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Super Leadership and Nurse Performance at Kendari Regional Hospital: The Mediating Roles of Work Environment and Work Engagement

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ABSTRACT:

Introduction: Nurses are the backbone of healthcare services, but they face significant challenges in the form of high workloads. At Kendari City Hospital, systemic pressure is evident in the surge in Bed Occupancy Rate (BOR) to 88.76% and the short Turnover Interval (TOI) (1 day). This phenomenon demands a leadership model that builds nurse independence through super leadership. This study aims to analyze the effect of super leadership on nurse performance, with the work environment and work engagement as mediating variables.

Methods: This type of quantitative research used a cross-sectional design, conducted at Kendari City Hospital from January to June 2026. The sample consisted of 167 nurses using proportional stratified random sampling technique. Data were collected through questionnaires adapted from standardized instruments (Superleadership Questionnaire, PES-NWI, UWES, and performance scale). Data analysis used Partial Least Squares Structural Equation Modeling (PLS-SEM).

Results: The analysis showed that super leadership did not have a significant direct effect on nurse performance ($p = 0.524$). However, all mediation paths were found to be significant ($p < 0.05$). A strong mediation effect was found in the influence of super leadership on nurse performance through work engagement (indirect effect = 0.516; $p = 0.000$). In addition, there was a significant serial mediation effect of super leadership through the work environment and work engagement on nurse performance (effect = 0.093; $p = 0.022$). This model was able to explain 44.6% of the variance in nurse performance ($R^2 = 0.446$).

Conclusion: Super leadership is effective in indirectly improving nurses' clinical performance when it successfully builds high work engagement and is supported by an improved work environment. Hospital management is advised to implement this approach to maintain the quality of care amidst high service intensity.

1. INTRODUCTION

In the healthcare industry, hospitals hold a strategic position because they provide services directly related to human safety. The quality of hospital services is determined not only by technological sophistication and medical competence, but also by the consistency of the service processes carried out by healthcare workers, particularly nurses. Globally, the nursing profession

faces severe systemic challenges, including workforce shortages and unequal distribution. The State of the World's Nursing report shows that although the global nursing shortage is projected to decrease, 78% of nurses remain concentrated in countries with 49% of the global population, creating a high workload that threatens patient safety [1,2]. Digital transformation and automation do not necessarily reduce the complexity of these challenges; the AONL Nursing Leadership Insight Study (2025) report confirms that recruitment, retention, workload, and emotional well-being remain key challenges, placing nurse performance at a critical point for global health security [3,4]. Nurse performance is the result of a complex interaction between organisational and psychological factors, in which low work engagement and managerial support can trigger medical errors, accounting for up to 18% of total patient safety incidents [5,6]

This systemic pressure phenomenon is clearly illustrated at Kendari City Hospital, where service quality indicators indicate a chronically high service load. Hospital profile data shows a significant upward trend in the Bed Occupancy Rate (BOR) from 50.80% in 2022 to 88.76% in 2024, accompanied by a decrease in the Turnover Interval (TOI) to 1 day (7). This combination of a high BOR and a very low TOI indicates a fast-paced work rhythm and minimal preparation time between patients, placing nurses under intense work pressure. Despite positive achievements, such as zero events in several patient safety indicators [8], these achievements require extra consistency in performance amidst chronic systemic pressure. In these high-intensity conditions, traditional instructional leadership models are no longer effective. Nurses are required to have independence and self-management skills (self-leadership), making the super leadership approach, where leaders strategically build self-leadership capacity in their followers, highly relevant [9]

Theoretically, the influence of super leadership on nurse performance does not occur automatically, but rather requires supportive contextual and psychological conditions. Integrating the Work Demands-Resources (JD-R) model and Self-Determination Theory (SDT), recent literature demonstrates that empowering leaders significantly shapes nurses' perceptions of the work environment by providing work resources such as autonomy and support [10,11]. Furthermore, a supportive work environment will facilitate psychological engagement, manifested in the form of work engagement. Work engagement acts as a vital bridge; nurses with high levels of engagement will devote full physical, cognitive, and emotional energy, enabling them to persist and perform optimally despite facing heavy work demands [12]

Previous research has examined the influence of leadership on nurse outcomes. Studies on authentic leadership demonstrate its role in enhancing self-efficacy [13,14] while studies on servant leadership and nurse leadership link leadership style to the work environment and evidence-based practices [15,16]. However, most of these studies focus on single outcomes such as well-being or leadership aspirations, without simultaneously modelling how empowering leadership works through a pathway to improved work environments that then triggers work engagement and result in clinical performance [17].

