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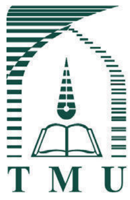

Influence of Clinical Learning Environment Perception on Depression and Anxiety Symptoms in Pediatric Residency Programs

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ABSTRACT

Aims This study aimed to determine the prevalence of depression and anxiety symptoms in pediatric residents, evaluate their perceptions of the clinical learning environment, and examine the influence of this environment on psychological symptoms.

Instrument & Methods This cross-sectional study was conducted involving 66 pediatric residents at Dr. Soetomo Academic General Hospital. Depression and anxiety symptoms were evaluated using the validated Indonesian versions of the Beck Depression Inventory-II and Self-Rating Anxiety Scale, respectively. Perceptions of the clinical learning environment were assessed through the Postgraduate Hospital Educational Environment Measure. Data analysis included linear regression and mediation analysis using the Sobel test.

Findings A total of 6 residents (9.1%) reported symptoms of depression, 8 residents (12.1%) reported symptoms of anxiety, and 4 residents (6.1%) experienced both. Residents' perceptions of the clinical learning environment were generally positive. The perception of social support within the clinical learning environment significantly influenced depression symptoms (p=0.024). However, the residents' perception of the clinical learning environment did not significantly affect anxiety symptoms. Additionally, the perception of social support significantly influenced anxiety symptoms indirectly through depression as a mediating factor (p=0.04).

Conclusion The perception of social support within the clinical learning environment has a significant direct influence on depression symptoms and an indirect influence on anxiety through the mediation of depression symptoms.

Keywords Depression; Anxiety; Environment; Residency

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Introduction

Mental health problems, such as depression and anxiety frequently affect individuals working in high-pressure environments, particularly those in medical residency programs. These programs are characterized by higher academic demands and clinical expectations, which significantly contribute to psychological stress [1, 2]. Anxiety and depression are often inseparable and frequently mistaken for one another due to the overlap in their signs and symptoms. According to Meshram *et al.*, anxiety and depression tend to occur together rather than separately [3]. Tortella-Feliu *et al.* demonstrate a predictive relationship in which anxiety typically precedes depression [4]. The WHO World Mental Health survey also reported that most individuals with comorbid anxiety and depression experienced anxiety before the onset of depression [5].

Numerous studies have documented rising rates of stress-related conditions, including depression and anxiety, among medical professionals. Reported prevalence rates of depression among residents range from 11% to 71.48% [1, 6, 7]. Meanwhile, anxiety affects approximately 11% to 34.8% of this population [6-9].

Various factors can cause mental health issues among residents. The causes of these issues can be classified into three categories: situational, personal, and professional. Situational factors include a lack of sleep, administrative responsibilities, inadequate support from other healthcare professionals, long working hours, heavy workloads, high patient volumes, and a suboptimal learning environment. Personal factors encompass family-related problems, lack of leisure time, financial issues, emotional struggles, and poor stress management. Professional factors involve handling complex patient cases, providing patient care, maintaining relationships with junior residents, and receiving insufficient guidance for future career development [10].

Among the various elements that contribute to mental health issues, the clinical learning environment is particularly important in shaping residents' experiences. Residents' emotions and educational experiences are heavily influenced by their environment, especially the clinical setting in the hospital. This environment plays a crucial role in the process of medical education and has been significantly associated with levels of perceived stress, depressive symptoms, substance use, and social support [1].

A psychometric tool is recognized as one of the most effective and efficient approaches for assessing depression and anxiety [11]. The Beck Depression Inventory-II (BDI-II) is often recommended for evaluating depression, while the Zung Self-Rating Anxiety Scale (SAS) is generally used to assess anxiety. Both instruments have been translated into an Indonesian version and validated with good internal reliability [12, 13]. Several tools have been developed to assess the clinical learning environment in postgraduate medical programs, one of which is the Postgraduate Hospital Educational Environment Measure (PHEEM). The Indonesian version of the PHEEM, developed by Raharjanti & Ramadianto, demonstrated high internal consistency [14].

Early recognition of symptoms related to depression and anxiety in residents, considered a high-risk population, is critical, as is the assessment of the clinical learning environment in the hospital from the perspective of the residents. This approach enables interventions to be specifically directed toward the clinical learning environment as a contributing factor to depression and anxiety. Therefore, this study aimed to identify the prevalence of depressive and anxiety symptoms among pediatric residents, assess their perceptions of the clinical learning environment, and investigate the influence of these perceptions on symptoms of depression and anxiety.

