

The Influence of Adaptive Leadership, Psychological Safety, and Knowledge Sharing on the Innovative Performance of Health Workers in Hospitals

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ABSTRACT

This study aims to analyze the influence of adaptive leadership, psychological safety, and knowledge sharing on the innovative performance of health workers in hospitals. The approach used is quantitative with a cross-sectional design. Data was collected through a questionnaire distributed to 280 selected respondents using purposive sampling techniques. Data analysis was carried out using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method to examine the relationships between variables in the research model. The results show that adaptive leadership, psychological safety, and knowledge sharing have a positive and significant effect on innovative performance. Among the three variables, knowledge sharing had the strongest influence, followed by psychological security and adaptive leadership. In addition, the high R-squared value indicates that the model has strong predictive ability in explaining innovative performance variations. The IPMA analysis also shows that knowledge sharing is the most important factor to improve efforts to encourage innovative performance of health workers. The conclusion of this study is that the innovative performance improvement of health workers can be achieved through strengthening knowledge sharing practices, supported by a work environment that fosters high psychological safety and adaptive leadership. The implications of this study emphasize the important role of hospital management in creating a culture of knowledge sharing and a psychologically safe work environment to encourage sustainable innovation.

INTRODUCTION

The development of the global health sector in recent years shows increasingly complex dynamics, especially since the COVID-19 pandemic has prompted major changes in the healthcare system. Hospitals as the main institution in health services are required to be able to adapt quickly to uncertain environmental changes, both in terms of technology, patient needs, and health policies. In this context, the organization's ability to continue to innovate is a key factor in maintaining service quality and organizational sustainability. Innovation is no longer seen as an option, but rather as a strategic need that must be possessed by health workers in hospitals in order to be able to face increasingly dynamic challenges (Lucero Baldevenites et al., 2025).

Innovative performance of health workers is an important element in improving the effectiveness of hospital services. Innovative performance reflects an individual's ability to generate, develop, and implement new ideas that benefit the organization. Research by Alshehri et al. (2024) shows that in health teams, information exchange and a supportive work environment have a great influence on the creation of innovative performance. This confirms that innovation in the health sector does not only depend on technology, but also on human factors and social interactions within the organization (Alshehri et al., 2024).

One of the important factors that affect innovative performance is leadership style, especially adaptive leadership. Adaptive leadership is a leadership approach that emphasizes the ability of leaders to respond to change, manage uncertainty, and encourage continuous learning in the organization. In the context of a health crisis, adaptive leadership has been proven to be able to increase organizational resilience and encourage innovation through flexibility in decision-making (Aouad et al., 2024). This shows that adaptive leaders are able to create an environment that supports the exploration of new ideas.

In addition, adaptive leadership also has a close relationship with increasing individual capacity to face change. Chughtai et al. (2024) found that adaptive leadership plays an important role in increasing organizational innovation through increasing employee self-efficacy. With self-confidence in facing change, health workers tend to be more courageous in trying new approaches and developing innovative solutions to problems faced in health services (Chughtai et al., 2024).

In addition to leadership, psychological factors also have a crucial role in encouraging innovation, one of which is psychological safety. Psychological safety refers to an individual's perception that they can convey ideas, opinions, or mistakes without fear of negative consequences (Frazier et al., 2017; Rachmad, 2022). In a stressful hospital environment, the existence of psychological safety is very important so that health workers feel safe to innovate. Brunetto et al. (2022) show that the psychosocial safety climate contributes to the well-being and innovative behaviors of health workers during the pandemic (Brunetto et al., 2022).

Furthermore, psychological safety also serves as a mechanism that strengthens the relationship between leadership and innovative performance. Ahmed et al. (2025) found that psychological safety acts as a mediator between leadership style and innovative performance, so that individuals who feel psychologically safe will be more active in providing new ideas. This shows that without a sense of security, the innovation potential of health workers cannot develop optimally (Ahmed et al., 2025).

On the other hand, organizational factors such as knowledge sharing also play an important role in improving innovative performance. In healthcare organizations, knowledge sharing is a fundamental aspect because it is directly related to the quality of service and patient safety. Elsayed et al. (2022) found that innovative work behaviors have a significant relationship with knowledge-sharing activities among nurses. With effective knowledge exchange, health workers can access new information that supports the innovation process (Elsayed et al., 2022).

