

Healthcare Human Resource Development: Organizational Support and Work Engagement among Clinical Clerkship Students

Gunawan Eko Nurtjahjono^{1*}, Hefry Johan Ferdhianzah²

Universitas Brawijaya, Malang, Indonesia^{1,2}

gunawan_fia@ub.ac.id^{1*},



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Abstract

Purpose: This study examined work engagement among clinical clerkship students from a healthcare human resource development perspective. Specifically, it analyzes how perceived organizational support and the clinical learning environment influence work engagement during pediatric clinical education and evaluates whether the clinical learning environment functions as a moderating condition in this relationship.

Methodology: A quantitative cross-sectional survey involving 251 clinical clerkship students at Rumah Sakit Saiful Anwar, affiliated with the Universitas Brawijaya, was conducted. Data were collected using structured questionnaires and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.

Results: Perceived organizational support and the clinical learning environment positively influenced work engagement. The clinical learning environment was the strongest predictor, emphasizing the roles of supportive supervision, open communication, psychological safety, and collaborative learning during the clinical rotations. However, its moderating effect was not significant, indicating that it functions as an independent predictor rather than a strengthening mechanism.

Conclusions: Direct clinical learning experiences play a central role in shaping engagement among clinical clerkship students.

Limitations: This study was conducted in a single teaching hospital, focused exclusively on pediatric clinical education, employed a cross-sectional design, and relied on self-reported data, limiting causal inference and generalizability.

Contributions: This study contributes to the healthcare education and organizational behavior literature by highlighting the importance of supportive clinical learning environments in strengthening engagement among clinical clerkship students during professional medical training.

Keywords: *Clinical Clerkship Students, Clinical Learning Environment, Healthcare Human Resource Development, Perceived Organizational Support, Work Engagement*

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1. Introduction

The increasing complexity of healthcare systems has intensified global attention on the sustainability and development of healthcare human resources ([Shanafelt, Dyrbye, & West, 2021](#); [West, Dyrbye, Erwin, & Shanafelt, 2016](#)). Healthcare institutions are expected to provide high-quality clinical services and prepare future healthcare professionals who are psychologically resilient, professionally engaged, and capable of adapting to dynamic clinical environments ([Bailey, Madden, Alfes, & Fletcher, 2017](#); [Dzau, Kirch, & Nasca, 2020](#)). In this context, clinical clerkship students represent an important component of the future healthcare workforce because they undergo intensive professional and organizational socialization during clinical education in teaching hospitals ([Cruess, Cruess, Boudreau, Snell, & Steinert, 2015](#); [Poncelet, Hansen, Hirsh, Ogur, Alexander, Krupat, Hauer, & Teherani, 2015](#)).

Clinical medical education places clinical clerkship students in high-pressure learning environments characterized by heavy workloads, time constraints, emotional challenges, and continuous interactions with multidisciplinary healthcare teams. During clinical rotations, clinical clerkship students must simultaneously adapt to educational expectations, clinical responsibilities, and organizational systems within teaching hospitals. When organizational and educational support systems are perceived as insufficient, these conditions may affect psychological well-being, motivation, and engagement throughout clinical training ([Dyrbye, West, & Satele, 2014](#); [Moriarty, McKinley, & Ngu, 2023](#); [Shanafelt et al., 2021](#); [West et al., 2016](#)).

Within the organizational behavior and human resource management literature, perceived organizational support has been recognized as an important antecedent of positive psychological and behavioral outcomes. Organizational Support Theory explains that individuals tend to develop stronger attachment and involvement when they perceive that organizations value their contributions and care about their well-being ([Eisenberger, Huntington, Hutchison, & Sowa, 1986](#)). Previous studies have further indicated that supportive organizational systems strengthen engagement, motivation, psychological resilience, and adaptive behavior, particularly in high-pressure professional environments such as healthcare institutions ([Albrecht, Breidahl, & Marty, 2021a](#); [Bailey et al., 2017](#); [Saks, 2022](#)).

In clinical education settings, organizational support may include supervisory responsiveness, communication quality, academic guidance, constructive feedback, and institutional concern for students' learning experiences. From the perspective of the Job Demands–Resources (JD-R) Theory, such resources may function as protective and motivational factors that help clinical clerkship students maintain engagement in intensive clinical settings ([Bakker, & Demerouti, 2023](#); [Lesener, Gusy, & Wolter, 2020](#)). Previous studies have demonstrated that supportive clinical learning environments positively influence learning participation, psychological safety, and professional development among healthcare learners ([Chan, Sum, Tan, Tor, & Sim, 2021](#); [Schönrock-Adema, Bouwkamp-Timmer, van Hell, & Cohen-Schotanus, 2023](#)).

Nevertheless, most medical education studies have predominantly focused on burnout, stress, academic performance, and learning satisfaction, while work engagement has received limited attention from the human resource management perspective. Moreover, studies integrating perceived organizational support, clinical learning environments, and work engagement within a single framework are limited, particularly in the context of teaching hospitals in developing countries. Evidence from medical education settings in developing countries and non-Western contexts has also shown that organizational support, educational climate, and supervisory quality are important factors associated with trainee engagement, professional adaptation, and learning outcomes ([Findyartini, Syah, Susilo, Nurokhmani, Qomariyah, Greviana, Ainin, Sari, & Claramita, 2023](#); [Hammad, Eqtait, Salameh, Ayed, & Fashafsheh, 2024](#); [Puranitee, Kaewpila, Heeneman, van Mook, & Busari, 2022](#)).

Unlike previous studies that primarily examined psychological distress or learning outcomes, this study's novelty lies in positioning work engagement as a healthcare human resource development outcome among clinical clerkship students and examining the combined roles of perceived

organizational support and clinical learning environment within a developing country teaching hospital context. Therefore, this study aimed to examine the influence of perceived organizational support on work engagement among clinical clerkship students during pediatric clinical education and to investigate whether the clinical learning environment functions as a moderating condition. By integrating the Organizational Support Theory and the JD-R framework, this study contributes to the literature on healthcare human resource development and engagement in teaching hospital environments.

2. Literature Review and Hypotheses Development

2.1 Perceived Organizational Support

Perceived Organizational Support (POS) refers to individuals' perceptions of the extent to which organizations value their contributions and care about their well-being ([Eisenberger, Huntington, Hutchison, & Sowa, 1986](#)). Within Organizational Support Theory, supportive organizational treatment encourages reciprocal psychological responses, including stronger attachment, trust, commitment, and willingness to contribute to organizational goals. From a social exchange perspective, individuals who perceive adequate organizational support are more likely to develop emotional attachment and positive attitudes toward their institution ([Kurtessis, Eisenberger, Ford, Buffardi, Stewart, & Adis, 2017](#); [Rhoades, & Eisenberger, 2002](#)). Previous studies have shown that POS is associated with positive psychological and behavioral outcomes in organizational settings. [Saks \(2022\)](#) emphasized that organizational support strengthens employees' sense of belonging by fulfilling their socio-emotional needs. Similarly, [Albrecht, Breidahl, and Marty \(2021a\)](#) identified supportive leadership, communication quality, and institutional concerns for employee welfare as important organizational resources. Supportive organizational climates have also been linked to proactive behavior, psychological resilience, motivation, and adaptive responses in complex work environments ([Bailey, Madden, Alfes, & Fletcher, 2017](#); [Caesens, & Stinglhamber, 2020](#)).