Based on the literature review, there are three research gaps: First, empirical studies on super leadership in the context of nursing in regional/public hospitals in developing countries are still very limited. Generalisation of findings from hospitals in developed countries or specific care units (such as the ICU) cannot necessarily be applied to regional hospitals in Indonesia, which have unique bureaucratic characteristics, local culture, and systemic pressures (high BOR, low TOI) such as those at Kendari City Hospital. Second, studies tend to test the direct effect or use only one mediating variable. Not many studies have integrated and sequentially modelled how super leadership works through a dual pathway, namely improving the work environment (resources and autonomy), then triggering work engagement to produce performance. Third, an initial survey at Kendari City Hospital showed that although work enthusiasm was relatively good, the aspect of work autonomy was not as strong as other indicators, reinforcing the need for empirical testing of leadership mechanisms that foster nurse independence.

Based on the problem description and literature gaps, this research is highly urgent to be conducted as a scientific basis for hospital management in designing strategies to improve service quality. This study aims to analyse and prove the influence of super leadership on nurse performance, by positioning the work environment and work engagement as sequential mediation variables. Through this integrative model, this research is expected to not only enrich the treasury of contemporary nursing management theory by filling the literature gap regarding dual mediation pathways, but also provide practical implications for hospital leaders in creating a work ecosystem that empowers, autonomises, and motivates nurses amidst the high intensity of health care services.

2. MATERIALS AND METHODS

2.1 Research Design

This study used a quantitative approach with a cross-sectional design to examine causal relationships and mediating effects between variables. The study was conducted at Kendari City Hospital, Southeast Sulawesi. This location was chosen because it is a major referral hospital with high service intensity (characterised by high BOR and low TOI), making it relevant for evaluating nurse performance under systemic pressure. The study was conducted over a six-month period, from January 2026 to June 2026.

2.2 Population and Sample

The target population in this study was all registered nurses working in 16 inpatient and intensive care units at Kendari city hospital. Based on personnel data for December 2025, the total population was 286 nurses. The sample size was determined using the Slovin formula with a margin of error of 5%, resulting in a minimum sample size of 167 respondents. Proportional stratified random sampling was used to ensure adequate representation from various heterogeneous work units (such as the ICU, ER, and general inpatient). Inclusion criteria included: registered nurses with at least one year of clinical experience, and willingness to participate voluntarily.

2.3 Instruments

Data were collected using a self-administered questionnaire with a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) that adapted standardized and validated instruments, including: [18] Superleadership from the Superleadership Questionnaire by Manz & Sims that measures behavioral modeling, goal setting, and self-esteem; Work Environment from the Practice Environment Scale of the Nursing Work Index (PES-NWI) by Lake that assesses room layout, equipment completeness, coworker relationships, and work safety; Work Engagement using the Utrecht Work Engagement Scale (UWES) by Schaufeli that includes dimensions of vigour, dedication, and absorption; and Nurse Performance adapted from a standard scale to evaluate quality of care, quantity of work, punctuality, initiative, and teamwork, where before the main study a pilot test was conducted to ensure construct validity using Confirmatory Factor Analysis and internal consistency with a Cronbach's Alpha value > 0.70 .

2.4 Data Collection

The data collection process began with obtaining official permission from the hospital director and the head of nursing. Research assistants distributed questionnaires electronically or in hard copy during nurse shift changes to minimise disruption to patient care. To mitigate common method bias, respondent anonymity was strictly maintained, and an introductory sheet explaining the study's purpose, data confidentiality, and the voluntary nature of participation was provided.

2.5 Data Analysis

Data analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) through the device software SmartPLS. PLS-SEM was chosen because of its robustness in handling complex models with many mediating variables and its ability to operate without strict assumptions of data normality [19]. The analysis followed a two-step approach: 1) evaluating the measurement model (outer model) to assess convergent validity (factor loading > 0.70 ; AVE > 0.50), discriminant validity (HTMT ratio < 0.90), and reliability (Cronbach's Alpha and Composite Reliability > 0.70); and 2) evaluating the structural model (inner model) to determine the coefficient of determination (R^2), path coefficients, and hypothesis testing. The significance of direct and indirect (mediation) effects was tested using a bootstrapping procedure with 5,000 subsamples [20,21].

2.6 Ethics Approval

Ethical clearance was obtained from the Health Research Ethics Committee. Four core ethical principles were upheld: autonomy (informed consent was obtained before data collection), beneficence (ensuring no physical or psychological harm to respondents), confidentiality (identities were protected using codes, not names), and justice (fair and proportional selection of respondents across hospital units).

3. RESULTS AND DISCUSSION

3.1 Demographic Characteristics of Participants

The characteristics of respondents in this study can be seen in the following table.