Among the organizational conditions most consistently linked to innovative performance is leadership, particularly forms of leadership capable of navigating uncertainty and fostering organizational adaptability (Mei et al., 2024; Menon, 2024; Singh & Jha, 2024). Adaptive leadership an approach that emphasizes the leader's capacity to facilitate responses to

change, mobilize collective problem-solving, and distribute authority flexibly has received growing scholarly attention in health crisis contexts (Abukalusa & Oosthuizen, 2025; Sott & Bender, 2025). Aouad et al. (2024), in a study published in *BMJ Leader*, affirm that adaptive leadership significantly increases organizational resilience and encourages innovation by enabling flexibility in decision-making during periods of systemic disruption. In the aftermath of the COVID-19 pandemic, healthcare organizations that were led by adaptive leaders demonstrated greater capacity to reconfigure workflows, integrate new care protocols, and maintain staff engagement in innovation efforts (Lucero Baldevenites et al., 2025). This evidence positions adaptive leadership as a structurally important antecedent of innovative performance, especially in hospital environments where rigid hierarchical models may inhibit the responsiveness needed to sustain organizational innovation.

Beyond the direct influence of leadership on innovation, empirical research increasingly highlights psychological conditions as indispensable mechanisms through which leadership translates into innovative outcomes. Psychological safety defined as an individual's belief that expressing ideas, taking risks, or acknowledging mistakes will not result in interpersonal punishment or humiliation has been established as a foundational condition for learning and innovation in organizational settings (Edmondson & Bransby, 2023). In the healthcare context, where professional hierarchies and fear of error-reporting are endemic, psychological safety is especially consequential. Brunetto et al. (2022) found that the psychosocial safety climate significantly contributed to both the wellbeing and innovative behaviors of health workers during the COVID-19 pandemic, with workers in psychologically safer climates demonstrating markedly higher rates of innovation engagement. Furthermore, a systematic review protocol by Shankar et al. (2025) published in *Qualitative Research in Organizations and Management* confirms that leadership behaviors constitute the primary structural driver of psychological safety within healthcare teams, establishing a theoretically coherent pathway from adaptive leadership through psychological safety to innovative output.

Equally central to the innovation process in healthcare organizations is knowledge sharing, which refers to the deliberate exchange of information, expertise, and insights among individuals within a collective setting. In hospital environments, knowledge sharing serves a dual function: it directly supports the quality and safety of clinical practice, and it fuels the organizational learning processes from which innovation emerges. Elsayed et al. (2022), in the *Zagazig Nursing Journal*, documented a significant positive relationship between knowledge-sharing behaviors and innovative work performance among nurses, establishing that access to shared knowledge expands the informational repertoire available for creative problem-solving. Yang et al. (2020), in the *VINE Journal of Information and Knowledge Management Systems*, further demonstrated that knowledge sharing promotes innovation by altering individual attitudes toward learning and generating openness to novel ideas. More recently, Gharajeh-Alamdari et al. (2025), publishing in *BMC Nursing*, confirmed that supervisor knowledge-sharing behavior significantly predicted innovative behaviors among clinical nurses, mediated by organizational learning. Taken together, these studies construct a compelling body of evidence situating knowledge sharing at the heart of the innovation process in health organizations.

Despite the substantial individual body of literature on adaptive leadership, psychological safety, and knowledge sharing, there remains a critical research gap regarding

their simultaneous examination within hospital contexts, particularly in developing country settings. A bibliometric analysis published in *Administrative Sciences* (2025) reveals that while connections between psychological safety, knowledge management, and organizational learning are increasingly recognized, the literature remains largely fragmented, with studies rarely integrating these constructs within unified empirical frameworks especially in healthcare settings (Santos et al., 2025). Furthermore, Xu and Suntrayuth (2022), publishing in *Frontiers in Psychology*, demonstrated the chain mediation effects of psychological safety and knowledge sharing in predicting innovative work behavior, yet their study was conducted in high-technology enterprises in China, rendering direct application to hospital contexts limited. Similarly, the work of Zahrawi and Hussien (2023) on knowledge sharing and organizational performance in the Jordanian healthcare sector, while providing important regional insights, does not account for the concurrent role of leadership and psychological safety as co-determinants. This fragmentation reflects a meaningful gap in the literature: no study has empirically tested the integrated effects of all three constructs adaptive leadership, psychological safety, and knowledge sharing on the innovative performance of health workers within a hospital-based quantitative framework.

