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Study on the Influence of Learning Environment on Mental Health of Medical Students Based on DREEM Scale and GHQ-12 Scale

Han Ruihong[1], Wei Hui Suan[2], & Liu Yunlong[3]

Faculty of Education and Liberal Studies, City University, Malaysia.

Abstract: *This study aims to explore the mechanisms through which learning environments influence mental health in medical students. Against the backdrop of increasing academic pressure in medical schools, we conducted a cross-sectional survey using the Dundee Ready Education Environment Measure (DREEM) and General Health Questionnaire-12 (GHQ-12) among 143 medical students. Through detailed data analysis, we sought to reveal the intrinsic connections between various dimensions of learning environments—including students' perceptions of academic learning, teacher evaluations, academic self-awareness, social self-perception, and academic self-perception—and mental health status. The results demonstrated a significant correlation between positive perceptions of learning environments and lower levels of psychological distress, particularly evident in social self-perception. This indicates that positive teacher-student relationships, active peer interactions, and supportive learning atmospheres play crucial roles in maintaining medical students' mental health. Not only does this study quantify the impact of learning environments on medical students' mental health, but it also delves into their underlying mechanisms, emphasizing the urgency and importance of improving these environments. The findings provide valuable reference for administrators of higher medical education. This research provides actionable recommendations for developing targeted interventions to holistically enhance medical students' mental health, thereby promoting their healthy development and well-rounded growth. The study suggests implementing comprehensive measures including cultivating positive teacher-student interactions, establishing supportive peer networks, and refining curriculum design with evidence-based teaching methods. These coordinated efforts will create an optimized learning environment that lays a solid foundation for nurturing future healthcare professionals with sound character and strong psychological resilience.*

Keywords: *learning environment, mental health, medical students, DREEM scale, GHQ-12*

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I. Introduction

As the primary setting for daily academic and social activities, learning environments critically shape college students' mental health. A supportive learning environment provides emotional support, access to resources, and practical opportunities that enhance coping abilities and psychological resilience(Jin, 2024). Conversely, negative learning environments may exacerbate mental health issues and lead to more severe consequences (Li, 2025). Recent studies have increasingly focused on the relationship between learning environments and student mental health, aiming to uncover the mechanisms through which different environmental factors influence psychological well-being(Dong et al., 2025).

This study focuses on medical students to explore the impact of learning environments on their mental health. Through analyzing survey data from 143 medical students in Henan Province, we examine how various dimensions of learning environment—such as students' perceptions of academic learning, teacher evaluations, academic self-awareness, social self-perception, and academic self-evaluation—relate to mental health status. The findings aim to provide scientific evidence for improving learning environments and enhancing mental health, while offering references for higher medical education administrators to formulate policies. Additionally, this research will encourage medical students to prioritize their mental well-being, proactively seek support, and better navigate academic and life challenges, ultimately achieving holistic development.

2.Research Background and Significance

2.1 Research Background

In the context of rapid development in higher education, mental health issues among college students have become increasingly prominent, emerging as a significant social concern (Jianghua1 et al., 2025). College students are at a critical transition period from adolescence to adulthood, facing multiple challenges including academic pressure, interpersonal relationships, and career development—all of which may negatively impact their mental well-being(Ning & Yu, 2024). Of note is that medical students, due to the unique demands of their profession, endure greater stress than students in other fields(Tan & Yang, 2025). On one hand, the vast and complex medical knowledge system requires substantial time and effort in learning. On the other hand, clinical internships expose them to real patients and complex medical conditions, potentially triggering anxiety, fear, or even trauma (Limeng et al., n.d.). Additionally, concerns about future career development—such as intense job competition and strained doctor-patient relationships—may further exacerbate their psychological stress (Deng & Ren, 2025). Research indicates that prolonged exposure to high-pressure environments makes medical students more susceptible to mental health issues like anxiety, depression, insomnia, and even burnout. These

problems not only affect academic performance and personal growth but may also negatively impact their future careers (Yue et al., 2025). Therefore, it is of great theoretical and practical significance to pay attention to the mental health of medical students and explore the key factors affecting their mental health.

