

Clinical Leadership and Job Performance Among Doctors in Malaysian University Hospitals: A Simulation Study of the Mediating Role of Professional Work Engagement

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ABSTRACT: University hospital doctors perform simultaneous responsibilities in patient care, medical education, research and institutional administration. Effective clinical leadership may provide essential professional resources that strengthen doctors' engagement and performance across these responsibilities. This simulation study demonstrates how Partial Least Squares Structural Equation Modelling can be applied to examine the relationship between clinical leadership, professional work engagement and job performance among doctors in Malaysian university hospitals. A synthetic dataset representing 300 hypothetical doctors from four Malaysian university hospitals was generated using a fixed random seed. Clinical leadership was operationalised through professional support, collaborative culture and clarity of clinical goals. Professional work engagement comprised vigour, dedication and absorption, whereas job performance covered clinical, teaching and research performance. The simulated data were analysed using descriptive statistics, reliability analysis, convergent and discriminant validity assessments, standardised structural-path analysis and non-parametric bootstrapping with 5,000 resamples. All constructs demonstrated acceptable reliability, with Cronbach's alpha values ranging from 0.822 to 0.925, composite reliability between 0.882 and 0.936, and average variance extracted between 0.552 and 0.685. All HTMT values were below 0.90. Professional support ($\beta = 0.325$, $p < 0.001$), collaborative culture ($\beta = 0.276$, $p < 0.001$), and clarity of clinical goals ($\beta = 0.149$, $p = 0.006$) positively predicted professional work engagement. Clinical leadership ($\beta = 0.251$, $p < 0.001$) and professional work engagement ($\beta = 0.465$, $p < 0.001$) positively predicted job performance. The simulated indirect effect of clinical leadership on job performance through professional work engagement was significant ($\beta = 0.262$, 95% CI [0.197, 0.331]). The model explained 33.2% of the variance in professional work engagement and 41.1% of the variance in job performance. The simulation illustrates a theoretically plausible Job Demands-Resources model but does not constitute evidence collected from actual doctors.

KEYWORDS - clinical leadership; professional work engagement; job performance; university hospitals; doctors; Malaysia; PLS-SEM; simulation study

I. INTRODUCTION

University hospitals have a distinctive function within national healthcare systems. Unlike conventional healthcare institutions, university hospitals integrate tertiary patient care, undergraduate and postgraduate medical education, clinical research, professional training and knowledge development. Doctors in these institutions are therefore required to undertake responsibilities extending considerably beyond direct clinical services.

In addition to diagnosing and treating patients, university hospital doctors may teach medical students, supervise house officers and medical officers, participate in research, produce scholarly publications, contribute to quality-improvement programmes and undertake institutional administration. These responsibilities can create competing demands on doctors' time, attention and psychological resources. High clinical workloads may reduce the time available for teaching and research, while academic performance requirements may intensify pressure experienced during clinical practice.

Accordingly, the performance of university hospital doctors should be conceptualised as multidimensional. Clinical productivity or patient-management responsibilities alone cannot adequately represent their complete institutional contribution. Performance should incorporate clinical service, teaching and supervision, and research or scholarly productivity.

Clinical leadership may be an important resource for doctors managing these responsibilities. Clinical leadership concerns the capacity of healthcare professionals and medical managers to influence clinical practice, establish shared priorities, coordinate multidisciplinary work and support improvements in patient care. Effective clinical leaders provide professional guidance, encourage collaboration and communicate clear clinical objectives.

Professional support may help doctors resolve workplace problems, access resources and develop their competencies. A collaborative culture may strengthen communication, teamwork and knowledge sharing across professional disciplines. Clarity of clinical goals may reduce uncertainty and enable doctors to prioritise their clinical and academic responsibilities.

However, leadership may not influence job performance exclusively through formal decisions, policies or resource allocation. Its influence may also operate through doctors' psychological connection with their work. Professional work engagement provides a theoretically important explanation of this mechanism.

Work engagement is a positive work-related condition characterised by vigour, dedication and absorption. Vigour represents energy, persistence and psychological resilience. Dedication concerns professional meaning, enthusiasm, inspiration and pride. Absorption reflects deep concentration and involvement in work.

Engaged doctors may be more willing to invest sustained effort, remain attentive during demanding clinical tasks, contribute to teaching and supervision, and participate in research and organisational development. Thus, professional work engagement may transmit part of the relationship between clinical leadership and job performance.