In clinical medical education, POS may differ from conventional workplace settings because clinical clerkship students occupy hybrid roles as learners and healthcare service providers. During clinical rotations, they must adapt to institutional regulations, supervision processes, intensive schedules, and professional expectations within the teaching hospital systems. Therefore, organizational support in this context may include supervisory responsiveness, communication quality, learning accessibility, constructive feedback, fairness, and institutional concerns for student well-being. Although organizational support has been widely examined in workplace and healthcare contexts, empirical studies focusing on perceived organizational support among clinical students remain limited. Existing medical education research has emphasized stress, burnout, academic performance, and learning satisfaction, while organizational dimensions within clinical education systems remain underexplored. Therefore, examining POS among clinical clerkship students contributes to the intersection between healthcare education and human resource management, particularly within teaching hospital environments in developing countries.

2.2 Work Engagement

Work engagement is an important construct in organizational behavior and human resource management because it reflects individuals' positive psychological connections to their professional roles and responsibilities. [Bailey et al. \(2017\)](#) described engagement as a multidimensional construct associated with motivation, organizational attachment, performance, and psychological wellbeing. [Schaufeli et al. \(2002\)](#) defined work engagement as a positive work-related psychological state characterized by vigor, dedication, and high levels of absorption. Individuals with high engagement generally demonstrate enthusiasm, persistence, and active involvement in their professional activities. Recent studies further indicate that employee engagement is influenced by person–organization fit, supervisor support, psychological safety, and psychosocial safety climate, confirming that engagement remains a relevant outcome in contemporary human resource development research ([Fahrizal et al., 2025](#); [Hossain et al., 2024](#); [Larasandi & Satrya, 2025](#)).

In healthcare settings, work engagement is closely related to professional performance, psychological resilience and service quality. Engaged healthcare personnel are more likely to maintain motivation,

demonstrate professional commitment, and provide patient-centered care in intensive healthcare environments ([Knight et al., 2017](#); [Schaufeli, 2017](#)). From the Job Demands-Resources (JD-R) perspective, engagement develops when individuals have sufficient resources to manage occupational demands and maintain psychological energy during professional activities ([Bakker & Demerouti, 2023](#)). In clinical medical education, work engagement reflects clinical clerkship students' enthusiasm for clinical learning, active participation in patient care, and psychological involvement during professional training. Unlike regular employees, clinical clerkship students occupy hybrid roles as both learners and healthcare service providers. Therefore, their engagement may be shaped by academic expectations, clinical responsibilities, supervision quality, and interactions within teaching hospital environments.

Although engagement has received growing attention in healthcare organizations, empirical studies on work engagement among clinical clerkship students remain limited, particularly in the context of teaching hospitals in developing countries. Existing medical education research has emphasized burnout, stress, anxiety, academic outcomes, and learning satisfaction, while engagement as a positive psychological construct remains comparatively underexplored. Consequently, examining work engagement in clinical medical education contributes to the healthcare human resource management and medical education literature.

2.3 Clinical Learning Environment

The clinical learning environment is a fundamental component of medical education because it shapes the way clinical clerkship students experience professional learning, interpersonal interaction, and adaptation during clinical training. Unlike classroom-based education, clinical learning environments involve direct exposure to patient care, multidisciplinary collaboration, supervision, and real-time clinical decision-making. Previous medical education literature has emphasized that the learning environment, curriculum climate, and educational atmosphere are important dimensions influencing students' professional development during clinical training ([Genn, 2001](#); [Gruppen et al., 2019](#)). [Flott and Linden \(2016\)](#) conceptualized the clinical learning environment as a multidimensional construct encompassing supervision quality, learning climate, communication patterns, teamwork, organizational culture, feedback systems, and opportunities for active participation in clinical activities. These dimensions influence how students interpret their clinical experiences, develop professional competencies, and adapt to the expectations of healthcare practice.

Previous studies have generally indicated that supportive clinical learning environments contribute positively to learning satisfaction, self-confidence, professional competence, and psychological safety among healthcare learners ([Chan et al., 2021](#); [Edmondson, 2019](#)). Psychological safety has also been recognized as an important educational condition that facilitates open communication, interpersonal trust, and learning behaviors within collaborative professional environments ([Newman et al., 2017](#)). Psychological safety, social support, and supportive organizational climates are important factors in shaping individual adjustment, engagement, and organizational outcomes ([Camlian & Baron, 2025](#); [Fahrizal et al., 2025](#)). Evidence from developing countries' medical education contexts further suggests that supportive supervision, constructive feedback, and positive learning climates contribute substantially to students' professional development and adaptation during clinical training ([Findyartini et al., 2023](#); [Hammad et al., 2024](#); [Puranitee et al., 2022](#)).

However, the findings regarding clinical learning environments remain context-dependent. While supportive learning environments are frequently associated with positive educational outcomes, high-pressure clinical settings may also generate stress and psychological strain among healthcare trainees. Such variations suggest that the influence of clinical learning environments depends on supervision quality, communication patterns, organizational culture, and interpersonal dynamics within specific clinical departments. From the perspective of the Job Demand-Resources (JD-R) theory, supportive educational resources may help individuals adapt to demanding clinical conditions and maintain positive learning experiences ([Bakker & Demerouti, 2023](#)). In clinical education settings, supervision quality, communication openness, feedback accessibility, and collaborative learning climates are important resources that facilitate professional adaptation during clinical training.

Despite growing scholarly attention to clinical learning environments, existing studies have predominantly focused on learning satisfaction, academic achievement, and clinical competence. Limited attention has been devoted to understanding how clinical learning environments contribute to broader organizational and psychological outcomes in healthcare education. Consequently, examining the clinical learning environment in pediatric clinical education provides important insights into the role of educational experiences within teaching hospital settings, particularly in developing countries.

2.4 Relationship among Variables

The relationship between perceived organizational support and work engagement has been widely discussed in the organizational behavior and human resource management literature. Organizational Support Theory explains that individuals who perceive stronger organizational concern and appreciation tend to develop reciprocal psychological responses, including greater attachment, motivation, and engagement in their professional roles ([Eisenberger et al., 1986](#)). Supportive organizational conditions strengthen engagement through socio-emotional fulfillment, psychological attachment and meaningful professional experiences ([Bailey et al., 2017](#); [Saks, 2022](#)). Supportive leadership, communication responsiveness, and organizational concern have also been associated with stronger employee engagement and positive organizational outcomes ([Albrecht, Breidahl, & Marty, 2021b](#)).