Table 1. Characteristics of respondents

Characteristics	Description	Frequency	%
Gender	Man Woman	40 127	24.0 76.0
Age (Years)	24-35 36-47	75 92	44.9 55.1
Work Period (Years)	2-12 13-23	140 27	83.8 16.2
Level of education	3-year diploma Nurses	80 87	47.9 52.1

Table 1 shows the characteristics of the 167 respondents, showing the dominance of female nursing staff, as many as 127 respondents (76.0%) compared to men (24.0%). In terms of demographics, the majority of respondents are in the 36-47 years age range (55.1%), in line with the length of service, where the majority of respondents (83.8% or 140 respondents) have had work experience for 2-12 years, while only 16.2% have a longer work experience (13-23 years). In addition, the educational level of respondents is distributed relatively evenly, with a slightly larger proportion held by nurses with a Nursing degree (87 respondents (52.1%) compared to Diploma 3 graduates (47.9%), which overall describes the profile of respondents who already have mature work experience but are still in their optimal productive period.

3.2 Measurement Model Assessment (Outer Loading)

Table 2. Evaluation results of the measurement model

Construct	Indicator	Outer loading	Cronbach Alpha	(Rho_a)	Rho_C)	(AVE)
Super Leadership	Modeling	0.965	0.985	0.985	0.987	0.917
Super Leadership	Goal setting	0.959	0.985	0.985	0.987	0.917
Super Leadership	Positive thorunght pateems	0.956	0.985	0.985	0.987	0.917
Super Leadership	Self-reward	0.960	0.985	0.985	0.987	0.917
Super Leadership	Constructive reprimand	0.956	0.985	0.985	0.987	0.917
Super Leadership	Self-leading teams	0.961	0.985	0.985	0.987	0.917
Super Leadership	Self-leadership culture	0.944	0.985	0.985	0.987	0.917

Construct	Indicator	Outer loading	Cronbach Alpha	(Rho_a)	Rho_C)	(AVE)
Work environment	Spatial planning and layout	0.986	0.991	0.991	0.993	0.965
Work environment	Completeness Media equipment	0.981	0.991	0.991	0.993	0.965
Work environment	Connection with Coworkers	0.980	0.991	0.991	0.993	0.965
Work environment	Development career	0.982	0.991	0.991	0.993	0.965
Work environment	Occupational Health and Safety	0.983	0.991	0.991	0.993	0.965
Work Engagement	Vigour	0.985	0.985	0.985	0.990	0.971
Work Engagement	Dedication	0.983	0.985	0.985	0.990	0.971
Work Engagement	Absorption	0.987	0.985	0.985	0.990	0.971
Nurse Performance	Quality service	0.967	0.987	0.987	0.989	0.938
Nurse Performance	Quantity work	0.968	0.987	0.987	0.989	0.938
Nurse Performance	Accuracy time	0.967	0.987	0.987	0.989	0.938
Nurse Performance	Initiative and independence	0.970	0.987	0.987	0.989	0.938
Nurse Performance	Teamwork	0.967	0.987	0.987	0.989	0.938
Nurse Performance	Satisfaction patient	0.973	0.987	0.987	0.989	0.938

Table 2 shows that the measurement model evaluation results show that the convergent validity and internal reliability of all constructs are at a very satisfactory level. All indicator outer loading values range from 0.944 to 0.986, far exceeding the minimum threshold of 0.70, indicating that each indicator strongly reflects the construct. Furthermore, the Cronbach's Alpha, Rho_A, and Composite Reliability (Rho_C) values for all variables, including Super Leadership, Work Environment, Work Engagement, and Nurse Performance, consistently exceed 0.98, demonstrating the high internal consistency of this

measurement tool. The Average Variance Extracted (AVE) value was also very good, ranging from 0.917 to 0.971, exceeding the minimum criterion of 0.50. Therefore, this measurement model is deemed valid and reliable for use in further structural analysis.

3.3 Discriminant Validity

Table 3. Fornell–Larcker criteria and discriminant validity

Construct	(M2)	(Y)	(M1)	(X)
Work Engagement (M2)	0.985			
Nurse Performance (Y)	0.641	0.968		
Work Environment (M1)	0.551	0.201	0.982	
Super Leadership (X)	0.762	0.455	0.476	0.957

Table 3 explains that all constructs in the model have met the discriminant validity requirements. This is evidenced by the square root value of the average variance extracted (AVE) located on the main diagonal (work engagement = 0.985; nurse performance = 0.968; work environment = 0.982; and super leadership = 0.957. Consistently higher compared to the correlation values between other constructs located outside the diagonal (the highest correlation value is only 0.762 between super leadership and work involvement). This condition confirms that each construct has a greater variance with its own indicators than with other constructs, thus ensuring that each variable (work engagement, nurse performance, work environment, and super leadership).