Previous studies have linked supportive, authentic and transformational leadership with engagement and performance in healthcare settings. Nevertheless, much of the existing literature has focused on nurses, general healthcare employees or non-academic hospitals. Evidence specifically examining doctors who perform clinical, educational and research responsibilities in Malaysian university hospitals remains comparatively limited.

The present simulation study demonstrates how a model connecting clinical leadership, professional work engagement and multidimensional job performance can be examined. The study is grounded in Job Demands-Resources Theory and employs a simulated sample of 300 hypothetical doctors from four Malaysian university hospitals.

The objectives are:

1. To assess the simulated relationship between clinical leadership and doctors' job performance.
2. To examine the simulated relationships between professional support, collaborative culture, clarity of clinical goals and professional work engagement.
3. To determine the simulated relationship between professional work engagement and doctors' job performance.
4. To evaluate the simulated indirect relationship between clinical leadership and job performance through professional work engagement.

II. LITERATURE REVIEW AND HYPOTHESES

2.1 Job Demands-Resources Theory

Job Demands-Resources Theory categorises work characteristics into job demands and job resources. Job demands are aspects of work that require sustained physical, cognitive or emotional effort. Examples include excessive workloads, time pressure, role conflict, emotional demands and administrative burden. Job resources assist employees in attaining work goals, reducing the costs of job demands and supporting professional growth. Resources may include supervisory support, autonomy, feedback, teamwork, learning opportunities and goal clarity. Job Demands-Resources Theory proposes two broad processes. The health-impairment process explains how excessive demands may produce exhaustion and adverse outcomes. The motivational process explains how resources promote engagement and positive performance outcomes (Bakker & Demerouti, 2017). In university hospitals, professional support, collaborative culture and goal clarity can operate as job resources. These resources may help doctors manage clinical-academic demands and strengthen their professional engagement. Greater engagement may subsequently contribute to better performance.

2.2 Clinical Leadership and Job Performance

Clinical leadership involves influencing practices and professional behaviours to improve healthcare delivery. Effective clinical leaders create direction, coordinate teams, support professional development and facilitate evidence-based decisions. Leadership may directly improve performance by reducing role ambiguity and ensuring that employees have sufficient information and resources. Clinical leaders can also align the different objectives of healthcare service, education and research. Professional support enables doctors to access advice, mentoring, feedback and resources. Collaborative culture facilitates communication and coordinated problem-solving. Goal clarity assists doctors in understanding expected standards and determining how responsibilities contribute to departmental and institutional priorities.

Therefore:

H1: Clinical leadership has a positive and statistically significant relationship with doctors' job performance.

2.3 Professional Support and Work Engagement

Professional support communicates that employees' contributions and professional development are valued. Doctors who receive adequate support may perceive demanding responsibilities as more manageable.

Support from clinical leaders can include guidance, mentoring, developmental feedback, access to resources and assistance in resolving clinical or administrative problems. These resources may strengthen psychological safety and allow doctors to invest greater energy in their professional work.

Therefore:

H2a: Professional support has a positive and statistically significant relationship with professional work engagement.

2.4 Collaborative Culture and Work Engagement

Doctors in university hospitals work with specialists, nurses, pharmacists, allied health professionals, administrators, academics and students. Effective performance consequently depends on cooperation across professional and departmental boundaries.

A collaborative culture promotes communication, mutual assistance, knowledge sharing and coordinated decision-making. It may reduce professional isolation and interpersonal conflict while strengthening collective efficacy.

Therefore:

H2b: Collaborative culture has a positive and statistically significant relationship with professional work engagement.

2.5 Clarity of Clinical Goals and Work Engagement

Goal clarity refers to the extent to which leaders communicate understandable objectives, standards, responsibilities and priorities. Unclear or conflicting goals may produce role ambiguity and inefficient allocation of professional effort.

Clear clinical and institutional goals allow doctors to determine which responsibilities require priority and how their work contributes to organisational outcomes. Goal clarity may consequently strengthen professional meaning, dedication and concentration.

Therefore:

H2c: Clarity of clinical goals has a positive and statistically significant relationship with professional work engagement.

2.6 Work Engagement and Job Performance

Work engagement represents an active motivational state rather than merely passive satisfaction. Engaged professionals demonstrate energy, persistence, enthusiasm and concentration. Christian et al. (2011) identified positive relationships between work engagement and task and contextual performance. In university hospitals, engaged doctors may perform clinical responsibilities more attentively, contribute more effectively to teaching and demonstrate greater participation in research.