Instrument and Methods

Study design and participants

This cross-sectional study involving pediatric residents took place in February 2025 at Dr. Soetomo General Academic Hospital in Surabaya, Indonesia. The study involved all pediatric residents who were still in clinical rotation at the time of the study, and 76 pediatric residents met this criterion. Ten residents were excluded due to a history of depression and anxiety and being on leave. Eligible participants provided informed consent. Residents who were on leave or had been identified as experiencing symptoms of depression and/or anxiety were excluded from the study.

Assessment tools

The Indonesian version of the BDI-II, developed and validated by Ginting *et al.*, was used to measure depression symptoms. The Indonesian version of the instrument demonstrates high reliability, with a Cronbach's alpha of 0.90 and a significant test-retest correlation ($r=0.55$, $p<0.01$). The tool comprises 21 groups of statements, each with four response options. Residents are allowed to choose only one option that best describes their feelings over the past 2 weeks, including the time of their assessment. Each statement is scored on a scale of 0-3, ranging from no symptoms to severe symptoms. Residents are considered depressed if the total score for all statements is ≥17 [12].

The Indonesian version of the SAS created and validated by Setyowati *et al.* was used to assess anxiety. The analysis of convergent validity showed a positive relationship between each item and the overall score. Reliability assessments yielded a Cronbach's alpha of 0.691 and an ROC value of 36.5, with sensitivity assessed at 0.682 and specificity at 0.616. This instrument consists of 20 items that describe how often respondents feel or behave in

accordance with each statement. Assessments are based on a Likert scale with four quantitative terms: Never, sometimes, some of the time, and almost all of the time. Each item is scored as 1, 2, 3, and 4 for negative symptom items, and 4, 3, 2, and 1 for positive symptom items. Residents are considered to have anxiety if the total score for all statements is ≥37 [13].

The Indonesian version of the PHEEM, developed and validated by Raharjanti & Ramadianto was also employed. Nearly all items correlated with the total score, with r>0.3, and Cronbach's alphas of 0.89 and 0.91, respectively, from two data collection sessions [14]. This instrument consists of 40 questions. Residents must rate their feelings about their position in the hospital, reflecting how often they feel or behave in accordance with the statements. Assessments are based on a Likert scale with scores ranging from 4 (strongly agree), 3 (agree), 2 (uncertain), 1 (disagree), to 0 (strongly disagree). The PHEEM is grouped into three domains: Perception of role autonomy (14 items), with a maximum score of 56; Perception of teaching (15 items), with a maximum score of 60; and Perception of social support (11 items), with a maximum score of 44. A total score exceeding 80 indicates a satisfactory learning environment.

Data collection

Google Forms were employed, which consisted of five parts, including informed consent, sociodemographic characteristics of the subjects, the BDI-II, the SAS, and the PHEEM. Sociodemographic data included gender, age, residency level, length of study, marital status, and education costs. The research was conducted in accordance with the principles outlined in the Declaration of Helsinki.

Statistical analysis

All data were analyzed using SPSS 25. The influence of perceptions of the clinical learning environment (PHEEM) on symptoms of depression (BDI-II) and anxiety (SAS) was assessed using linear regression analysis. Mediation or path analysis was conducted using linear regression and the Sobel test to determine the pathway of influence from the clinical learning environment on depression and anxiety. All results of the statistical analyses were considered significant when p<0.05.

Findings

The average age of the participants was 30.28 years (range: 26.6-37.6 years). There were 42 female residents (63.6%), with most participants at the junior residency level (54.4%) and the majority in their 5th semester (18.2%). Based on marital status, 47 (71.2%) residents were married, and one resident was divorced.

Based on the BDI-II and SAS scores, symptoms of depression alone were found in 6 (9.1%) residents, 8 (12.1%) residents experienced symptoms of anxiety alone, and 4 (6.1%) residents experienced symptoms of depression accompanied by anxiety. The remaining residents did not exhibit symptoms of depression or anxiety.

Table 1. Sociodemographic characteristics of participants

Parameter	Frequency (%)
Sex	
Male	24 (36.4)
Female	42 (63.6)
Residency level	
Junior	36 (54.5)
Senior	30 (45.5)
Semester	
1	4 (6.1)
2	10 (15.2)
3	10 (15.2)
4	11 (16.7)
5	12 (18.2)
6	11 (16.7)
7	6 (9.1)
8	2 (3.0)
Marital status	
Unmarried	18 (27.3)
Married	47 (71.2)
Divorced	1 (1.5)
Education cost	
Personal	46 (69.7)
Scholarship	20 (30.3)

The mean score for the BDI-II was 9.68, with a range from 0 to 29, while the SAS had a mean score of 32.77, ranging from 20 to 47. The total PHEEM score averaged 107.65, with a range of 30 to 151, indicating a satisfactory learning environment. The specific components showed a mean role of autonomy score of 37.48 (range 1 -55), a teaching score of 42.53 (range: 8-60), and a social support score of 27.64 (range: 11-39; Table 1).