Table 4. Discriminant validity of the Heterotrait–Monotrait Ratio (HTMT)

Construct	(M2)	(Y)	(M1)	(X)
Work Engagement (M2)				
Nurse Performance (Y)	0.651			
Work Environment (M1)	0.558	0.203		
Super Leadership (X)	0.773	0.461	0.482	

Based on the results of the discriminant validity test using the Heterotrait–Monotrait Ratio (HTMT) value in Table 4, all inter-construct correlation values are below the conservative threshold of 0.85 (Henseler et al., 2015). The highest HTMT value was recorded in the relationship between Super Leadership (X) and Work Engagement (M2) at 0.773, while the lowest value was in the relationship between Nurse Performance (Y) and Work Environment (M1) at 0.203. Because none of the HTMT values exceeded the limit of 0.85 or the loose limit of 0.90, it can be concluded that all constructs in this study, namely Work Engagement (M2), Nurse Performance (Y), Work Environment (M1), and Super Leadership (X), have good discriminant validity.

3.4 R-Square Assessment

Table 5. R-square assessment

Construct	R Square
Work Engagement (M2)	0.626
Nurse Performance (Y)	0.446
Work Environment (M1)	0.227

Based on the results of the discriminant validity test using the Heterotrait-Monotrait Ratio (HTMT) value in Table 4, all inter-construct correlation values are below the conservative threshold of 0.85 (Henseler et al., 2015). The highest HTMT value was recorded in the relationship between Super Leadership (X) and Work Engagement (M2) at 0.773, while the lowest value was in the relationship between Nurse Performance (Y) and Work Environment (M1) at 0.203. Because none of the HTMT values exceeded the limit of 0.85 or the loose limit of 0.90, it can be concluded that all constructs in this study, namely Work Engagement (M2), Nurse Performance (Y), Work Environment (M1), and Super Leadership (X), have good discriminant validity.

3.5 Structural Model Evaluation (Inner Model)

Table 6. Structural model test results (direct effect)

Construct	β	t	p-value	95% CI	Decision
Super Leadership (X) Nurse Performance (Y)	-0.052	0.638	0.524	-0.315-(0.135)	Not Supported
Super Leadership (X) Work Engagement (M2)	0.646	13,018	0.000	0.541-0.734	Supported
Super Leadership (X) Environment Work (M1)	0.476	6,754	0.000	0.326-0.605	Supported
Work Environment (M1) Nurse Performance (Y)	-0.214	2,780	0.005	-0.425-(0.089)	Supported
Work Environment (M1) Work Engagement (M2)	0.244	4,275	0.000	0.130-0.355	Supported
Work Engagement (M2) Nurse Performance (Y)	0.799	4,244	0.000	0.353-0.898	Supported

3.6 Mediation Effect Analysis

Table 7. Structural model test results (indirect effect)

Construct	Indirect Effect	t	p	95% CI	Decision
Work Environment (M1) Work Engagement (M2) Nurse Performance (Y)	0.195	2,548	0.011	0.059-0.277	Supported
Super Leadership (X) Work Engagement (M2) Nurse Performance (Y)	0.516	3,759	0.000	0.216-0.610	Supported

Construct	Indirect Effect	t	p	95% CI	Decision
Super Leadership (X) Work Environment (M1) Nurse Performance (Y)	-0.102	2,311	0.021	-0.024-(-0.037)	Supported
Super Leadership (X) Work Environment (M1) Work Engagement (M2) Nurse Performance (Y)	0.093	2,292	0.022	0.026-0.141	Supported

Table 7 shows the results of the indirect effect test; all hypothesised mediation paths are proven to be significant and supported by the data. This is evidenced by the p-value <0.05 , the t-statistic value >1.96 , and the 95% confidence interval (Confidence Interval) that does not cross zero for all paths. Specifically, the strongest mediation path was found in the influence of super leadership on nurse performance through work engagement (indirect effect = 0.516; $p = 0.000$), which indicates that the role of super leadership is very effective in improving performance if it is done through increasing work engagement first. In addition, there is also a significant serial mediation effect where super leadership affects the work environment, which then increases work engagement, and ultimately leads to increased Nurse Performance (effect = 0.093; $p = 0.022$). A unique finding was also seen in the Super Leadership $\rightarrow$ Work Environment $\rightarrow$ Nurse Performance path, which showed a negative indirect effect (-0.102), indicating the existence of complex dynamics where improvements in the work environment without being accompanied by adequate work involvement do not necessarily directly boost performance positively in this model.