As the primary setting for daily academic and social activities, the learning environment plays a pivotal role in shaping college students mental health. This environment encompasses both visible elements like classroom interactions and peer relationships, as well as invisible components such as institutional culture, administrative systems, and support services. A positive learning environment provides emotional support, access to resources, and practical opportunities that enhance students coping abilities and psychological resilience (Zhan & Yan, 2024). For instance, teachers' encouragement and guidance boost students' confidence, peer support alleviates loneliness, while counseling services and career guidance address real-world challenges. Conversely, negative environments may exacerbate mental health issues and lead to severe consequences (Yu & Guo, 2024). Excessive academic pressure, strained teacher-student relationships, and a lack of supportive campus culture can all contribute to anxiety and depression among students.

2.2 Research Significance

In recent years, growing research has focused on the relationship between learning environments and mental health among college students, aiming to uncover how different environmental factors influence psychological well-being(Wang et al., 2024). Studies show that positive learning environments can significantly reduce anxiety and depression levels while enhancing life satisfaction and happiness (EBSCOhost, n.d.). However, other research indicates that negative elements in academic settings—such as academic pressure and interpersonal conflicts—are closely linked to mental health issues(Yang, 2024). Nevertheless, current studies on the impact of learning environments on medical students' mental health remain relatively limited, particularly lacking in-depth exploration of how various dimensions of these environments correlate with students' psychological states (Zhang & Wu, 2024).

This study focuses on medical students to explore the impact of learning environments on their mental health. Through analyzing survey data from medical college students, we examine how various dimensions of learning environment—such as students' perceptions of academic learning, teacher evaluations, academic self-awareness, social self-perception, and academic self-evaluation—relate to mental health status. The findings provide scientific evidence for improving learning environments and enhancing mental health, while offering references for higher medical education administrators to formulate policies. Additionally, this research aims to encourage medical students to prioritize their psychological well-being, guide them to proactively seek support, and better address academic and life challenges, ultimately achieving holistic development.

3.Research object and method

3.1 Research subjects

This study selected 143 students from Henan Medical College as research subjects, comprising 49 males (34.27%) and 94 females (65.73%). The majority (82.52%) were aged 20-23. Ethnic Han students constituted 99.3%, with 73.43% hailing from rural backgrounds and 87.41% from dual-parent households. Junior year students accounted for the largest proportion at 74.83%.

3.2 Research Tools

This study adopted a structured questionnaire survey method to collect the general demographic data, learning environment perception and mental health status of the subjects. The questionnaire mainly included the following three parts:

General Information Questionnaire: This questionnaire collects essential data about participants, including gender, age, ethnicity, current academic grade, place of origin, family background, educational qualifications obtained, and student category. These baseline details will serve as control variables in subsequent statistical analyses to eliminate their potential influence on research outcomes.

DREEM (Dundee Ready Education Environment Measure) scale: used to assess medical students' perception of the learning environment. The DREEM scale consists of 50 items using a Likert five-point scale (1=very disagree, 5=strongly agree), covering five dimensions:

Students Perception of Learning (SPL): Evaluates students' overall assessment of course content, teaching methods, and learning experiences. Students Perception of Teachers (SPT): Assesses students' evaluations of teacher's instructional competence, teaching attitudes, and teacher-student relationships. Students' Academic Self-Perceptions (SASP): Evaluates students' assessments of their academic capabilities, learning motivation, and academic achievements. Students Social Self-Perceptions (SSSP): Evaluates students' perceptions of campus social atmosphere, interpersonal relationships, and sense of belonging. Students Learning Environment (SLE): Evaluates students' assessments of learning resources, support services, and academic atmosphere.

The Cronbach alpha coefficient of DREEM scale is above 0.80, which has good reliability and validity.

GHQ-12 (General Health Questionnaire): A standardized tool for assessing mental health in medical students. This 12-item screening instrument uses a four-point Likert scale (1=never, 4=often) to evaluate psychological distress levels over the past few weeks. The GHQ-12 scale effectively measures mental health issues including anxiety, depression, insomnia, and impaired social functioning. With a Cronbach salpha coefficient exceeding 0.70, it demonstrates strong

reliability and validity.

3.3 Data collection

This study employed an online questionnaire survey method to collect data. First, research permission was obtained by contacting relevant administrators at medical schools. Subsequently, the questionnaire link was posted in medical students' class or grade-specific groups, inviting eligible students to participate voluntarily. On the questionnaire homepage, researchers provided detailed explanations of the study's objectives, significance, and data confidentiality measures to ensure informed consent. After completing the questionnaires, researchers conducted preliminary data review, excluding invalid responses, ultimately incorporating 143 valid questionnaires.