Table 2. Residents' perceptions of the clinical learning environment

Parameter	Frequency (%)
Total perception	
Very poor	2 (3)
Plenty problems	9 (13.6)
More positive than negative, needs improvement	38 (57.6)
Excellent	17 (25.8)
Perception of autonomy role	
Poor	2 (3)
Negative view of one's role	7 (10.6)
More positive perception	41 (62.1)
Excellent	16 (24.2)
Perception of teaching	
Poor	2 (3)
Need retraining	8 (12.1)
Moving right direction	25 (37.9)
Model teacher	31 (47)
Perception of social support	
Non-existent	2 (3)
Not pleasant	6 (9.1)
More pros than cons	49 (74.1)
Good support	9 (13.6)

Thirty-eight residents (57.6%) reported "more positive than negative, needs improvement" regarding their overall perception of the PHEEM. Most residents (62.1%) scored "more positive

perceptions” in their perception of role autonomy. The most common perception of teaching was that of a “model teacher” (47%). Meanwhile, in the aspect of perceived social support, 49 (74.1%) residents scored “more pros than cons” (Table 2).

Perceptions of social support within the clinical learning environment significantly influenced depression symptoms; the better the clinical learning environment, the lower the level of depression. However, residents’ perceptions of the clinical learning environment, in terms of total perception, role autonomy, teaching, and social support, did not influence anxiety symptoms (Table 3).

Based on the Sobel test, anxiety was not a significant mediator between the influence of perceptions of the clinical learning environment and depression symptoms. The significant influence of perceptions of social support on depression symptoms likely occurred directly, without anxiety serving as a mediator.

Depression significantly mediated the influence of social support aspects in the clinical learning environment on anxiety (Z=-2.03; p=0.042). The negative sign indicates a statistically significant indirect effect in a negative direction; that is, if social support increased, anxiety symptoms decreased through a reduction in depression symptoms (Table 4).

Table 3. Influence of perceptions of the clinical learning environment on depression and anxiety symptoms

Parameter	Coefficient (B)	Standard error	t	p-Value
BDI-II				
Total perception	-0.005	0.033	-0.158	0.875
Perception of autonomy role	0.193	0.306	0.631	0.530
Perception of teaching	0.190	0.235	0.809	0.421
Perception of social support	-0.661	0.286	-2.310	0.024
SAS				
Total perception	-0.003	0.025	-0.114	0.910
Perception of autonomy role	-0.057	0.237	-0.239	0.812
Perception of teaching	0.032	0.182	0.178	0.860
Perception of social support	0.010	0.222	0.046	0.963

BDI-II: Beck Depression Inventory-II; SAS: Zung Self-Rating Anxiety Scale

Table 4. Effect of the clinical learning environment on depression and anxiety symptoms using mediator parameters

Path	Coefficient	Standard error	Sobel Z	p-Value (2-tailed)
Anxiety				
Total perception → anxiety	-0.03	0.025		
Anxiety → depression	0.636	0.148	-0.11	0.90
Autonomy role → anxiety	-0.057	0.237		
Anxiety → depression	0.636	0.148	-0.24	0.81
Teaching → anxiety	0.032	0.182		
Anxiety → depression	0.636	0.148	0.17	0.86
Social support → anxiety	0.01	0.222		
Anxiety → depression	0.636	0.148	0.04	0.96
Depression				
Total perception → depression	-0.005	0.033		
Depression → anxiety	0.352	0.082	-0.15	0.88
Autonomy role → depression	0.193	0.306		
Depression → anxiety	0.352	0.082	0.62	0.53
Teaching → depression	0.19	0.235		
Depression → anxiety	0.352	0.082	0.79	0.43
Social support → depression	-0.661	0.286		
Depression → anxiety	0.352	0.082	-2.03	0.04

Discussion

This study aimed to determine the prevalence of depression and anxiety symptoms in pediatric residents and their perceptions of the clinical learning. We utilized the BDI-II to identify depressive symptoms and the SAS to identify anxiety symptoms. Symptoms of depression were found in 10 (15%) residents, and 4 of these were accompanied by symptoms of anxiety. This prevalence of depression is higher than the results of the Indonesian Health Survey in 2023, reporting a depression rate of 2% in the 15-24 age group and 1.3% in the 25-34 age group [15]. In this study, 12 (18.2%) residents experienced anxiety symptoms, 4 (6.1%) of whom also had depressive symptoms. This figure exceeds the prevalence of anxiety disorders in the global population, which is 4.05%, or approximately 301 million people [16]. These findings suggest that physicians and residents are at greater risk of depression compared to the general population due to their work pressures and the academic demands of residency education [1, 2, 17]. Studies in various countries show that the prevalence of depression in residents ranges from 7.7% to 93% [17], while the incidence of anxiety in residents varies from 10% to 63.9% [6, 8, 17]. These differences in prevalence rates may be attributed to variations in environmental conditions, the background characteristics of residents, and differences in the psychometric instruments used to assess depression and anxiety symptoms. Four (6.1%) residents experienced symptoms of depression accompanied by anxiety. A

WHO health survey reported that 45.7% of individuals with major depressive disorder have a history of one or more anxiety disorders [18]. The most likely explanation is that anxiety disorders and depression are hereditary and can be inherited, with evidence suggesting a shared genetic risk for both disorders [19].

