5(2), e1654. https://doi.org/10.52225/narra.v5i2.1654