Within healthcare education, organizational support may function as a psychological resource that helps clinical clerkship students maintain their involvement and adapt professionally during clinical training. However, clinical clerkship students simultaneously navigate academic, clinical, and organizational responsibilities, making engagement influenced not only by institutional support but also by daily clinical learning experiences in teaching hospitals. Based on Organizational Support Theory and previous empirical findings, the following hypothesis is proposed:

H₁: Perceived organizational support positively influences work engagement among clinical clerkship students

In addition to organizational support, the clinical learning environment is an important factor influencing engagement in medical education. Clinical learning environments include supervision quality, communication openness, teamwork, psychological safety, learning climate, and opportunities for active participation in clinical practice. Supportive learning environments are generally associated with stronger learning participation, professional adaptation, and psychological involvement among healthcare learners ([Chan et al., 2021](#); [Schönrock-Adema et al., 2023](#)).

From the Job Demands-Resources (JD-R) perspective, supportive educational resources may strengthen engagement by helping individuals manage intensive educational and professional demands ([Bakker & Demerouti, 2023](#)). In clinical education settings, positive learning climates, constructive supervision, and collaborative communication may function as motivational resources that support clinical clerkship students' engagement. In pediatric clinical education, where students frequently encounter emotionally intensive situations and continuous patient interactions, supportive learning environments are expected to strengthen professional participation during clinical training. Therefore, the following hypothesis is proposed:

H₂: Clinical learning environment positively influences work engagement among clinical clerkship students

In addition to its direct effect, the clinical learning environment may function as a contextual resource that shapes the extent to which organizational support is translated into work engagement. From the JD-R perspective, organizational resources are more likely to generate engagement when they are supported by positive environmental conditions. In this study, perceived organizational support represents a broader institutional resource, whereas the clinical learning environment represents the immediate educational context in which clinical clerkship students experience supervision, feedback, communication, teamwork, and psychological safety.

A supportive clinical learning environment may strengthen the effect of organizational support because clinical clerkship students can directly experience institutional support through constructive supervision, open communication, accessible feedback, and psychologically safe interactions within clinical departments. Conversely, when the learning environment is hierarchical, stressful, or psychologically unsafe, broader organizational support may become less salient because students' daily clinical experiences are dominated by proximal educational pressure. Therefore, the clinical learning environment is theoretically positioned not only as a direct predictor of engagement but also as a contextual condition that may amplify or weaken the relationship between perceived organizational support and work engagement.

Despite the growing scholarly attention toward organizational support and clinical learning environments, empirical studies examining the moderating role of clinical learning environments remain limited. Existing research predominantly positions clinical learning environments as direct predictors of educational outcomes, rather than as contextual mechanisms that shape organizational relationships. Consequently, empirical evidence regarding whether clinical learning environments strengthens the relationship between organizational support and engagement remains insufficient, particularly within teaching hospital environments in developing countries. Based on these theoretical arguments, the following hypothesis is proposed.

H₃: Clinical learning environment moderates the relationship between perceived organizational support and work engagement among clinical clerkship students

2.5 Research Gap and Hypothesis Development

This study integrates Organizational Support Theory and the Job Demands-Resources (JD-R) theory to explain how organizational and educational factors influence work engagement among clinical clerkship students participating in pediatric clinical education. Organizational Support Theory emphasizes that individuals tend to develop stronger psychological attachment and reciprocal positive behavior when they perceive that institutions value their contributions and care about their well-being ([Eisenberger et al., 1986](#)). Within clinical education settings, perceived organizational support may emerge through supervisory responsiveness, communication quality, institutional facilitation, and organizational concern for students' learning experiences.

Previous longitudinal studies based on the JD-R framework have also demonstrated that organizational and psychological resources play important roles in sustaining engagement in demanding professional environments ([Lesener et al., 2020](#)). In clinical medical education, clinical clerkship students frequently encounter emotionally intensive clinical situations, intensive learning schedules, professional pressure, and continuous performance evaluations. Consequently, organizational and educational resources are important for maintaining psychological resilience and engagement during clinical rotations. Based on these theoretical perspectives, perceived organizational support is expected to positively influence work engagement because supportive organizational systems may strengthen students' motivation, emotional attachment, and willingness to participate actively in clinical learning. Clinical clerkship students who perceive stronger institutional support are more likely to demonstrate enthusiasm, dedication, and persistence throughout their clinical education.

In addition to organizational support, the clinical learning environment is an important determinant of engagement. Supportive supervision, constructive feedback, open communication, teamwork, and psychological safety may strengthen students' confidence and professional involvement during pediatric clinical rotations. However, previous studies remain inconclusive regarding whether clinical learning environments function only as direct predictors of engagement or also operate as contextual mechanisms that strengthen organizational influence. Existing findings remain fragmented, particularly within teaching hospital settings in developing countries, where organizational structures and clinical learning experiences may differ substantially from those reported in developed healthcare systems.

Unlike previous studies that predominantly examined engagement from the perspectives of psychological distress or academic performance, this study positions work engagement as an organizational and educational outcome shaped by both institutional support and clinical learning experiences within teaching hospital environments. Therefore, this study proposes that the clinical learning environment not only directly influences work engagement but may also strengthen the relationship between perceived organizational support and engagement among clinical clerkship students. The integration of these variables offers a more contextual and theoretically grounded understanding of engagement in healthcare education environments. The conceptual framework of this study is presented in Figure 1 based on the proposed theoretical relationships.

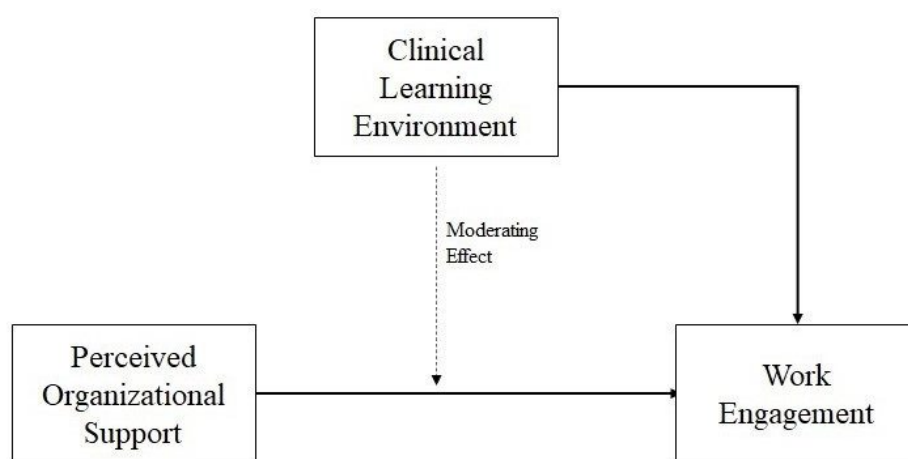


Figure 1. Conceptual framework of the study

3. Methodology

3.1 Research Design

This study employed a quantitative explanatory design to examine the relationships among perceived organizational support, clinical learning environment, and work engagement among clinical clerkship students undergoing pediatric clinical education. The study was grounded in Organizational Support Theory and the Job Demand-Resources (JD-R) theory, which explain how organizational and educational resources contribute to engagement within demanding professional environments ([Bakker, & Demerouti, 2023](#); [Eisenberger, Huntington, Hutchison, & Sowa, 1986](#)).