Therefore:

H3: Professional work engagement has a positive and statistically significant relationship with doctors' job performance.

2.7 Mediating Role of Professional Work Engagement

Job Demands-Resources Theory proposes that job resources contribute to positive outcomes partly through motivational mechanisms. Clinical leadership may create resources through support, collaboration and clear direction. These resources may strengthen professional engagement, which subsequently promotes performance.

Therefore:

H4: Professional work engagement significantly mediates the relationship between clinical leadership and doctors' job performance.

III. METHODOLOGY

3.1 Research Design

This study was designed as a methodological simulation of an explanatory cross-sectional survey. No human participants were recruited, and no questionnaire was distributed to actual doctors. A synthetic dataset was generated to demonstrate the analytical procedures that could be used in a future empirical study. The unit represented in the dataset was a hypothetical university hospital doctor. The synthetic data were generated using a fixed random seed of 20260909 to support reproducibility. Relationships among latent variables were programmed to be positive but imperfect, thereby producing realistic variation in item responses.

3.2 Simulated Population and Sample

The dataset comprised 300 hypothetical doctors allocated equally across four Malaysian university hospitals:

1. Hospital Canselor Tuanku Muhriz, Universiti Kebangsaan Malaysia
2. Hospital Al-Sultan Abdullah, Universiti Teknologi MARA
3. Hospital Universiti Sains Malaysia
4. Universiti Malaya Medical Centre.

Each hospital contributed 75 synthetic observations. The demographic variables included gender, age group, professional grade, employment tenure and weekly working hours.

The hospital names were used exclusively as simulation labels. The dataset does not describe employees or conditions within those institutions.

3.3 Research Instrument

The simulated questionnaire contained demographic variables and 33 measurement items. Each measurement item used a five-point Likert scale ranging from 1, "strongly disagree," to 5, "strongly agree."

Table 1. Structure of the simulated instrument

Section	Construct	Dimensions	Items
A	Demographic profile	Hospital, gender, age, grade, tenure and working hours	6
B	Clinical leadership	Professional support	4
B	Clinical leadership	Collaborative culture	4
B	Clinical leadership	Clarity of clinical goals	4

C	Professional work engagement	Vigour, dedication and absorption	9
D	Job performance	Clinical, teaching and research performance	12
Total measurement items			33

Clinical leadership was modelled as a higher-level construct composed of professional support, collaborative culture and goal clarity. Professional work engagement was represented by vigour, dedication and absorption. Job performance incorporated clinical, teaching and research responsibilities.

The item wording was newly drafted for the simulation and did not reproduce a licensed proprietary instrument.

3.4 Data-Generation Procedure

A common clinical-leadership factor was generated from a standard normal distribution. Professional support, collaborative culture and goal clarity were generated as related but distinct dimensions influenced by the common leadership factor and dimension-specific random variation. Professional work engagement was generated as a function of the three leadership dimensions plus random disturbance. Job performance was generated as a function of aggregate clinical leadership and professional work engagement plus random disturbance. Continuous simulated item scores were converted into ordinal values from 1 to 5. Random error was introduced into every item to prevent perfect measurement or structural relationships.

3.5 Data Analysis

Analysis was undertaken in five stages:

1. Respondent-profile and descriptive analysis
2. Internal-consistency assessment
3. Convergent and discriminant validity assessment
4. Structural-path analysis
5. Bootstrapped mediation analysis.

Internal consistency was assessed using Cronbach's alpha, rho_A and composite reliability. Values of at least 0.70 were considered acceptable.

Convergent validity was evaluated using indicator loadings and average variance extracted. Loadings around 0.708 or above were preferred, although values below this level were retained when the overall construct demonstrated adequate reliability and AVE. AVE values of at least 0.50 indicated acceptable convergent validity.

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio. HTMT values below 0.90 were considered acceptable.

Standardised path coefficients were estimated from construct-composite scores. The mediation effect was evaluated using 5,000 non-parametric bootstrap samples. An indirect effect was considered significant when its 95% confidence interval did not contain zero.

Collinearity was assessed using variance inflation factors. Effect sizes were calculated by comparing the explained variance of the complete structural equation with the explained variance obtained after removing each predictor.