This research gap is rendered particularly urgent by the institutional realities facing hospitals in developing countries, including Indonesia, where healthcare systems face intensifying pressure to innovate amid resource constraints, workforce maldistribution, and systemic transformation. Indonesia's Ministry of Health has identified health workforce transformation as a central pillar of its national Health System Transformation agenda for 2022–2030, enacting the Health Omnibus Law in 2023 to restructure health professional regulation, improve workforce quality, and close urban-rural gaps in service provision (WHO Country Profile, 2024). Despite this policy emphasis, Indonesia's healthcare landscape continues to grapple with challenges including low health spending relative to household expenditure, uneven distribution of specialist workers, and an organizational culture in hospitals that has not yet fully embraced systematic innovation practices (Rahman, 2024). In this context, identifying the organizational mechanisms including leadership behaviors, psychological workplace conditions, and knowledge-sharing practices that can meaningfully drive innovative performance among health workers is not merely an academic question but a policy-relevant imperative with direct implications for health system quality and sustainability.

The novelty of this research lies in its simultaneous empirical examination of adaptive leadership, psychological safety, and knowledge sharing as co-determinants of innovative performance, tested within a hospital-based sample using Partial Least Squares Structural Equation Modeling (PLS-SEM). While prior studies have addressed pairwise relationships between these constructs, none has produced a unified empirical model in the hospital context that captures the relative weight of all three predictors simultaneously, including an importance-performance analysis (IPMA) to identify which variable yields the greatest practical leverage for managerial intervention. This design addresses a theoretically and methodologically underexplored space in the healthcare management literature and generates findings that are directly applicable to hospital leadership practice. Furthermore, by situating the study within an Indonesian hospital setting, this research extends existing knowledge beyond the predominantly Western and manufacturing-sector contexts that characterize most prior studies on these

variables, thereby broadening the generalizability and contextual relevance of the theoretical framework.

The purpose of this research is to empirically analyze the influence of adaptive leadership, psychological safety, and knowledge sharing on the innovative performance of health workers in hospitals, and to identify the relative importance and performance levels of each predictor variable through IPMA analysis. The study adopts a quantitative cross-sectional design with PLS-SEM as its analytical method, drawing on a purposive sample of 280 health workers employed in hospital settings. By testing these relationships within an integrated structural model, the research aims to contribute both theoretically by extending the application of adaptive leadership theory and organizational learning frameworks to hospital-based innovation and practically, by generating actionable insights for hospital management seeking to strengthen the conditions that enable their workforce to innovate. The findings are intended to inform strategic decisions regarding leadership development, the cultivation of psychologically safe work climates, and the institutionalization of knowledge-sharing practices in healthcare organizations.

This research contributes to academic knowledge by offering an integrated empirical model of innovation in hospital settings, filling a gap in the literature by simultaneously incorporating adaptive leadership, psychological safety, and knowledge sharing as predictors of health worker innovative performance. The research benefits extend beyond theoretical contribution: for hospital administrators and human resource practitioners, the findings provide evidence-based guidance on which organizational levers leadership capacity, psychological climate, or knowledge infrastructure yield the greatest impact on workforce innovation, as quantified through IPMA. For policymakers engaged in healthcare system transformation, the study offers empirical grounding for workforce development strategies that prioritize both the structural and relational conditions of innovation. Ultimately, this research advances the broader goal of building innovative, resilient health organizations capable of meeting the demands of rapidly evolving health environments, contributing to the sustained improvement of hospital service quality and organizational performance in developing country contexts.