A cross-sectional survey approach was applied by collecting data from clinical clerkship students participating in pediatric clinical rotations at the Faculty of Medicine, Universitas Brawijaya, affiliated with Rumah Sakit Saiful Anwar. Cross-sectional survey designs are widely used in organizational and behavioral research to examine the relationships among variables within naturally occurring settings ([Creswell & Creswell, 2017](#)). The pediatric clerkship program was selected because it involves intensive clinical learning activities, including bedside teaching, emergency department exposure, consultant supervision, and interprofessional interaction within the teaching hospital environment. Data were collected using structured questionnaires designed to measure the perceived organizational support, clinical learning environment, and work engagement during clinical education activities. The survey method was considered appropriate because the study focused on respondents' perceptions and psychological experiences in organizational and clinical learning contexts ([Sekaran & Bougie, 2019](#)).

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4 software. PLS-SEM was selected because this study examined complex relationships among latent constructs, including direct and moderating effects. According to [Hair, Hult, Ringle, and Sarstedt, \(2022\)](#), PLS-SEM is appropriate for predictive and explanatory models involving organizational and behavioral constructs that are measured using perceptual indicators. The analytical procedure involved measurement model evaluation through convergent validity, discriminant validity, indicator reliability, and composite reliability assessment, followed by structural model evaluation

using path coefficients, the coefficient of determination (R^2), predictive relevance (Q^2), effect size (f^2), and bootstrapping analysis. Overall, the research design enabled a comprehensive examination of how organizational support and clinical learning environments contribute to work engagement among clinical clerkship students in pediatric clinical education settings.

3.2 Research Setting and Participants

This study was conducted in the pediatric clinical clerkship program at the Faculty of Medicine, Universitas Brawijaya, affiliated with Rumah Sakit Saiful Anwar. Rumah Sakit Saiful Anwar was selected because it serves as the main teaching hospital of the Faculty of Medicine, Universitas Brawijaya, and provides intensive clinical training, structured supervision, and interprofessional interactions that are highly relevant to the study variables. Consequently, this setting provides an appropriate context for examining organizational support, clinical learning environment, and work engagement among clinical clerkship students.

The participants were clinical clerkship students enrolled in the pediatric clinical rotation program during the study period. Clinical clerkship students are final-stage medical students who undertake supervised clinical rotations in teaching hospitals as part of their professional medical training. The final sample of 251 respondents represented all valid responses obtained from eligible clinical clerkship students after incomplete and inconsistent questionnaires were excluded from the study. Considering the relatively homogeneous population and the predictive nature of the PLS-SEM approach, the sample size obtained was considered adequate for statistical analysis. Clinical clerkship students were considered appropriate participants because they directly experience organizational systems, clinical supervision, educational dynamics, and professional adaptation processes throughout their clinical training.

This study employed purposive sampling to select respondents who met the criteria directly aligned with the research objectives ([Sekaran & Bougie, 2019](#)). Purposive sampling was considered appropriate because only clinical clerkship students actively participating in pediatric clinical rotations had direct experience with the organizational support, clinical learning environment, and engagement conditions examined in this study. The inclusion criteria required participants to be actively involved in pediatric clinical rotations and to be willing to participate voluntarily in the survey process. Respondents who submitted incomplete questionnaire responses were excluded from the final analyses.

The participants had relatively diverse academic and clinical backgrounds. Based on the clerkship records, respondents had an average age of approximately 21.8 years and an average pre-clinical academic performance index of 3.64 on a four-point grading scale. Many participants had also completed several clinical rotations before entering the pediatric clerkship program, providing varied clinical learning experiences relevant to the study context. Data were collected using structured online questionnaires distributed during the active clinical rotation period. Prior to participation, respondents were informed of the purpose of the study, confidentiality procedures, and voluntary participation principles. All personal identifiers were excluded from the analysis to maintain participant anonymity and confidentiality.

3.3 Data Collection Procedure

Data were collected through a structured online survey involving clinical clerkship students participating in the pediatric clinical clerkship program at the Faculty of Medicine, Universitas Brawijaya, affiliated with Rumah Sakit Saiful Anwar. Eligible participants were identified through the pediatric clerkship administrative database, and questionnaires were distributed during the active clinical rotation period. Before completing the questionnaire, the participants received information regarding the study objectives, voluntary participation principles, and confidentiality procedures. Respondents who agreed to participate proceeded to the informed consent section provided at the beginning of the survey form. All personal identifiers were excluded from the analytical process to maintain the anonymity and confidentiality of the participants.

The questionnaire consisted of closed-ended statements measured using a five-point Likert scale ranging from strongly disagree to strongly agree. The measurement items were adapted from established international scales and contextually adjusted to reflect pediatric clinical education, supervision processes, organizational support, and work engagement experiences among clinical clerkship students. The adapted items were reviewed to ensure conceptual relevance and clarity before distribution to respondents. After data collection, incomplete and inconsistent responses were excluded from the analysis. The final dataset was coded and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4 software.

3.4 Measurement of Variables

This study examined three main variables, such as perceived organizational support, clinical learning environment, and work engagement. All variables were measured using structured questionnaire instruments adapted from established international scales in organizational behavior, healthcare education, and human resource management. The adaptation process was conducted by adjusting the wording of the selected items to fit the context of pediatric clinical education while maintaining the conceptual meaning of the original constructs.

All items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Perceived organizational support was adapted from the Survey of Perceived Organizational Support (SPOS) developed by [Eisenberger, Huntington, Hutchison, and Sowa \(1986\)](#), focusing on organizational concern, supervisory support, fairness, and institutional responsiveness during the clinical rotations. The clinical learning environment was measured using indicators adapted from previous healthcare education studies, emphasizing learning climate, supervision quality, communication openness, teamwork, feedback, and psychological safety during pediatric clinical education. Work engagement was measured using items adapted from the Utrecht Work Engagement Scale (UWES) developed by [Schaufeli, Salanova, González-Romá, and Bakker \(2002\)](#), which covers vigor, dedication, and absorption.

To ensure contextual relevance, the adapted items were reviewed for conceptual clarity, wording suitability, and alignment with the clinical clerkship setting. Prior to hypothesis testing, the measurement model was evaluated using PLS-SEM through indicator reliability, convergent validity, discriminant validity, Cronbach Alpha, and Composite Reliability. This procedure was conducted to ensure that the adapted instruments demonstrated adequate validity and reliability in measuring the constructs in the pediatric clinical education context. Demographic and educational characteristics, including age, gender, academic performance index, previous clinical rotation experience, and rotation cohort, were collected descriptively for respondent profiling.

3.5 Data Analysis Technique

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4 software. PLS-SEM was selected because this study examined the direct and moderating relationships among latent organizational and psychological constructs within a predictive research framework ([Hair et al., 2022](#)). Prior to the analysis, incomplete and inconsistent responses were excluded from the dataset. Descriptive statistics were used to summarize the respondents' characteristics, including age, academic background, and clinical rotation experience.