3.4 Data analysis

This study employed SPSS26.0 statistical software for data analysis. First, descriptive statistics were conducted on the general demographic characteristics of participants, including calculating mean values, standard deviations, frequencies, and percentages. Second, independent samples t-tests and ANOVA were used to compare score differences between medical students with different demographic characteristics on the DREEM scale and GHQ-12 scale. Third, Pearson correlation analysis was performed to explore correlations between dimensions of the DREEM scale and the total score of the GHQ-12 scale. Finally, multiple linear regression analysis was conducted to examine the predictive role of DREEM scale dimensions in med students' mental health status. All statistical analyses adopted a significance level of $p<0.05$ to determine statistically significant differences.

The total average score of GHQ-12 scale was 231.86. The results showed that medical students had lower scores on items such as "feeling unhappy and depressed" (average score 2.01), "losing confidence in themselves" (average score 1.94), and "believing they are worthless" (average score 1.82). This indicates that while the overall mental health status of medical students is good, there are still some issues regarding self-worth and emotional well-being.

In addition, students scored lower on items such as "always feel nervous" (average score 2.14) and "feel unable to overcome difficulties" (average score 2.1), indicating that some students have a certain sense of anxiety and helplessness.

On positive measures, medical students demonstrated strong cognitive performance and decision-making capabilities through higher scores in items such as "Can you focus on whatever you're doing?" (average score 3.5), "Do you feel capable of making decisions about things?" (average score 3.3), and "Are you able to enjoy your daily activities?" (average score 3.25).

4. Research Findings

4.1 DREEM scale analysis

DREEM Scale: Overall, medical students demonstrate positive evaluations of their learning environment, with high average scores across all subscales. Specifically, regarding academic learning perception (SP), students generally agree that classroom teaching helps maintain focus (average score 4.34), instructors provide timely feedback (average score 4.36), and teachers exhibit strong communication skills (average score 4.36). In teacher perception (TP), students rate educators as knowledgeable (average score 4.41), deliver clear case studies (average score 4.38), prepare thorough lessons (average score 4.43), and show patience (average score 4.29). Academic self-perception (SA) shows students can retain required knowledge (average score 4.08), apply professional knowledge effectively (average score 4.3), and are well-prepared for career development (average score 4.1). Social self-perception (SS) highlights relaxed classroom atmosphere (average score 4.24), abundant opportunities to develop interpersonal skills (average score 4.24), and a balance between learning enjoyment and academic pressure (average score 4.18). Academic self-perception (LS) indicates students clearly understand course objectives (average score 4.21) and feel free to ask questions in class (average score 4.17).

4.2 GHQ-12 scale analysis

The total average score on the GHQ-12 scale was 231.86. Analysis of individual items revealed lower scores for "feeling unhappy and depressed" (average 2.01), "losing confidence in oneself" (average 1.94), and "feeling worthless" (average 1.82). These findings indicate that while medical students generally maintain good mental health, they still face challenges in self-worth perception and emotional well-being.

4.3 Correlation analysis between learning environment and mental health

Analysis of questionnaire data suggests that items with higher scores on the DREEM scale (e.g., "teachers possess extensive knowledge" and "a relaxed classroom atmosphere") show a negative correlation with the total GHQ-12 score, indicating that a more positive perception of the learning environment correlates with better mental health. Conversely, items with lower DREEM scores (e.g., "teachers mock students" and "I am disappointed in my classroom experience") demonstrate a positive correlation with the GHQ-12 total score, suggesting that a more negative perception of the learning environment is associated with poorer mental health.

4.4 Conduct in-depth analysis based on specific items

Extensive Teacher Knowledge (DREEM16): Students generally report that teachers possess extensive knowledge (average score 4.41), which enhances their trust and sense of identification with educators, thereby boosting learning interest and motivation. Laid-back

Classroom Atmosphere (DREEM34): Students predominantly describe relaxed classroom environments (average score 4.24), which helps alleviate stress and anxiety while encouraging active participation in class interactions. Can You Focus on What You Are Doing? (GHQ-121): Medical students consistently report being able to concentrate on their tasks (average score 3.5), indicating strong cognitive performance that enables effective handling of academic responsibilities.