The average PHEEM score for total perceptions of the clinical learning environment was 107.65. Comparable results are reported in research conducted in Indonesia [20, 21] and in other countries [22, 23]. However, our score was higher than those reported in Sri Lanka [24], Pakistan [25], and Kenya [1]. Analysis of PHEEM scores among the majority of residents suggests a positive perception of the hospital's clinical learning environment. Most studies have revealed a more positive interpretation of the learning environment than a negative one, although there is still room for improvement [20-23, 26]. Research in Kenya found that most residents perceive their learning environment as very poor, with numerous problems [1]. Differences in scores and interpretations of PHEEM may be caused by variations in access to educational opportunities, workload, experience, psychological conditions, and the location of teaching hospitals at each level of education, which differ between countries [27].

There was a significant influence of perceptions of the clinical learning environment on the social support aspects of depression symptoms based on BDI-II scores; namely, the better the clinical learning environment, the lower the level of depression. However, no influence was found regarding perceptions of the clinical learning environment on total perceptions, the role of autonomy, or teaching in relation to depressive symptoms. The findings of this research are comparable to those of Shah *et al.*, indicating a significant negative correlation between social support and depression. This result suggests that greater levels of social support could serve as a safeguard against depression [1].

Meanwhile, perceptions of clinical learning environments had no significant influence on anxiety symptoms, as measured by SAS scores, including total perception, role autonomy, teaching, and social support. These results differ from previous research, finding a relationship between clinical learning environments and anxiety symptoms, indicating that a worse clinical learning environment is associated with greater anxiety [28, 29]. The distinction between this study and earlier studies may arise from residents who internalize stress, perceiving their challenges as personal failings, making them more vulnerable to depressive symptoms. In contrast, residents who express their stress by attributing it to external factors, such as the hospital setting, might experience fewer or even no depressive symptoms. Moreover, receiving social support from family, friends, and partners likely assists them in managing stress and mitigating or alleviating symptoms of depression and anxiety [1].

This study conducted a mediation analysis of the influence of perceptions of the clinical learning environment on depressive symptoms, using anxiety symptoms as a mediator.

The statistical analysis found that the mediating parameter, anxiety, did not significantly bridge the influence between perceptions of the clinical learning environment and depressive symptoms. These results indicate that perceptions of social support significantly influence depressive symptoms, possibly directly, without anxiety serving as a mediator.

Furthermore, we analyzed the influence of perceptions of clinical learning environments on anxiety symptoms, using depressive symptoms as a mediator. Depression significantly mediated the effect of social support on perceptions of clinical learning environments regarding anxiety. This means that increasing social support will decrease anxiety by reducing depression. Other studies show that anxiety disorders and depressive disorders are bidirectional risk factors; all types of anxiety disorders can predict future depressive disorders, and all depressive disorders can predict future anxiety disorders [30, 31].

The perception of social support within the clinical learning context affected symptoms of anxiety and depression, both directly and indirectly. The average PHEEM score for the social support aspect was lowest for statement number 20, which stated, "This hospital has good quality accommodation for doctors, especially when on call," and number 26, which stated, "There are adequate catering facilities when I am on call." In contrast, the highest average social support score was for statement number 16, which stated, "I have good collaboration with other doctors at my level." Similar results were found in research conducted in Indonesia [20, 21] and in a systematic review by Chan *et al.* [27].

To date, residency programs have primarily focused on curriculum and academic standards, often neglecting crucial aspects such as accommodations and catering services. Nonetheless, the quality of housing and the availability of adequate meals significantly influence the comfort and welfare of residents during their training. Improving these aspects requires collaboration and consideration from multiple parties, including faculty and hospital management. However, the findings of studies on this condition should serve as an important reminder that resident comfort also deserves priority.

The limitation of this study is that it does not explore the psychological background of residents, family issues, and financial problems in depth, which are essential factors contributing to depression and anxiety and can influence perceptions of the clinical learning environment.

Conclusion

The perception of social support within the clinical learning environment has a significant direct influence on depressive symptoms and an indirect influence on anxiety through the mediation of depressive symptoms.

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