The analytical procedure consisted of a measurement model evaluation and a structural model evaluation. The measurement model assessment included convergent validity, discriminant validity, indicator reliability, and internal consistency. Convergent validity was assessed using outer loadings and Average Variance Extracted (AVE), while reliability was evaluated using Composite Reliability (CR) and Cronbach alpha. Discriminant validity was assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT). After the measurement model met the required criteria, the structural model was evaluated using path coefficients, the coefficient of determination (R^2), predictive relevance (Q^2), and effect size (f^2). Hypothesis testing, including the moderating effect of the clinical learning environment, was conducted using a bootstrapping procedure to obtain t-statistics and p-values.

3.6 Ethical Consideration

This study was conducted in accordance with the general ethical principles of social and healthcare education research, including voluntary participation, confidentiality protection, anonymity, and responsible data management. Eligible participants were identified through the pediatric clerkship administrative database solely for survey distribution purposes, and all personal identifiers were excluded from the analytical and publication processes. Prior to completing the questionnaire, respondents received information regarding the study objectives, voluntary participation procedures, confidentiality protection, and the academic use of the collected data. Participants were informed that their participation would not influence academic evaluations, clinical assessments, or clerkship administrative processes. Respondents who agreed to participate proceeded to the informed consent section provided at the beginning of the online survey. To maintain anonymity, the questionnaire was completed without collecting personal identifying information, and all responses were analyzed in aggregate using anonymized data. The online survey format also facilitated flexible participation in clinical education activities within the teaching hospital environment.

4. Results and Discussions

4.1 Respondent Profile

This study involved 251 clinical clerkship students participating in pediatric clinical education in a teaching hospital environment affiliated with Universitas Brawijaya. The respondents were clinical clerkship students directly exposed to organizational systems, supervision processes, and clinical learning environments during pediatric clinical education. Therefore, the participants were relevant for examining the relationship between perceived organizational support, clinical learning environment, and work engagement within teaching hospital settings.

The respondent profile is important to describe because clinical clerkship students experience complex organizational and educational dynamics during their clinical rotations. In the pediatric clerkship context, participants are required to demonstrate academic competence and adapt psychologically, socially, and professionally within high-intensity healthcare environments. Consequently, perceptions of organizational support and the quality of the clinical learning environment are highly relevant in shaping work engagement throughout the clinical education process.

The respondents were drawn from multiple pediatric rotation groups with relatively diverse clinical backgrounds. Most participants had previously completed several clinical rotations before entering the pediatric clerkship, allowing them to compare supervisory styles, communication climates, workload patterns, and educational experiences across departments. Such variations provide a meaningful context for evaluating how organizational and learning-related factors influence engagement among clinical clerkship students. Table 1 presents the respondents' characteristics.

Table 1. Respondent characteristics

Characteristic	Description
Total respondents	251 clinical clerkship students
Research setting	Pediatric Clinical Clerkship Program
Institution	Universitas Brawijaya
Clinical education setting	Teaching hospital-based pediatric rotation
Professional phase	Clinical clerkship program
Research approach	Quantitative survey
Data analysis method	Partial Least Squares Structural Equation Modeling (PLS-SEM)
Software used	SmartPLS 4
Main variables	Perceived Organizational Support, Clinical Learning Environment, and Work Engagement

During the pediatric rotation, clinical clerkship students were exposed to intensive clinical activities involving bedside teaching, inpatient and outpatient services, case discussions, Mini-Clinical Evaluation Exercises (Mini-CEX), and shift-based supervision across multiple clinical units. These activities create dynamic learning environments characterized by continuous professional interaction, adaptation demands, and organizational coordination within teaching hospital systems. The respondents were clinical clerkship students from multiple cohort groups participating in pediatric clerkship programs during different academic periods. The integration of educational responsibilities, clinical exposure, and organizational adaptation provided an appropriate context for examining the relationships among perceived organizational support, clinical learning environment, and work engagement. The final structural model generated using PLS-SEM analysis is shown in Figure 2. The model illustrates the relationships among perceived organizational support, the clinical learning environment, work engagement, and the moderating effect examined in this study.

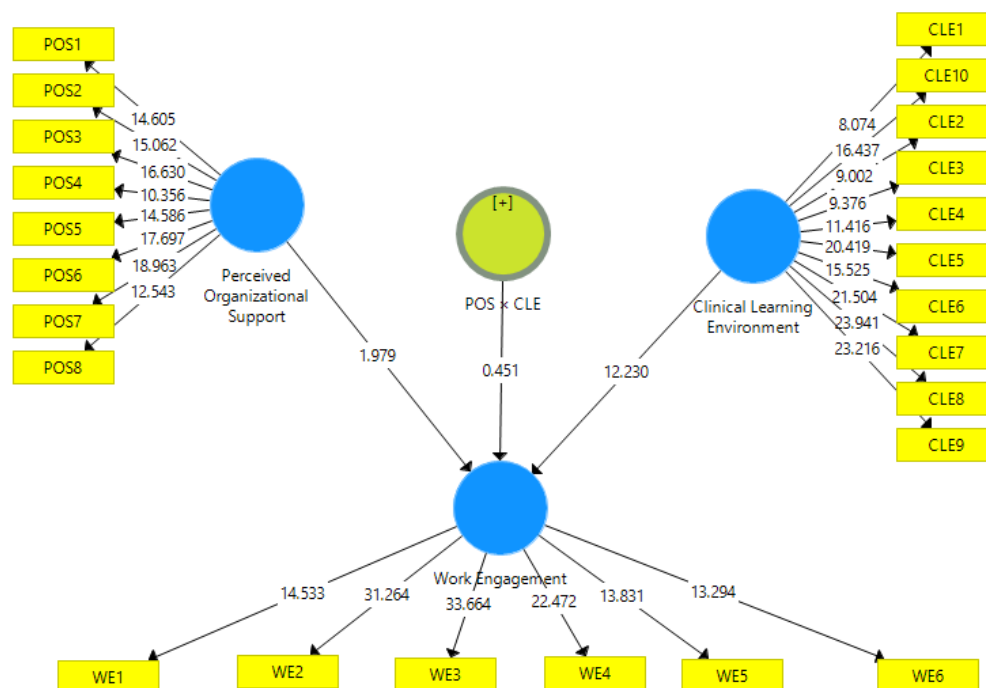


Figure 2. Structural model of PLS-SEM results

Based on the structural model presented in Figure 2, the clinical learning environment demonstrated the strongest relationship with work engagement, while perceived organizational support also showed a positive relationship with engagement. In contrast, the moderating effect of the clinical learning environment on the relationship between perceived organizational support and work engagement was found to be statistically weak. These findings indicate that direct clinical educational experiences may play a more dominant role in shaping engagement among clinical clerkship students than interaction-based moderation mechanisms within the organizational context.