Teachers mock students (DREEM20): While students generally rate the learning environment positively, some report teachers might mock them (average score 2.77), indicating potential issues in teaching methods that require attention. Disappointment with classroom experience (DREEM39): Similarly, despite overall positive evaluations, some students express dissatisfaction with classroom interactions (average score 2.78), suggesting room for improvement in teaching practices. Feeling unhappy and depressed (GHQ-129): Students scored low on the "feeling unhappy and depressed" item (average score 2.01), highlighting emotional health concerns that demand attention.

Loss of confidence in oneself (GHQ-1210): Students scored low on the item "loss of confidence in oneself" (average score 1.94), indicating that some students have some problems in self-worth and need psychological counseling.

5.Discuss

The findings of this study indicate that medical students generally hold positive perceptions of their learning environments. However, it is noteworthy that despite the overall positive evaluation, the survey data reveals existing mental health issues among medical students, which aligns with the stress commonly faced by college students today. A positive learning environment—particularly strong teacher-student relationships and peer interactions—has been proven to significantly enhance medical students' sense of belonging and identity, thereby alleviating their stress levels and promoting overall psychological well-being. Nevertheless, the research data also highlights that there remain numerous details requiring attention and improvement in building an idealized positive learning environment.

5.1 The positive role of learning environment

Teachers Support and Encouragement: A teacher's extensive knowledge, clear delivery of lectures, thorough lesson preparation, and patient problem-solving not only serve as vital channels for students to acquire knowledge, but also help boost their learning interest and confidence while igniting intrinsic motivation. Data shows that most students highly value teachers' professional competence and teaching skills, which undoubtedly fosters a positive learning environment and strengthens their resolve to overcome academic challenges.

A positive classroom atmosphere: A relaxed and enjoyable learning environment with ample opportunities for student participation and respect for their opinions not only enhances engagement and a sense of belonging, but also ignites students' passion for learning and creativity. In such an environment, students are no longer passive recipients of knowledge, but active contributors to its construction. This approach enables them to gain deeper learning experiences and a greater sense of accomplishment.

Positive peer relationships: Well-established friendships, vibrant social activities, and a supportive learning environment that fosters mutual care not only help alleviate students' loneliness and stress but also enhance their social adaptability and interpersonal skills. In such caring communities, students can better tackle academic and life challenges, maintain an optimistic outlook, and promote healthy psychological development.

5.2 Strategies to improve the learning environment.

Enhancing teacher-student interaction and building harmonious relationships: Educators should proactively address students' individual differences and psychological needs, offering personalized guidance and support that goes beyond mere knowledge transmission. By establishing a new type of teacher-student relationship characterized by both mentorship and friendship, we can strengthen students trust and sense of belonging towards their teachers, thereby igniting their passion for learning, and fostering intrinsic motivation.

Fostering peer collaboration and cultivating a supportive learning environment: Actively organize students to participate in diverse peer activities such as study groups and experience-sharing sessions, encouraging mutual assistance and support among students for collective growth. By building a collaborative learning atmosphere, we can not only enhance students' academic performance but also strengthen their teamwork awareness and interpersonal communication skills.

Enhance support systems and deliver comprehensive psychological assistance: Establish a robust counseling service system to provide students with timely and effective mental health support. Simultaneously, strengthen mental health education for students to improve their ability to identify and address psychological issues, guiding them to proactively seek help. This approach effectively prevents and resolves mental health challenges while fostering proactive self-care habits.

Fostering a Positive Environment and Building a Harmonious Campus Culture: To cultivate an uplifting campus culture, we must not only emphasize academic atmosphere but also prioritize students' holistic development. By organizing diverse campus activities, we can strengthen students' sense of belonging and identity, thereby igniting their passion for loving and contributing to the school, ultimately promoting harmonious campus growth.

6.Research conclusions and enlightenment suggestions

6.1 Research conclusions

This study deeply explored the influence of learning environment on the mental health of medical students. Through the survey and analysis of 143 medical students' perception of learning environment and mental health status, the following conclusions were drawn:

While medical students generally report positive evaluations of their learning environments, mental health challenges remain significant and multifaceted. The DREEM scale indicates that most students maintain favorable perceptions across all dimensions—including academic, teacher-related, social, and self-perception aspects. However, the GHQ-12 assessment reveals that a substantial number of students experience psychological distress in areas such as self-worth, emotional regulation, and interpersonal relationships. This suggests that even in seemingly supportive academic settings, mental health issues persist among medical students, often manifesting in more subtle and diverse forms that demand urgent attention. Furthermore, the data highlights that these psychological challenges stem from a complex interplay of factors such as academic pressure, interpersonal dynamics, and career development concerns. Therefore, implementing comprehensive interventions is essential to effectively enhance the mental health of medical students.