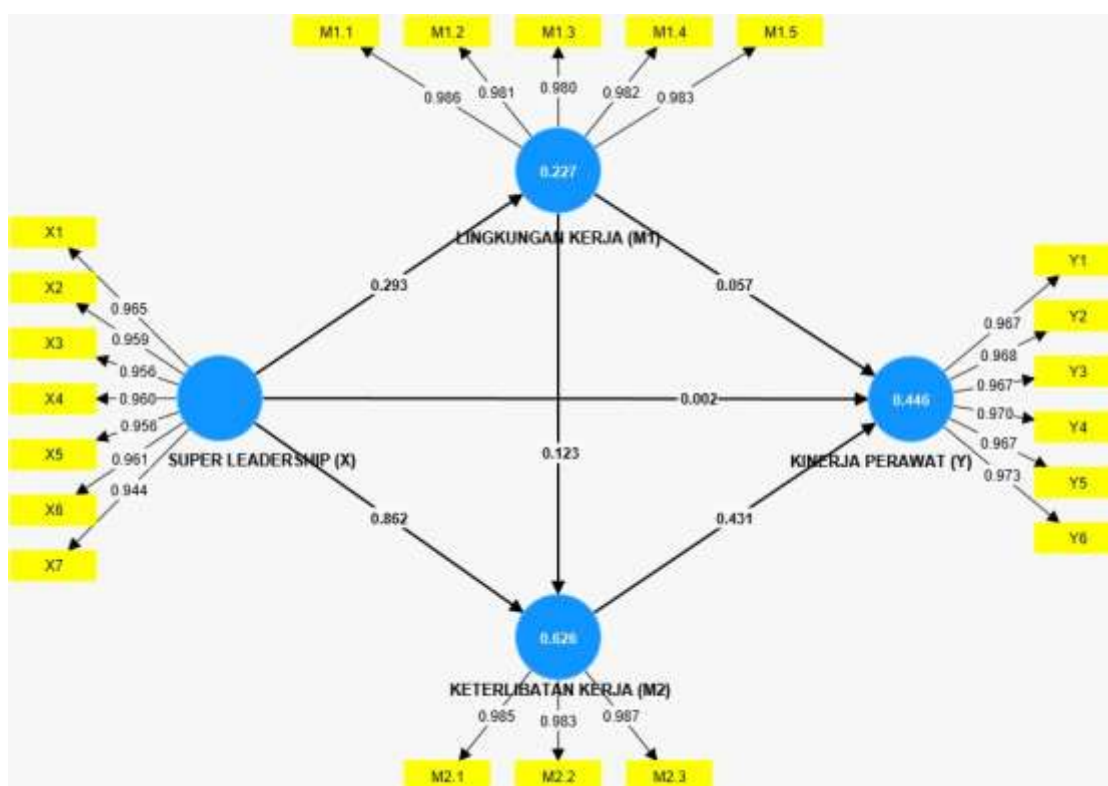


Figure 1. Results of the SEM-PLS structural model

The picture shows the results of the path diagram analysis (PLS-SEM), which tests the influence of Super Leadership (X) on Nurse Performance (Y) through two mediator variables, namely Environment Work (M1) and work Engagement (M2). Based

on the loading factor values on all indicators (X1-X7, M1.1-M1.5, M2.1-M2.3, Y1-Y6) are above 0.90. All research instruments have very strong indicator validity. In the structural model test, Super Leadership has a very strong direct influence on work Engagement (0.862) and a moderate influence on Work Environment (0.293), but the direct influence on nurse performance is classified as very weak (0.002). On the other hand, Work Involvement (M2) has a dominant direct contribution in increasing Nurse Performance of 0.431, much higher than the contribution of Work Environment of only 0.057. Overall, this model is able to explain the variance of the Nurse Performance variable (Y) by 44.6% ($R^2 = 0.446$), the variance of work engagement (M2) by 62.6% ($R^2 = 0.626$), and the variance of Work Environment (M1) by 22.7% ($R^2 = 0.227$).

3.7 Discussion

The demographic characteristics of the respondents in this study provide important insights into the profile of the nursing staff being the subject of the study. The predominance of female respondents reflects a general pattern in the nursing profession, where female nurses have historically and culturally chosen this career path more often than male nurses. The age distribution of the majority of respondents was in the middle adulthood range, indicating that the nursing staff studied were in a productive phase with relatively high emotional and professional maturity. This is in line with the work experience of the majority of respondents, which was classified as middle, indicating that most nurses have passed the initial orientation and adaptation phase, thus having sufficient work experience to provide objective assessments of leadership, the work environment, work engagement, and their own performance. The relatively balanced educational level between Diploma graduates and Nursing graduates also enriched the variety of perspectives in answering the research instrument, although the slightly higher proportion of Nurses may indicate a push for professionalisation of nursing towards higher education levels at the study site.

Evaluation of the measurement model shows that all instruments used to measure the constructs of super leadership, work environment, work engagement, and nurse performance have excellent psychometric qualities. High convergent validity values indicate that each indicator consistently represents the latent construct, while very high reliability indicates that the instrument is stable and reliable when reused on similar populations. Measurement quality is an important foundation for strengthening confidence in the results of subsequent structural model testing, because minimal measurement error will produce more accurate and methodologically accountable estimates of relationships between variables.

Discriminant validity testing also confirmed that the four research constructs are conceptually distinct entities, although they are theoretically interrelated within the model framework. Each construct exhibits greater variance in its own indicators compared to the other constructs, a condition ensuring that Super Leadership does not overlap substantially with Work Environment, Work Engagement, or Nurse Performance. This condition confirms that the effects found in the hypothesis testing reflect causal relationships between different constructs, not due to conceptual differences or measurement redundancy between variables.