4.2 Measurement Model Assessment

A measurement model assessment was conducted to evaluate the adequacy of the research instrument before examining the structural relationships among the variables. In Partial Least Squares Structural Equation Modeling (PLS-SEM), measurement model evaluation plays an important role in ensuring that each construct is empirically reliable, conceptually valid, and capable of accurately representing the latent variables examined in the study. The assessment in this study focused on indicator reliability, convergent validity, internal consistency, and discriminant validity.

Indicator reliability was initially assessed using outer-loading values. The results demonstrated that most indicators showed satisfactory loading values above the recommended thresholds. Several indicators within the work engagement construct initially exhibited relatively low loading values and

were therefore excluded from the final model to improve the construct consistency and measurement accuracy. After the refinement process, all remaining indicators demonstrated acceptable loading values and adequately represented their constructs.

The final indicator loading ranges showed that the perceived organizational support indicators ranged from 0.640 to 0.749, the clinical learning environment indicators ranged from 0.582 to 0.792, and the work engagement indicators ranged from 0.700 to 0.809. These findings indicate that the remaining indicators possessed sufficient explanatory power to represent the latent constructs within the model. Convergent validity and internal consistency reliability were subsequently evaluated using Average Variance Extracted (AVE), Cronbach Alpha, and Composite Reliability (CR). The results are shown in Table 2.

Table 2. Construct reliability and convergent validity

Variables	Indicator Range	Cronbach Alpha	Composite Reliability	AVE
Perceived Organizational Support	0.640–0.749	0.868	0.895	0.516
Clinical Learning Environment	0.582–0.792	0.890	0.907	0.495
Work Engagement	0.700–0.809	0.857	0.893	0.584

As shown in Table 2, all constructs demonstrated satisfactory internal consistency and reliability. Cronbach Alpha and Composite Reliability values for perceived organizational support, clinical learning environment, and work engagement exceeded the commonly recommended threshold of 0.70, indicating that the indicators consistently measured the intended latent variables. The AVE values further confirmed the acceptable convergent validity across the constructs. Perceived organizational support and work engagement exceeded the recommended AVE threshold of 0.50, indicating that the constructs could explain a substantial proportion of the variance in their indicators. Although the AVE value of the clinical learning environment construct was slightly below the recommended criterion at 0.495, the construct remained acceptable because its Composite Reliability value was high and the AVE value closely approached the threshold. This condition is still considered acceptable in exploratory social and behavioral research when the construct demonstrates strong theoretical relevance and satisfactory reliability. Discriminant validity was evaluated using the Heterotrait–Monotrait Ratio (HTMT), which is widely recommended in contemporary PLS-SEM analyses for assessing construct distinctiveness. The HTMT results are shown in Table 3.

Table 3. Discriminant validity (HTMT)

Variables	POS	CLE	WE
Perceived Organizational Support (POS)	-	0.789	0.662
Clinical Learning Environment (CLE)		-	0.803
Work Engagement (WE)			-

Table 3 shows the HTMT analysis indicated that all inter-construct values were below the recommended threshold of 0.90, demonstrating satisfactory discriminant validity in the research model. The findings confirm that perceived organizational support, clinical learning environment, and work engagement are empirically distinct constructs and do not exhibit excessive conceptual overlap. Overall, the measurement model assessment demonstrated that the research instrument possessed adequate psychometric quality for examining the relationships among organizational support, clinical learning environment, and work engagement within the pediatric clinical education. The results indicate that the constructs were measured reliably and validly, providing a robust foundation for subsequent structural model analysis.

4.2.1 Indicator Reliability and Convergent Validity

Indicator reliability and convergent validity were evaluated using outer loading values, Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach alpha. Outer loading values were used to assess the extent to which each indicator adequately represented its corresponding, latent

construct. The initial measurement model demonstrated that most of the indicators achieved satisfactory loading values. However, indicators WE7, WE8, and WE9 within the work engagement construct showed loading values below the recommended threshold and were therefore excluded to improve construct reliability and validity. Following refinement, all remaining indicators demonstrated acceptable loading values and stronger construct representations. The final outer loading results are presented in Table 4 below.

Table 4. Outer loading of measurement indicators

Constructs	Indicator	Outer Loading
Perceived Organizational Support	POS1	0.749
	POS2	0.747
	POS3	0.737
	POS4	0.678
	POS5	0.729
	POS6	0.745
	POS7	0.713
	POS8	0.640
Clinical Learning Environment	CLE1	0.582
	CLE2	0.601
	CLE3	0.627
	CLE4	0.636
	CLE5	0.761
	CLE6	0.714
	CLE7	0.792
	CLE8	0.778
	CLE9	0.772
	CLE10	0.725
Work Engagement	WE1	0.711
	WE2	0.809
	WE3	0.791
	WE4	0.790
	WE5	0.742
	WE6	0.700

As presented in Table 4, most indicators achieved loading values above 0.70, indicating satisfactory reliability. Several indicators within the perceived organizational support and clinical learning environment constructs showed loading values between 0.60 and 0.70 but were retained because they remained theoretically relevant and contributed adequately to the construct representation. The remaining work engagement indicators demonstrated loading values ranging from 0.700 to 0.809, indicating satisfactory measurement consistency. To further assess convergent validity and construct reliability, Cronbach Alpha, Composite Reliability, and AVE values were evaluated. The results are summarized in Table 5.

Table 5. Construct reliability and convergent validity

Variables	Cronbach Alpha	Composite Reliability	AVE
Perceived Organizational Support	0.868	0.895	0.516
Clinical Learning Environment	0.890	0.907	0.495
Work Engagement	0.857	0.893	0.584

The results demonstrated satisfactory internal consistency reliability, with all Cronbach Alpha and Composite Reliability values exceeding the recommended threshold of 0.70. Perceived organizational support and work engagement achieved AVE values above 0.50, while the clinical learning environment construct showed an AVE value slightly below the recommended threshold of 0.495. Although the AVE value for the clinical learning environment was slightly below 0.50, the value was very close to the recommended criterion and was supported by high Composite Reliability. Therefore, the construct was retained because it demonstrated adequate reliability and strong theoretical relevance in representing supervision quality, communication openness, teamwork, feedback, and psychological safety in pediatric clinical education. Overall, the refined measurement model demonstrated acceptable indicator reliability, convergent validity, and internal consistency reliability, indicating its suitability for subsequent structural model evaluations.

4.3 Structural Model Assessment

Following the satisfactory results obtained from the measurement model evaluation, a structural model assessment was conducted to examine the relationships among perceived organizational support, clinical learning environment, and work engagement. The structural model analysis focused on evaluating the proposed hypotheses by examining the path coefficients, t-statistics, p-values, and confidence intervals generated using the bootstrapping procedure in SmartPLS 4. Structural model evaluation is important because it determines the predictive relationships among constructs and assesses the extent to which the proposed theoretical framework is supported empirically within the context of pediatric clinical education. This study examined the direct effects of perceived organizational support and clinical learning environment on work engagement, as well as the moderating effect of clinical learning environment on the relationship between perceived organizational support and work engagement. The results of the hypothesis testing are presented in Table 6.