RESEARCH METHODS

This research employed a quantitative approach with a cross-sectional survey design, which was selected because the study aims to examine the causal relationships among adaptive leadership, psychological safety, knowledge sharing, and innovative performance through statistical hypothesis testing at a single point in time. A quantitative design is appropriate here because the research objectives require measurement of constructs using standardized instruments and the examination of directional relationships within a structural model, consistent with the positivist epistemological stance that underpins empirical management research (Hair et al., 2021). The target population of this study comprises all health workers including nurses, physicians, allied health professionals, and administrative health staff who are actively employed in hospital settings and directly involved in patient care or clinical service activities. From this population, a total of 280 respondents were selected as the research sample using purposive sampling, a non-probability technique in which participants are chosen based on predefined eligibility criteria rather than random selection. Specifically, the criteria required that each respondent had accumulated a minimum of one year of active employment in their

respective hospital, was involved in direct service delivery activities, and was willing to participate voluntarily. This technique was deemed appropriate because the study requires respondents with sufficient experiential depth to meaningfully assess leadership behaviors, psychological climate, and knowledge-sharing practices within their organizations; a minimum sample size of 280 is considered adequate for variance-based structural equation modeling when the research model involves multiple latent constructs, consistent with the rule-of-thumb thresholds established by Hair et al. (2021) for PLS-SEM applications.

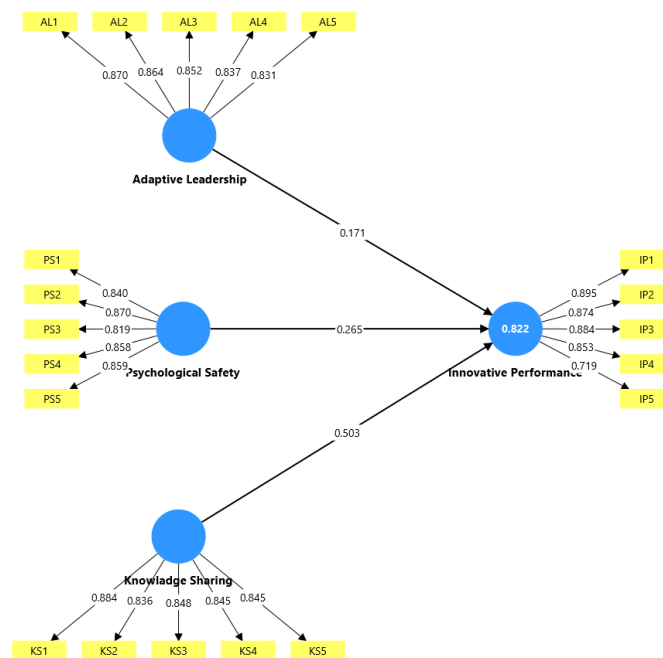
Data in this study were collected through a structured self-administered questionnaire developed on the basis of established and validated scales drawn from the existing literature, ensuring content validity through theoretical grounding. The adaptive leadership variable was operationalized using five items adapted from instruments applied in prior leadership research in organizational contexts, capturing dimensions of flexibility, uncertainty management, and the stimulation of learning behaviors among team members. Psychological safety was measured using five items adapted from Edmondson's (1999) seminal psychological safety scale, widely employed and validated across healthcare and organizational research settings. Knowledge sharing was assessed through five items reflecting both knowledge donating and knowledge collecting behaviors, adapted from scales validated in health and knowledge management literature. Finally, innovative performance was operationalized using five items capturing idea generation, promotion, and implementation behaviors, consistent with the three-stage model of individual innovation proposed by Scott and Bruce (1994). All items were measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Prior to the main data collection, a pilot test was conducted with 30 respondents drawn from the target population to assess instrument clarity and preliminary psychometric properties. The validity of each construct was evaluated using convergent validity, assessed through outer loadings and average variance extracted (AVE), and discriminant validity, assessed through the Fornell-Larcker criterion, both of which are standard procedures in PLS-SEM outer model evaluation (Hair et al., 2021). Reliability was assessed using Cronbach's alpha and composite reliability (ρ_c), with acceptable thresholds set at values above 0.70. The main data collection was conducted through direct distribution and retrieval of printed questionnaires at participating hospitals over a defined data collection period, with research assistants present to clarify procedural questions and ensure complete response submission.