[22] in their study in healthcare settings proved that convergent validity assessments through Average Variance Extracted (AVE) above 0.50 and Composite Reliability (CR) above 0.70 indicate that each indicator consistently and stably represents its latent construct. [23] further emphasised that high reliability and convergent validity are met, ensuring that measurement error can be minimised. This is a crucial methodological foundation because estimating the relationship between variables, such as the influence of Super Leadership on the Work Environment and Nurses' Work Engagement, will be accurate and accountable if the measurement model has been proven reliable. [10] in their study of nurses showed that positive leadership behaviour (engaging leadership) plays a crucial role in shaping nurses' perceptions of the work environment by increasing work resources and reducing work demands. A conducive work environment triggers intrinsic motivation and work engagement, ultimately leading to optimal nurse well-being and performance.

The coefficient of determination for each endogenous variable provides an overview of the model's strength in explaining the phenomena studied. Nurses' work engagement is strongly explained by the predictor variables, indicating that leadership and work environment factors play a fairly dominant role in shaping the extent of nurses' enthusiasm, dedication, and appreciation for their work. Meanwhile, nurses' performance is explained at a moderate level by the model, indicating that although leadership, work environment, and work engagement contribute significantly, there is still a proportion of performance variance influenced by factors outside the model, such as individual characteristics, reward systems, or organisational policies not measured in the study. Meanwhile, the work environment is only weakly explained by super leadership, suggesting that the

formation of a conducive work environment does not solely depend on leadership style, but is influenced by structural factors and other institutional policies outside the scope of the study.

In a way, theoretically, Super leadership developed by [9] emphasises the empowerment process. Employee for lead self-leadership through behavioural and cognitive strategies, such as self-observation, self-goal setting, self-reward, and constructive self-talk. This approach is designed to increase individual autonomy and responsibility; however, its direct effect on organisational performance is often weak because its influence operates more through intervening psychological variables, such as work motivation, work engagement, and self-efficacy. This is in line with the perspectives of Work Demands-Resources (JD-R) Theory and Social Cognitive Theory, which state that empowering leadership tends to influence performance indirectly by increasing individual psychological resources.

The findings from the structural model testing did not reveal a significant direct effect of super leadership on nurse performance. this finding confirms that the application of a self-leadership style or super leadership alone does not automatically drive improved nurse performance if it is not bridged by certain psychological mechanisms. A leader encouraging subordinates to lead themselves through behavioural modelling, goal setting, and reinforcing positive mindsets does not necessarily result in instant performance improvements, but requires a further internalisation process within the nurses themselves before it has an impact on measurable work behaviour. This non-significant finding is supported by several previous studies that found that self-leadership has a stronger influence on nurse performance through mediators such as self-efficacy and work engagement, rather than directly [24]

The findings from both studies underscore that specific leadership styles can significantly enhance nurses' work performance through distinct psychological mechanisms. [25] revealed that ethical leadership not only directly predicts nurses' work performance but also indirectly improves it through the mediating role of self-compassion, which accounts for 26.62% of the total effect. Similarly, [26] demonstrated that paternalistic leadership positively impacts nurses' performance, mediated by self-efficacy, with this mediating effect being notably stronger in high power-distance cultures. Collectively, these studies affirm that leadership interventions integrating moral support and caring authority, combined with the reinforcement of nurses' internal psychological resources, are crucial for optimising their performance and well-being in clinical environments.

This finding is consistent with the basic concept of Super Leadership, emphasising self-empowerment, where leaders act as facilitators helping subordinates develop their own leadership capacity. When nurses feel empowered, given role models, and encouraged to set goals and reward their own achievements, psychologically, they will experience higher vigour, dedication, and absorption in their work. In addition, Super Leadership has been proven to have a significant influence on improving the Work Environment, indicating that a leadership style that supports the independence of subordinates also encourages the creation of a more organised work atmosphere, both in terms of spatial layout, completeness of facilities, interpersonal relationships, and occupational safety aspects.

[27] reported that nursing leadership contributes up to 46% variance in nursing practice behaviours. [28] study of nurses in a tertiary hospital in China revealed that transformational leadership was positively correlated with innovation performance, with innovative self-efficacy acting as a significant mediator in this relationship (accounting for 27.8% of the total effect). This reinforces the conclusion that leadership development programs not only enhance leadership self-efficacy and structural empowerment, but also directly promote nurses' clinical performance and innovation capacity in healthcare settings. This contradiction can be explained by differences in cultural and organisational contexts. In Indonesia's collectivist and hierarchical culture, the implementation of super leadership, which emphasises self-direction, may be less effective without strong structural support, such as organisational policies, adequate work facilities, and a clear reward system. Furthermore, differences in measurement instruments and sample characteristics (e.g., nurses' education level and work experience) may also influence the results.