Table 6. Path coefficients and hypothesis testing

Hypothesis	Relationship	β	T-Statistic	P-Value	Result
H_1	Perceived Organizational Support $\rightarrow$ Work Engagement	0.121	1.979	0.048	Supported
H_2	Clinical Learning Environment $\rightarrow$ Work Engagement	0.697	12.230	0.000	Supported
H_3	POS $\times$ CLE $\rightarrow$ Work Engagement	0.012	0.451	0.652	Not Supported

As shown in Table 6, perceived organizational support was positively and significantly related to work engagement ($\beta = 0.121$; $t = 1.979$; $p = 0.048$). Although the magnitude of the relationship was relatively modest, the findings indicate that organizational support remains an important factor influencing clinical clerkship students' psychological attachment and engagement during pediatric clinical education. These findings imply that institutional responsiveness, supervisory support, and organizational appreciation contribute meaningfully to maintaining engagement in clinical training activities.

The analysis further revealed that the clinical learning environment had a strong and statistically significant positive effect on work engagement ($\beta = 0.697$; $t = 12.230$; $p = 0.000$). Among all the relationships examined in the model, the clinical learning environment demonstrated the strongest influence on engagement. The analysis highlights the importance of supportive learning climates, constructive supervision, psychological safety, and positive interpersonal interactions in strengthening engagement among clinical clerkship students. The strong relationship between the clinical learning environment and work engagement also reflects the importance of direct educational experiences within teaching hospital environments.

In pediatric clinical rotations, clinical clerkship students are continuously exposed to emotionally demanding situations, intensive supervision, collaborative learning activities and patient-centered responsibilities. Consequently, the quality of the clinical learning environment appears to be a central determinant of enthusiasm, motivation, and professional involvement during clerkship activities. In

contrast, the moderating effect of the clinical learning environment on the relationship between perceived organizational support and work engagement was not statistically significant ($\beta = 0.012$; $t = 0.451$; $p = 0.652$). The findings indicate that the clinical learning environment did not strengthen or weaken the relationship between organizational support and engagement within the proposed model. Although both perceived organizational support and clinical learning environment independently influenced work engagement, the interaction effect between the two constructs was not empirically supported. Collectively, the findings demonstrate that the clinical learning environment functions more strongly as an independent predictor of engagement than as a contextual strengthening mechanism.

In other words, the quality of the learning environment directly contributes to engagement, regardless of the level of perceived organizational support experienced during clinical education. Overall, the structural model assessment demonstrated that the proposed model successfully explained the relationships among organizational support, clinical learning environment, and work engagement in pediatric clinical education. The findings highlight the dominant role of clinical learning experiences in shaping engagement among clinical clerkship students, while also confirming the importance of organizational support within healthcare educational settings.

4.3.1 Coefficient of Determination (R^2)

The explanatory capability of the structural model was evaluated using the coefficient of determination (R^2), which reflects the extent to which the endogenous construct can be explained by the predictor variables included in the model. In this study, work engagement was an endogenous construct predicted by perceived organizational support, clinical learning environment, and the interaction effect between the two variables. The R^2 results are listed in Table 7.

Table 7. Coefficient of determination (R^2)

Endogenous Variable	R^2	Interpretation
Work Engagement	0.604	Moderate-to-substantial

As presented in Table 7, the R^2 value for work engagement was 0.604, indicating that 60.4% of the variance in work engagement could be explained by the clinical learning environment, perceived organizational support, and the interaction effect included in the structural model. This result indicates moderate-to-substantial explanatory power in explaining engagement among clinical clerkship students in pediatric clinical education settings. The findings suggest that organizational and educational factors substantially contribute to work engagement during clinical rotations, with the clinical learning environment demonstrating the strongest contribution within the model. Although the moderating effect was not statistically significant, the model retained a satisfactory explanatory capability through the direct effects of the clinical learning environment and perceived organizational support. Overall, the coefficient of determination analysis indicates that the structural model possesses satisfactory explanatory capability for understanding work engagement among clinical clerkship students in pediatric clinical education.

4.3.2 Effect Size (f^2)

The effect size (f^2) was evaluated to determine the substantive contribution of each exogenous construct to work engagement. According to Cohen classification, f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large effects, respectively, respectively.

Table 8. Effect size (f^2)

Relationship	f^2	Interpretation
Perceived Organizational Support $\rightarrow$ Work Engagement	0.018	Very small effect
Clinical Learning Environment $\rightarrow$ Work Engagement	0.599	Large effect
POS $\times$ CLE $\rightarrow$ Work Engagement	0.001	No effect

As presented in Table 8, the clinical learning environment demonstrated the strongest contribution to work engagement, with an f^2 value of 0.599, indicating a large practical effect within the structural model. In contrast, perceived organizational support showed a relatively small effect size ($f^2 = 0.018$), suggesting a limited practical contribution despite its significant direct effect on work engagement. Meanwhile, the interaction effect between perceived organizational support and clinical learning environment produced an f^2 value of 0.001, indicating the absence of a meaningful moderating contribution. This result is consistent with the hypothesis testing, which showed that the moderating effect was not significant. Overall, the findings indicate that direct clinical learning experiences exert a stronger influence on engagement among clinical clerkship students than broader organizational support mechanisms.

4.3.3 Predictive Relevance (Q^2)

The predictive relevance was evaluated using a blindfolding procedure to assess the predictive capability of the structural model. A Q^2 value greater than zero indicates that the model has predictive relevance for the endogenous construct.

Table 9. Predictive Relevance (Q^2)

Endogenous Variable	Q^2	Interpretation
Work Engagement	0.336	Moderate predictive relevance

As presented in Table 9, the Q^2 value for work engagement was 0.336, indicating that the structural model possessed satisfactory predictive relevance in explaining work engagement among clinical clerkship students within pediatric clinical education settings. The results also indicate moderate predictive capability, suggesting that perceived organizational support, clinical learning environment, and their interaction contribute meaningfully to the prediction of work engagement. Overall, the findings strengthen the robustness of the structural model and demonstrate satisfactory predictive accuracy in the context of clinical medical education.

4.4 Discussion

These findings also support the broader HRM literature, emphasizing that engagement emerges through organizational and psychological conditions that strengthen individuals' motivation, attachment, and professional involvement (Bailey et al., 2017). However, the magnitude of the effects differed considerably, with the clinical learning environment emerging as the strongest predictor of engagement. These findings are also consistent with the longitudinal JD-R literature, suggesting that organizational and environmental resources play substantial roles in maintaining engagement under demanding professional conditions (Lesener et al., 2020). Recent HRM studies also confirm that engagement is shaped by supervisor support, person–organization fit, psychological safety, psychosocial safety climate, and supportive organizational conditions (Fahrizal et al., 2025; Hossain et al., 2024; Larasandi & Satrya, 2025; Syarif, 2025).

The positive relationship between perceived organizational support and work engagement indicates that organizational appreciation, supervisory responsiveness, and institutional concern contribute to strengthening students' psychological attachment during clinical rotations. Clinical clerkship students who perceive stronger organizational support tend to demonstrate greater enthusiasm, dedication, and involvement in clinical learning activities. These findings support the perspective of Organizational Support Theory, which emphasizes that supportive organizational treatment encourages reciprocal positive attitudes and engagement (Eisenberger et al., 1986). The results are also consistent with previous studies showing that organizational support enhances engagement by strengthening socio-emotional attachment and institutional belonging in complex healthcare environments (Kurtessis et al., 2017; Saks, 2022).