The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), executed through SmartPLS version 4.0 software. PLS-SEM was selected over covariance-based SEM (CB-SEM) for several methodological reasons: it performs robustly with moderately sized samples, does not require multivariate normality of the data, and is particularly suited to predictive-oriented research involving multiple latent constructs with reflective measurement models (Hair et al., 2021). The analysis proceeded in two sequential stages in accordance with established PLS-SEM protocols. The first stage involved evaluation of the outer model (measurement model), which examined the reliability and validity of the research instruments through assessment of indicator outer loadings, internal consistency reliability (Cronbach's alpha and composite reliability), convergent validity (AVE), and discriminant validity (Fornell-Larcker criterion). The second stage involved evaluation of the inner model (structural model), which tested the hypothesized relationships among the latent variables through path coefficients, coefficient of determination (R^2), effect size (f^2), and

predictive relevance (Q^2_{predict}) estimated via blindfolding procedures. Multicollinearity among indicators was assessed through Variance Inflation Factor (VIF) values, with thresholds below 5.0 considered acceptable. Hypothesis testing was performed using a bootstrapping procedure with 5,000 subsamples to generate stable t-statistics and p-values for each structural path. In addition to standard hypothesis testing, an Importance-Performance Map Analysis (IPMA) was conducted to identify the relative importance and current performance levels of each predictor variable with respect to innovative performance, thereby translating statistical findings into prioritized, actionable managerial recommendations. This integrated analytical procedure ensures that the study generates findings that are both statistically rigorous and practically meaningful for healthcare human resource management.

RESULTS AND DISCUSSION

Outer Model



Gambar 2. Outer Model

Tabel 1. Outer loadings

	Outer loadings
<i>AL1</i> <- Adaptive Leadership	0.870
<i>AL2</i> <- Adaptive Leadership	0.864
<i>AL3</i> <- Adaptive Leadership	0.852
<i>AL4</i> <- Adaptive Leadership	0.837
<i>AL5</i> <- Adaptive Leadership	0.831
<i>IP1</i> <- Innovative Performance	0.895
<i>IP2</i> <- Innovative Performance	0.874
<i>IP3</i> <- Innovative Performance	0.884
<i>IP4</i> <- Innovative Performance	0.853
<i>IP5</i> <- Innovative Performance	0.719
<i>KS1</i> <- Knowledge Sharing	0.884

	Outer loadings
<i>KS2 <- Knowledge Sharing</i>	0.836
<i>KS3 <- Knowledge Sharing</i>	0.848
<i>KS4 <- Knowledge Sharing</i>	0.845
<i>KS5 <- Knowledge Sharing</i>	0.845
<i>PS1 <- Psychological Safety</i>	0.840
<i>PS2 <- Psychological Safety</i>	0.870
<i>PS3 <- Psychological Safety</i>	0.819
<i>PS4 <- Psychological Safety</i>	0.858
<i>PS5 <- Psychological Safety</i>	0.859

Source: Outer Loadings Primary data processed with SmartPLS 4.0 (2024)

The results of the outer model evaluation showed that all indicators had an outer loadings value above the minimum limit of 0.70, so that it could be declared to have good convergent validity. The indicator on the adaptive leadership variable has a loading value ranging from 0.831 to 0.870, which indicates that all items are able to represent the construct very well. In the innovative performance variable, most indicators have high values (above 0.85), although there is one indicator (IP5) with a value of 0.719 that is still acceptable because it is above the minimum threshold. The variables of knowledge sharing and psychological safety also show strong loading values, so that all indicators are declared valid in measuring their respective constructs.

Table 2. Discriminatory Validity

	<i>Adaptive Leadership</i>	<i>Innovative Performance</i>	<i>Knowledge Sharing</i>	<i>Psychological Safety</i>
<i>Adaptive Leadership</i>	0.851			
<i>Innovative Performance</i>	0.860	0.848		
<i>Knowledge Sharing</i>	0.891	0.888	0.852	
<i>Psychological Safety</i>	0.906	0.862	0.858	0.849

Source; Discriminant Validity Primary data processed with SmartPLS 4.0 (2024)

Furthermore, the results of the discriminant validity test using the Fornell-Larcker criterion showed that the square root value of AVE in each construct was greater than the correlation value between other constructs in the model. This condition indicates that each variable has a good level of discriminant validity because it is able to explain the variance of the indicator itself is greater than the variance described by other constructs. Thus, based on the Fornell-Larcker criteria, it can be concluded that all constructs in this study have met the discriminant validity, so that each variable truly represents a different concept empirically.