The results of the test of the negative and significant influence of the Work Environment on Nurse Performance directly, there is a suppressive effect in the mediation model, where the influence of the Work Environment on Performance is actually channeled positively through Work Engagement, while the direct path without going through a mediator captures other dynamics, namely the tendency of nurses to become too comfortable or less motivated when work facilities are very adequate without being accompanied by strengthening other psychological aspects of work. On the other hand, the Work Environment

has a positive and significant influence on work engagement, indicating that a conducive work atmosphere remains an important supporting factor for the growth of nurses' enthusiasm and dedication to work.

[29] study on servant leadership showed that empowering leadership has a significant positive impact on nurses' work climate and work attitudes. Similarly, other studies examining empowering leadership and self-leadership have found a strong positive relationship between these leadership styles and perceptions of the work environment among nursing professionals [30,31]. Empowerment-oriented leadership has been shown to increase feelings of autonomy, supervisor support, and access to the information and resources nurses need to carry out their duties.

The study by [32] demonstrates a significant positive correlation ($r = 0.367$, $p < 0.001$) between nurse managers' transformational leadership and nurses' work engagement, with dedication scoring the highest (mean 4.14) and providing feedback and rewards identified as the managers' weakest area (mean 2.64). These findings indicate that while nurses possess a strong commitment to their duties, their work engagement can be further optimized if nurse managers enhance their interpersonal skills in delivering appreciation. Research by [33] demonstrated that self-leadership significantly increases employee normative commitment and performance through the strong mediation of work engagement. Based on social cognitive theory and intrinsic motivation, employees' ability to lead themselves will increase their engagement with their work. This engagement is a crucial bridge in fostering a sense of responsibility for organisational retention and triggering a surge in optimal performance.

The construct that shows the strongest and most consistent direct influence on Nurse Performance is Work Engagement. This finding confirms the central position of work engagement as a psychological bridge that transforms leadership potential and work environment conditions into real and measurable work behaviours. Nurses with high levels of vigour, dedication, and absorption in their work tend to demonstrate better service quality, more optimal work quantity, better punctuality, higher initiative, more solid teamwork, and contribute to better patient satisfaction. This finding strengthens organisational investment in building work engagement as a more effective strategy to boost performance than just focusing on improving leadership style or the physical environment alone.

Studies by [10,34] show that a positive perceived work environment significantly increases work engagement and reduces burnout in nurses. Research in Indonesia and internationally has also found that aspects of the work environment, such as organisational support, interprofessional relationships, and workload balance, are strong predictors of work engagement [35,36].

These findings are supported by several studies in Indonesia showing that aspects of the work environment often reflect excessive workload and are negatively correlated with nurse performance [37,38]. Contrary to these results, many international studies in countries with better resources report the work environment as a positive mediator between leadership and performance [34]. This difference illustrates the importance of the organisational context and the level of resource availability in determining the direction of mediation. These results imply that efforts to implement super leadership to improve the work environment should not be undertaken in isolation. Leadership interventions must be accompanied by more fundamental structural measures, including increasing the number of human resources, redistributing the workload, improving physical facilities, and improving shift management systems. Without comprehensive structural interventions, super leadership has the potential to produce undesirable indirect effects on nurse performance. This negative mediation effect is expected to be stronger in units with extreme workloads, such as the Emergency Department (ER), Intensive Care Unit (ICU), or inpatient wards with high occupancy rates. Conversely, in units with more manageable workloads or in hospitals with better resources, the direction of this mediation is likely to shift to positive.

The mediation effect analysis reinforces the idea that the role of Work Engagement as a mediator is a key mechanism explaining how Super Leadership and the Work Environment influence Nurse Performance. The most dominant mediation pathway was found in the influence of Super Leadership on Nurse Performance through Work Engagement, indicating that the benefits of implementing new self-leadership will be optimally felt when it is able to foster nurses' enthusiasm and psychological attachment to their work first.

The nurses' work environment plays a crucial role in shaping their professional quality of life and work engagement in hospitals. Study findings indicate that a conducive practice environment, particularly one characterized by strong collaborative relationships between nurses and physicians, has been shown to significantly increase compassion satisfaction while reducing burnout and secondary traumatic stress in nurses [39]. This condition aligns with the principle that positive perceived

organisational support by nursing staff and firm self-efficacy beliefs simultaneously enhance their emotional bond and work dedication [40].

Various leadership styles in nursing have been shown to significantly influence nurses' work outcomes and well-being through specific mediating mechanisms. Collaborative leadership effectively improves nurses' productive work performance by encouraging innovative behaviour, which is crucial for organisational competitiveness and sustainability amidst the dynamics of the healthcare environment [5]. Conversely, health-promoting leadership provides an indirect protective effect against presenteeism by reducing workload, although its effectiveness may be weakened if the leader themselves face high performance pressure [41]. Furthermore, work engagement has also emerged as a crucial mediator bridging the influence of leadership on clinical outcomes; this is evident in the role of work engagement in mediating the relationship between leadership and work performance in ICU nurses [42] as well as the significant mediation of work engagement on the relationship between clinical leadership and nursing care quality [43]. Overall, this synthesis confirms that the implementation of adaptive leadership styles, whether collaborative, health-oriented, or clinical, is highly dependent on optimising the psychological engagement and innovative behaviour of nurses to achieve productive performance, well-being, and quality of health services.