The results further revealed that the clinical learning environment exerted a substantially stronger influence on work engagement than perceived organizational support. This finding suggests that direct educational experiences in clinical settings play a central role in shaping engagement among clinical clerkship students. These findings further support the HRM literature, suggesting that psychologically

safe environments facilitate learning participation, communication openness, adaptive professional behavior, and engagement within complex organizational settings ([Newman et al., 2017](#)). These findings align with previous healthcare education studies emphasizing that psychologically safe and supportive learning environments strengthen professional adaptation, participation and engagement during clinical training ([Edmondson, 2019](#); [Gruppen et al., 2019](#)). Similar patterns have been reported in developing countries and non-Western medical education settings, where supervision quality, feedback culture, educational climate, and institutional support were identified as important factors influencing learner engagement and professional adjustment ([Findyartini et al., 2023](#); [Hammad et al., 2024](#); [Puranitee et al., 2022](#)).

Within pediatric clinical education, clinical clerkship students are frequently exposed to emotionally demanding situations, intensive patient interactions, and high professional expectations. Consequently, the quality of the learning environment is an important psychological and educational resource that supports students' adaptation and professional involvement during clinical training. This issue is particularly relevant within healthcare education environments, where prolonged emotional pressure and intensive clinical demands may contribute to psychological strain and disengagement among healthcare trainees ([Dyrbye et al., 2014](#); [West et al., 2016](#)). In contrast, the moderating effect of the clinical learning environment on the relationship between perceived organizational support and work engagement was not statistically significant. This finding indicates that the clinical learning environment did not strengthen or weaken the effect of organizational support on engagement in the proposed model. Instead, the clinical learning environment appears to function more strongly as an independent predictor of student engagement.

One possible explanation is that clinical clerkship students respond more directly to proximal clinical learning experiences, such as supervision quality, feedback accessibility, communication openness, teamwork, and psychological safety, than to the interaction between broader organizational support and learning conditions. In pediatric clinical education, daily educational interactions may be more salient in shaping engagement than institutional support mechanisms, which are perceived more indirectly. Therefore, the non-significant moderation result suggests that engagement among clinical clerkship students is shaped primarily by direct clinical learning experiences rather than interaction-based organizational mechanisms. Collectively, the findings demonstrate that the clinical learning environment functions more strongly as an independent predictor of engagement than as a contextual strengthening mechanism. In other words, the quality of the learning environment directly contributes to engagement, regardless of the level of perceived organizational support experienced during clinical education.

Overall, the findings highlight the importance of creating supportive and psychologically safe clinical learning environments in teaching hospitals. Although organizational support remains important, the quality of daily educational interactions appears to be more influential in shaping engagement among clinical clerkship students than organizational support. Therefore, strengthening supervision quality, communication practices, mentorship, and collaborative learning culture may be essential strategies for improving engagement and educational experiences in pediatric clinical education. These findings also contribute to the growing discussion on healthcare human resource development by demonstrating that engagement in clinical education is shaped not only by institutional support systems but also by direct educational and interpersonal experiences encountered during professional training.

5. Conclusions

5.1 Conclusion

This study concludes that work engagement among clinical clerkship students in pediatric clinical education is shaped by both perceived organizational support and the clinical learning environment. The findings indicate that direct clinical learning experiences play a more central role in strengthening engagement than organizational support. The clinical learning environment appears to function primarily as an independent driver of engagement, rather than as a contextual moderator. Theoretically, this study extends the Organizational Support Theory and the Job Demands–resources

framework by showing that engagement in clinical medical education is shaped by both institutional support and proximal educational resources. This finding contributes to the healthcare human resource management literature by positioning clinical clerkship students as future healthcare professionals whose engagement develops through organizational and educational experiences within teaching hospital environments.

From a managerial perspective, teaching hospitals and medical faculties should strengthen institutional support systems through clear communication, responsive academic coordination, accessible guidance, and structured support mechanisms for clinical clerkship students. These efforts may help improve students' sense of institutional care and professional belonging during their clinical training. From an educational perspective, pediatric clinical education programs should prioritize constructive supervision, timely feedback, psychological safety, collaborative learning, and positive mentorship practices. These actions can create a more supportive clinical learning environment that enhances clinical clerkship students' engagement, professional adaptation, and participation during clinical rotations.

5.2 Research Limitations

This study had several limitations that should be considered when interpreting the findings. First, the research was conducted within a single teaching hospital and focused specifically on pediatric clinical education, which may limit the generalizability of the results to other clinical departments or healthcare-education settings. Differences in organizational culture, supervisory systems, and clinical learning dynamics across institutions may produce different patterns of engagement among clinical clerkship students. Second, the study employed a cross-sectional research design, which means that the data were collected at a single point in time. Consequently, the findings capture respondents' perceptions and engagement conditions only within a specific clinical rotation period and do not fully explain potential changes in engagement over time.

Third, the study relied on self-reported questionnaire data, which may have introduced subjective response tendencies and social desirability bias. Although the respondents completed the questionnaire anonymously, perceptions of organizational support, learning environment, and engagement may still be influenced by individual emotional conditions and personal experiences during clinical training. Finally, this study examined only perceived organizational support and clinical learning environment as predictors of work engagement. Other potentially relevant variables, such as burnout, resilience, leadership style, workload, coping mechanisms, and emotional exhaustion, were not included in the proposed model and may also contribute to explaining engagement in clinical education contexts.

5.3 Suggestions and Directions for Future Research

Future studies should expand the research setting by involving multiple teaching hospitals and different clinical departments to obtain broader insights into work engagement among clinical clerkship students across diverse healthcare education environments. Comparative studies of clinical rotations may provide a deeper understanding of how organizational culture and learning climate influence engagement within specific medical disciplines. Further research may benefit from applying longitudinal research designs to examine changes in work engagement throughout the different stages of clinical education. Such approaches would provide a more comprehensive understanding of how organizational support and clinical learning experiences influence engagement over time.

Future studies should incorporate additional psychological and organizational variables, such as burnout, resilience, emotional exhaustion, mentoring quality, leadership style, and psychological safety, to develop a more comprehensive explanatory model of engagement in clinical education settings. Methodologically, combining quantitative approaches with qualitative exploration may enrich future findings by capturing deeper personal experiences, emotional adaptation processes, and interpersonal dynamics encountered by clinical clerkship students during clinical training. Such approaches may provide a broader contextual understanding of the factors shaping engagement within teaching hospital environments.

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Author Contributions

GEN contributed to the conceptualization, research design, data collection, data analysis, manuscript drafting, and interpretation of the findings. HJF contributed to the research supervision, methodological review, manuscript revision, and final approval of the manuscript. All authors have reviewed and approved the final version of the manuscript.

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