Table 3. Validity and Reliability

	<i>Cronbach's alpha</i>	<i>Composite reliability (rho_a)</i>	<i>Composite reliability (rho_c)</i>	<i>Average variance extracted (AVE)</i>
<i>Adaptive Leadership</i>	0.905	0.905	0.929	0.724
<i>Innovative Performance</i>	0.900	0.907	0.927	0.718
<i>Knowledge Sharing</i>	0.905	0.906	0.930	0.725
<i>Psychological Safety</i>	0.903	0.905	0.928	0.721

Source: Validity and Reliability Primary data processed with SmartPLS 4.0 (2024)

In the reliability test, all variables showed Cronbach's alpha and composite reliability values that were above 0.70, even close to or exceeding 0.90. The average variance extracted (AVE) value for each construct is also above 0.50, which indicates that the variable is able to explain more than 50% of the variance of the indicator. These results show that all constructs in this study have an excellent level of reliability and are consistent in measuring the concepts studied.

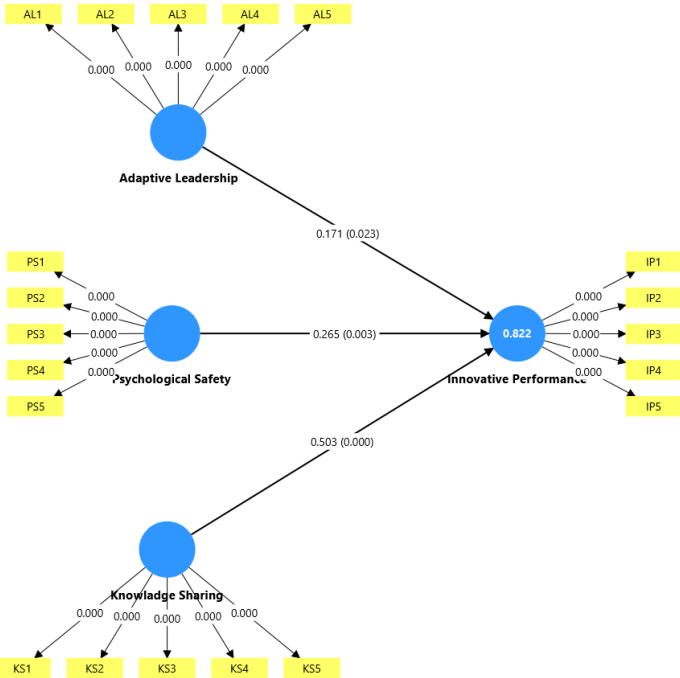
Tabel 4. Vif

	VIF
AL1	2.653
AL2	2.629
AL3	2.429
AL4	2.252
AL5	2.173
IP1	3.294
IP2	2.864
IP3	2.876
IP4	2.556
IP5	1.565
KS1	3.022
KS2	2.387
KS3	2.370
KS4	2.410
KS5	2.281
PS1	2.248
PS2	2.643
PS3	2.139
PS4	2.493
PS5	2.502

Source: VIF Primary data processed with SmartPLS 4.0 (2024)

Multicollinearity testing through VIF values showed that all indicators had VIF values below 5. This means that there is no problem of multicollinearity in the research model, so that the relationships between independent variables do not interfere with each other and the model estimation results can be considered stable and can be interpreted more accurately.

Inner Model



Gambar 3. Inner Model

Tabel 5. R-Square

	R-square	R-square adjusted
<i>Innovative Performance</i>	0.822	0.820

Source: R-Square Primary data processed with SmartPLS 4.0 (2024)

The results of the R-square test showed that the innovative performance variable had a value of 0.822, which means that 82.2% of the variation in innovative performance can be explained by the variables of adaptive leadership, knowledge sharing, and psychological safety. This value is relatively high, so the research model has a strong predictive ability in explaining the phenomenon being studied.

Tabel 6. F-Square

	f-square
<i>Adaptive Leadership -> Innovative Performance</i>	0.023
<i>Knowledge Sharing -> Innovative Performance</i>	0.253
<i>Psychological Safety -> Innovative Performance</i>	0.061

Source: F-Square Primary data processed with SmartPLS 4.0 (2024)

Furthermore, the f-square value shows that knowledge sharing has the greatest influence on innovative performance with a value of 0.253 (medium category), followed by psychological safety of 0.061 (small category), and adaptive leadership of 0.023 (small category). This indicates that knowledge sharing is the most dominant variable in explaining the increase in innovative performance compared to other variables.