Also found a path serial mediation where super leadership influences environment work, then increases work engagement, which leads to increasing nurse performance, which can work through a series of mechanisms, psychological and structural, in a way simultaneously. However, it was found effect of mediation negative effect on the super leadership path through environment work direct towards nursing performance return confirm existence complexity connection that cannot be simplified become purely linear pattern, repairing the environment work needs to always be accompanied by strengthening involvement in work, so that the impact on performance can be realised in a positive way.

3.8 Practical Implications

Practically, this research provides strategic messages for hospital management and nursing unit leaders. First, the focus of performance development should not stop at improving physical infrastructure or the work environment alone. While adequate facilities are important, such investments will not yield optimal returns if not accompanied by the development of a supportive psychological climate. Second, leadership training for ward heads or nursing managers must shift from an instructional style to Super Leadership. Leaders need to be trained to be role models who teach staff how to set personal goals, self-reward, and manage their own thoughts. When nurses are able to lead themselves, they will experience a significant increase in work engagement, the primary fuel for high performance. Third, interventions to improve nurse performance must target both the heart and mind (work engagement). Programs aimed at increasing vigour, dedication, and absorption, such as recognition for achievement, granting autonomy in nursing care, and creating meaning in work, will be more effective in boosting service quality than simply adding medical equipment or improving the layout.

3.9 Strengths and Limitations

The strength of this study lies in the robustness of the measurement model, in which all instruments were valid and reliable for capturing abstract constructs such as Super Leadership and Work Engagement in the nursing context. The use of comprehensive path analysis (including serial mediation) enabled researchers to map the mechanisms between leadership and performance, providing richer insights than simple correlational studies. Furthermore, the homogeneity of respondents' work-experience characteristics reduced the variance in noise due to differences in baseline competency levels.

The limitations of this study include its cross-sectional design, which captures relationships only at a single point in time and thus does not fully confirm causality. Performance and work environment measurements were based on self-reported perceptions, potentially introducing subjectivity bias. While the research model was able to explain performance variance quite well, it is possible that other variables outside the model, such as organizational culture, workload, or compensation, play a significant role but have not been accounted for.

3.10 Recommendations for Future Research

Used by a longitudinal design for use test stability connection causal intervariable from time to time, expanding population research on various types of facility health, as well as exploring other moderator variables such as commitment organisation or climate, potential psychological strengthen and weaken connection between leadership, environment work, work engagement, and performance nurse.

4. CONCLUSION

This study examined the effect of Super Leadership on Nurse Performance through the mediating role of Work Environment and Work Engagement among nursing staff, and aimed to examine the direct and indirect pathways linking these constructs in the structural model. The findings indicated that Super Leadership did not exert a significant direct influence on Nurse Performance, but instead exerted a strong and significant influence on both Work Engagement and Work Environment, highlighting that empowering self-leadership translates into performance outcomes primarily through psychological and contextual mechanisms rather than direct pathways. Work Engagement emerged as the strongest and most consistent direct predictor of Nurse Performance, while Work Environment showed a significant negative direct influence on performance despite contributing positively to engagement, indicating a complex dynamic of emphasis that constitutes a novel and context-specific contribution of this study. These results underscore the theoretical importance of psychological engagement as a central mediating mechanism in nursing leadership models, suggesting that healthcare institutions should prioritise strategies to foster morale, dedication, and absorption among nurses, such as reward programs, meaningful work design, and autonomy-supportive supervision, rather than relying solely on leadership style or physical workplace improvements to improve performance.

Future research focusing on using longitudinal designs to confirm causal relationships, expanding the study population across healthcare institutions, and exploring additional moderating variables such as organisational commitment or psychological climate, could potentially enhance our understanding of how leadership translates into nursing performance and inform evidence-based human resource policy and nursing management practice.

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AUTHOR CONTRIBUTIONS

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CONFLICT OF INTEREST

A conflict-of-interest declaration was not stated in the source manuscript. The authors should confirm and complete this statement before submission.

ETHICS STATEMENT

Ethical clearance was obtained from the Health Research Ethics Committee. Informed consent was obtained before data collection, confidentiality was maintained, and participation was voluntary. The committee name, approval number, and approval date were not provided in the source manuscript and should be added before submission.

DATA AVAILABILITY STATEMENT

A data-availability statement was not provided in the source manuscript. Please specify whether the de-identified data are available from the corresponding author, a repository, or subject to institutional and ethical restrictions.

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