IV. RESULTS

4.1 Simulated Respondent Profile

The dataset contained 300 complete synthetic observations. Each hospital accounted for 25.0% of the sample. Male doctors represented 57.7%, while female doctors represented 42.3%. The largest age category was 35–44 years, accounting for 38.3% of the simulated sample, followed by 25–34 years at 32.3%. Medical officers represented the largest professional group at 38.7%.

Table 4. Respondent Profile

Characteristic	Category	Frequency (n)	Percentage (%)
Hospital	HCTM-UKM	75	25.0
	HASA-UiTM	75	25.0
	HUSM	75	25.0
	UMMC	75	25.0
Gender	Male	173	57.7
	Female	127	42.3
Age	25–34 years	97	32.3
	35–44 years	115	38.3
	45–54 years	70	23.3
	55 years and above	18	6.0
Professional grade	Medical officer	116	38.7
	Specialist	79	26.3
	Consultant	60	20.0
	Academic clinician	45	15.0
Total		300	100.0

4.2 Descriptive Statistics

Mean values were close to the midpoint of the five-point scale. Collaborative culture obtained the highest mean among the leadership dimensions ($M = 3.018$, $SD = 1.034$), followed by goal clarity ($M = 2.993$, $SD = 1.092$) and professional support ($M = 2.969$, $SD = 1.062$).

Aggregate clinical leadership recorded a mean of 2.994. Professional work engagement obtained a mean of 3.003, while job performance obtained a mean of 2.929.

Table 3. Descriptive statistics

Construct	N	Mean	SD	Minimum	Maximum
Professional support	300	2.969	1.062	1.000	5.000
Collaborative culture	300	3.018	1.034	1.000	5.000
Goal clarity	300	2.993	1.092	1.000	5.000
Clinical leadership	300	2.994	0.805	1.000	4.833
Professional work engagement	300	3.003	0.981	1.000	5.000
Job performance	300	2.929	0.966	1.000	5.000

4.3 Correlation Analysis

All principal constructs demonstrated positive correlations. Clinical leadership was positively correlated with professional work engagement ($r = 0.566$) and job performance ($r = 0.514$). Professional work engagement demonstrated the strongest correlation with job performance ($r = 0.607$).

Table 4. Correlation matrix

Construct	PS	CC	GC	CL	WE	JP
Professional support (PS)	1.000					
Collaborative culture (CC)	0.346	1.000				
Goal clarity (GC)	0.343	0.392	1.000			
Clinical leadership (CL)	0.743	0.758	0.771	1.000		
Work engagement (WE)	0.472	0.447	0.369	0.566	1.000	
Job performance (JP)	0.318	0.447	0.404	0.514	0.607	1.00

4.4 Measurement-Model Assessment

Cronbach's alpha values ranged from 0.822 to 0.925, exceeding the recommended value of 0.70. Composite reliability ranged from 0.882 to 0.936. AVE values ranged from 0.552 to 0.685, exceeding the threshold of 0.50. These results indicated acceptable internal consistency and convergent validity in the simulated measurement model.

Two constructs contained minimum indicator loadings slightly below 0.708. Work engagement had a minimum loading of 0.695 and job performance had a minimum loading of 0.654. These items were retained because their constructs demonstrated adequate composite reliability and AVE and because automatic deletion could reduce content coverage.

Table 5. Measurement-model results

Construct	Items	Loading range	Alpha	rho_A	CR	AVE	Decision
Professional support	4	0.805–0.854	0.847	0.853	0.897	0.685	Acceptable
Collaborative culture	4	0.787–0.830	0.822	0.828	0.882	0.652	Acceptable
Goal clarity	4	0.797–0.845	0.839	0.845	0.892	0.674	Acceptable
Work engagement	9	0.695–0.808	0.916	0.922	0.930	0.598	Acceptable
Job performance	12	0.654–0.817	0.925	0.931	0.936	0.552	Acceptable

4.5 Discriminant Validity

All HTMT values were below 0.90. The largest value was 0.660 between professional work engagement and job performance.

The results therefore indicated that the simulated constructs possessed adequate discriminant validity. Table 6. HTMT results

Construct pair	HTMT	Decision
Professional support – collaborative culture	0.415	Acceptable
Professional support – goal clarity	0.406	Acceptable
Professional support – work engagement	0.536	Acceptable
Professional support – job performance	0.360	Acceptable
Collaborative culture – goal clarity	0.472	Acceptable
Collaborative culture – work engagement	0.516	Acceptable
Collaborative culture – job performance	0.512	Acceptable
Goal clarity – work engagement	0.420	Acceptable
Goal clarity – job performance	0.459	Acceptable
Work engagement – job performance	0.660	Acceptable

4.6 Collinearity Assessment

Variance inflation factors for professional support, collaborative culture and goal clarity ranged from 1.205 to

1.257. The VIF values for clinical leadership and professional work engagement were both 1.470.

All VIF values were substantially below the conservative threshold of 3.3, indicating that problematic structural collinearity was absent from the simulated model.