Tabel 7. Q-Square

	Q²predict
<i>Innovative Performance</i>	0.817

Source: Q-Square Primary data processed with SmartPLS 4.0 (2024)

The Q-square result of 0.817 shows that the model has excellent predictive relevance. This value indicates that the model is able to predict observational data with a high level of accuracy, making it feasible to use it to explain the relationship between variables in this study.

Table 8. Hypothesis Test

	Original sample (O)	T statistics (O/STDEV)	P values	Result
<i>Adaptive Leadership -> Innovative Performance</i>	0.171	1.988	0.023	Accepted
<i>Knowledge Sharing -> Innovative Performance</i>	0.503	7.126	0.000	Accepted
<i>Psychological Safety -> Innovative Performance</i>	0.265	2.766	0.003	Accepted

Source: Hypothesis Test Primary data processed with SmartPLS 4.0 (2024)

In the hypothesis test, the relationship between adaptive leadership and innovative performance showed a coefficient value of 0.171 with a statistical T-value of 1.988 and a P-value of 0.023. These results show that adaptive leadership has a positive and significant effect on innovative performance. This means that the higher the application of adaptive leadership in hospital organizations, the more innovative performance of health workers will increase, even though the influence is relatively small compared to other variables.

Furthermore, the relationship between knowledge sharing and innovative performance showed a coefficient value of 0.503 with a T-statistic of 7.126 and a P-value of 0.000. These results show that knowledge sharing has a positive and significant influence on innovative performance, and is the variable with the strongest influence in the model. This indicates that the increase in knowledge sharing activities is significantly able to encourage the creation of innovation among health workers.

Meanwhile, the relationship between psychological safety and innovative performance showed a coefficient value of 0.265 with a T-statistic of 2.766 and a P-value of 0.003. These results show that psychological safety has a positive and significant effect on innovative performance. This means that the higher the level of psychological security felt by health workers, the greater their tendency to innovate in work.

IPMA

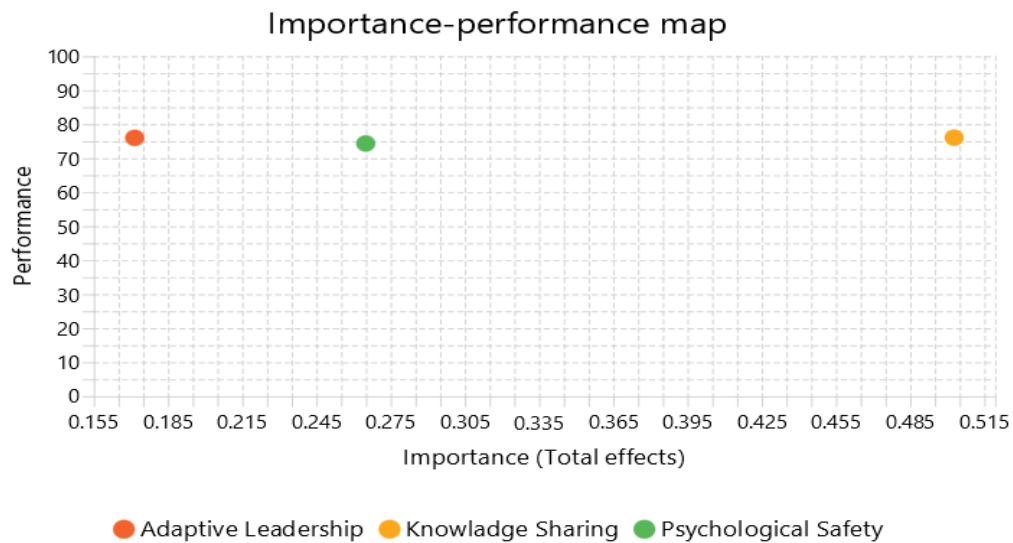


Figure 4. IPMA Map

The results of the IPMA analysis showed that knowledge sharing had the highest level of importance with a value of 0.503, followed by psychological safety of 0.265, and adaptive leadership of 0.171. In terms of performance, the three variables have relatively high and balanced values, with knowledge sharing slightly superior. This shows that even though all variables are already at a good level of performance, the improvement in the aspect of knowledge sharing will have the greatest impact in increasing the innovative performance of health workers.