4.7 Structural-Model Results

Professional support positively predicted professional work engagement ($\beta = 0.325$, $t = 6.235$, $p < 0.001$). Therefore, H2a was supported.

Collaborative culture positively predicted professional work engagement ($\beta = 0.276$, $t = 5.180$, $p < 0.001$), supporting H2b.

Goal clarity also positively predicted professional work engagement, although the relationship was smaller (β

$= 0.149$, $t = 2.796$, $p = 0.006$). H2c was supported.

Clinical leadership demonstrated a significant positive direct relationship with job performance ($\beta = 0.251$, $t = 4.655$, $p < 0.001$), supporting H1.

Professional work engagement demonstrated the largest direct relationship with job performance ($\beta = 0.465$, $t = 8.605$, $p < 0.001$), supporting H3. Table 7. Structural-path results

Hypothesis	Relationship	β	SE	t	p	95% CI	f ²	Decision
H1	Clinical leadership → job performance	0.251	0.054	4.655	<0.001	[0.145, 0.358]	0.073	Supported
H2a	Professional support → work engagement	0.325	0.052	6.235	<0.001	[0.223, 0.428]	0.131	Supported
H2b	Collaborative culture → work engagement	0.276	0.053	5.180	<0.001	[0.171, 0.381]	0.091	Supported
H2c	Goal clarity → work engagement	0.149	0.053	2.796	0.006	[0.044, 0.254]	0.026	Supported
H3	Work engagement → job performance	0.465	0.054	8.605	<0.001	[0.358, 0.571]	0.249	Supported

The f² results indicated that work engagement had a medium effect on job performance. Professional support approached a medium effect on work engagement. Collaborative culture and clinical leadership demonstrated small effects, while goal clarity had a small effect.

4.8 Explanatory Power

Professional support, collaborative culture and goal clarity explained 33.2% of the variance in professional work engagement. The adjusted R² was 0.325.

Clinical leadership and professional work engagement explained 41.1% of the variance in job performance. The adjusted R² was 0.407.

Table 8. Model explanatory power

Endogenous construct	R ²	Adjusted R ²	Interpretation
Professional work engagement	0.332	0.325	Moderate
Job performance	0.411	0.407	Moderate

4.9 Mediation Analysis

The simulated indirect effect of clinical leadership on job performance through professional work engagement was 0.262. The bootstrap confidence interval ranged from 0.197 to 0.331 and did not include zero. The direct effect remained significant at 0.251. The direct and indirect effects were positive and statistically significant, indicating complementary partial mediation.

The total simulated effect of clinical leadership on job performance was 0.513. Approximately 51.0% of the total effect was transmitted through professional work engagement:

$$\text{Mediated proportion} = \frac{0.262}{0.513} \times 100 = 51.0\%.$$

Therefore, H4 was supported.

Table 9. Mediation results

Effect	β	Bootstrap SE	95% CI	Decision
Direct effect	0.251	0.054	[0.145, 0.358]	Significant
Indirect effect through engagement	0.262	0.034	[0.197, 0.331]	Significant
Total effect	0.513	—	—	Positive
Mediation proportion	51.0%	—	—	Complementary partial mediation

4.10 Summary of Hypothesis Testing Table 10. Hypothesis-testing summary

Hypothesis	Statement	Decision
H1	Clinical leadership positively predicts job performance	Supported
H2a	Professional support positively predicts work engagement	Supported
H2b	Collaborative culture positively predicts work engagement	Supported
H2c	Goal clarity positively predicts work engagement	Supported
H3	Work engagement positively predicts job performance	Supported
H4	Work engagement mediates the leadership–performance relationship	Supported

V. DISCUSSION

The simulation demonstrated a theoretically coherent pattern in which clinical leadership and professional work engagement were positively related to doctors' job performance. All specified hypotheses were supported within the generated dataset. Professional support demonstrated the largest relationship with engagement among the three leadership dimensions. This suggests that access to guidance, feedback, resources and professional-development opportunities could be particularly important in maintaining doctors' energy and dedication. Collaborative culture also demonstrated a significant relationship with engagement. University hospital doctors perform interdependent work requiring communication with multiple professional and academic groups. A collaborative environment may reduce isolation, distribute responsibility and make complex work more manageable.

Goal clarity had a statistically significant but smaller relationship with engagement. Clear objectives may reduce ambiguity, but clarity alone may be insufficient when doctors do not receive adequate support or experience productive collaboration. Goal communication may therefore be more effective when accompanied by practical resources and supportive relationships. Professional work engagement demonstrated a stronger direct relationship with job performance than clinical leadership. This result is consistent with the motivational assumptions of Job Demands-Resources Theory. Leadership creates enabling conditions, whereas engagement represents the proximal state through which doctors invest energy and concentration in their work.

The mediation analysis indicated that professional work engagement transmitted approximately 51% of the total simulated relationship between leadership and performance. This pattern implies that leadership may influence performance through both motivational and operational mechanisms. The direct pathway may represent coordination, allocation of resources and clarification of standards. The indirect pathway may represent the ability of leadership resources to strengthen doctors' psychological connection with their work.

VI. THEORETICAL IMPLICATIONS

The simulated results illustrate three theoretical implications.

First, clinical leadership can be conceptualised as an organisational job resource. Its importance is not restricted to formal management authority. Support, collaboration and goal clarity may help professionals attain goals and manage demanding responsibilities.

Second, work engagement provides a theoretically plausible mechanism connecting leadership with performance. Models examining only direct relationships may overlook the motivational process through which organisational resources influence professional behaviour.

Third, job performance in university hospitals should be considered multidimensional. The clinical, teaching and research responsibilities of academic doctors cannot be represented adequately by a single clinical-productivity indicator.

VII. PRACTICAL IMPLICATIONS

If a future empirical study produces similar findings, university hospitals should strengthen clinical-leadership development in three areas.

First, leaders should provide structured professional support through mentoring, feedback, career-development discussions and access to resources.

Second, hospitals should develop collaborative systems, including multidisciplinary meetings, shared decision-making, knowledge-sharing platforms and interdepartmental quality-improvement teams.

Third, clinical and academic priorities should be communicated clearly. Doctors should understand how patient-care, teaching and research responsibilities are evaluated and how conflicts between these responsibilities should be managed.

Engagement should also be monitored as an organisational outcome. Leadership programmes should not be evaluated solely according to attendance or satisfaction. Evaluation should determine whether the programme improves perceived support, collaboration, goal clarity and professional engagement.

VIII. LIMITATIONS AND FUTURE RESEARCH

The most important limitation is that all observations were synthetically generated. The results demonstrate how the proposed model can behave under programmed assumptions, but they provide no empirical evidence concerning actual doctors or university hospitals.

The simulation cannot estimate actual population means, effect sizes, response patterns or institutional differences. The balanced allocation of 75 observations to each hospital was imposed for demonstration and does not represent the true distribution of doctors.

The structural results are partly determined by the data-generation process. Statistical significance therefore should not be interpreted as independent confirmation of Job Demands-Resources Theory.

A genuine study should recruit doctors using a defensible probability-sampling procedure and report the numbers eligible, invited, responding and analysed. Validated instruments, research-ethics approval and informed consent would be required.

Future empirical research should also consider longitudinal or time-lagged designs. Cross-sectional measurement cannot conclusively establish that leadership precedes engagement or that engagement precedes performance.

Multisource performance information should be considered. Self-rated clinical performance may be supplemented by supervisor assessments, teaching evaluations, research outputs and appropriate administrative indicators.

Because doctors are nested within departments and hospitals, future research should examine multilevel effects when a sufficient number of organisational units is available.

IX. CONCLUSION

This simulation study demonstrated a Job Demands-Resources model connecting clinical leadership, professional work engagement and job performance among hypothetical doctors in Malaysian university hospitals.

Professional support, collaborative culture and goal clarity were positively related to work engagement. Clinical leadership and work engagement were positively related to job performance. Work engagement demonstrated a significant simulated mediating effect.

The model explained 33.2% of the variation in professional work engagement and 41.1% of the variation in job performance. The indirect pathway accounted for approximately 51% of the total simulated leadership–performance relationship.

These findings illustrate the proposed analytical model and provide a foundation for questionnaire testing, SmartPLS model specification and planning a genuine multicentre study. They must not be interpreted as findings obtained from actual doctors.

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