The discussion of the results of this study shows that adaptive leadership has a positive and significant influence on innovative performance, even though it has a relatively small power of influence. This indicates that adaptive leadership continues to play a role in driving innovation, especially through its ability to cope with change and create a flexible work environment. These findings are in line with the research of Aouad et al. (2024) which affirms that adaptive leadership is able to increase organizational resilience and encourage innovation in crisis situations. In addition, Chughtai et al. (2024) also show that adaptive leadership increases innovation through increased change self-efficacy. However, the small value of f-square suggests that the direct influence on innovative performance is not dominant, so it is likely that the adaptive leadership effect works more through other variables such as psychological conditions or organizational mechanisms.

Furthermore, knowledge sharing has been proven to have the strongest positive and significant influence on innovative performance, with the highest coefficient value compared to other variables. This shows that the knowledge exchange process is a key factor in encouraging innovation in the hospital environment. These findings are consistent with Elsayed et al. (2022) who found that knowledge sharing behaviors have a significant relationship with the innovative work behaviors of health workers. In addition, Yang et al. (2020) emphasized that knowledge sharing is able to increase innovation through the formation of positive attitudes towards learning. Zahrawi and Hussien (2023) also strengthen these findings by showing that knowledge sharing contributes to organizational performance through innovation as a

mediating variable. Thus, the results of this study confirm that innovation in the health sector is highly dependent on the extent to which knowledge can be effectively shared among health workers.

On the other hand, psychological safety also shows a positive and significant influence on innovative performance. This indicates that a sense of psychological security is an important factor that allows health workers to dare to express ideas, share knowledge, and take risks in innovating. These findings are in line with Brunetto et al. (2022) who stated that psychological safety contributes to the innovative behavior of health workers, especially in stressful work situations. In addition, Ahmed et al. (2025) show that psychological safety acts as a mediator between leadership and innovative performance, while Zhao et al. (2023) affirm that a psychologically safe work environment is able to improve employee innovative performance. Thus, psychological safety can be understood as an important foundation in creating innovation in the hospital environment.

Based on the results of the IPMA analysis, knowledge sharing has the highest level of importance in influencing innovative performance, followed by psychological safety and adaptive leadership. This shows that although all variables have a significant influence, improvements in the aspect of knowledge sharing will have the greatest impact on improving innovative performance. These findings reinforce the results of previous research that placed knowledge sharing as a key mechanism in driving organizational innovation (Yang et al., 2020). In addition, the role of psychological safety as a supporting factor is also seen as important because it allows for a more open knowledge sharing process (Ahmed et al., 2025).

In terms of performance, the three variables show relatively high and balanced values, which indicates that the current conditions in the organization are good enough to support innovation. However, because knowledge sharing has the highest importance value, a small increase in this variable has the potential to have a greater impact than an increase in other variables. This is also in line with the findings of Blouch et al. (2021) who stated that knowledge sharing practices in the health sector, especially in developing countries, still face various challenges so that there is a lot of room for improvement. Thus, hospital management needs to prioritize strengthening the culture of knowledge sharing as the main strategy in improving the innovative performance of health workers, without ignoring the role of adaptive leadership and psychological safety as complementary supporting factors.

CONCLUSION

Adaptive leadership, knowledge sharing, and psychological safety all positively and significantly affect the innovative performance of hospital health workers. Among these, knowledge sharing has the strongest influence, followed by psychological safety and adaptive leadership. The high R-square value confirms that these three variables effectively explain variations in innovative performance. This study has several limitations: (1) a cross-sectional design that cannot capture changes over time, (2) purposive sampling that limits generalizability, (3) focus on only three variables, excluding factors like organizational culture or technology, and (4) self-reported data that may contain perception bias. Hospitals should prioritize knowledge sharing through discussion forums, collaborative training, and digital platforms. Management also needs to build psychological safety by encouraging open communication and reducing blame culture, while leaders should strengthen their adaptive

skills to better drive innovation and empower teams. Future studies should include mediation or moderation variables such as employee engagement or digital technology, use longitudinal designs, and expand to various hospital types to improve generalizability and deepen understanding of innovative performance in healthcare.

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