Positive learning environment factors play multiple roles in promoting medical students' mental health, with distinct mechanisms at play. Teacher support and encouragement, a relaxed classroom atmosphere, and positive peer relationships not only strengthen students' sense of belonging and identity but also stimulate their academic interest, enhance learning efficacy, and improve stress management capabilities—thereby comprehensively boosting mental well-being. Specifically: Teachers extensive knowledge, clear teaching delivery, thorough lesson preparation, and patient problem-solving help boost students' enthusiasm and confidence, igniting their intrinsic motivation. A relaxed classroom environment with ample questioning opportunities and respect for student feedback enhances participation and sense of belonging, encouraging active engagement in class interactions. Meanwhile, positive peer relationships, diverse social activities, and supportive learning communities alleviate loneliness and stress, improving social adaptability and interpersonal skills—ultimately helping students better integrate into campus life.

Negative environmental factors in learning environments can significantly impact medical students' mental health, with the severity and manifestations varying across different causes. Teachers mocking behaviors, classroom disappointment, and excessive academic pressure may damage students' self-esteem and confidence, diminish their motivation to learn, and even lead to psychological issues like anxiety and depression. Teachers' sarcastic remarks might make students feel ashamed and helpless, thereby reducing their drive and self-assurance. Classroom

dissatisfaction could cause students to lose interest in studies, consequently lowering both academic performance and engagement. Chronic academic stress may keep students under prolonged tension, potentially triggering psychological problems such as anxiety and insomnia. Therefore, when creating a positive learning environment, its crucial to prioritize addressing these negative factors and implement effective measures to prevent and eliminate them.

Medical students with different demographic characteristics may exhibit significant differences in their perception of learning environments and mental health status, indicating the need to address the psychological needs of specific groups. Factor analysis results suggest that demographic variables such as gender, age, grade level, place of origin, and family circumstances may correlate with certain perceptions of learning environments. For instance, male and female medical students may differ in their perception of aspects like "well-structured teaching schedules" and "laid-back atmosphere in discussion sessions"; while students at different grade levels might show variations in their perception of "professorial expertise" and "clearly presented case studies in lectures". These differences highlight the importance of considering the unique needs of various groups when developing mental health interventions, ensuring targeted support and assistance tailored to each demographic.

6.2 Research implications and Suggestions

Based on the above conclusions, this study puts forward the following more targeted and operational implications and suggestions:

To establish a student-centered positive learning environment with holistic optimization and meticulous refinement, medical education administrators should prioritize curriculum design. This involves enhancing teacher-student relationships, cultivating a supportive classroom atmosphere, and promoting peer collaboration to provide comprehensive support for medical students. Such measures will strengthen their sense of belonging and identity, thereby reducing stress and improving mental health. Specifically, the following strategies should be implemented: (1) Optimizing course structures and teaching methodologies to boost classroom engagement; (2) Enhancing faculty training programs to elevate educators' instructional skills and psychological counseling capabilities; (3) Establishing a robust counseling system to deliver timely psychological support; (4) Organizing diverse campus activities to foster students' sense of community and professional identity.

Implement precision mental health intervention strategies that address the psychological needs of specific groups through personalized support. Tailored psychological support and interventions should be provided for medical students with different demographic characteristics. For example: Students from rural backgrounds could receive enhanced financial assistance and counseling to better adapt to university life; those from single-parent families may benefit from emotional support and care to build confidence and develop a positive outlook

on life; while students facing academic pressure could gain study skill guidance and time management training to improve learning efficiency and reduce stress.

Enhancing mental health education for medical students and improving their psychological literacy and self-care capabilities: Higher medical education institutions should integrate mental health education into their curriculum systems. By offering mental health courses, organizing mental health lectures, and arranging group counseling activities, these institutions can help students better identify and address psychological issues. Simultaneously, they should guide students to establish correct values and outlooks on life, cultivate a positive mindset, and strengthen their ability to cope with setbacks and stress. This comprehensive approach will ultimately elevate both their psychological well-being and self-care competencies.

To establish a collaborative mental health support network that integrates families, schools, and society: The mental health of medical students is influenced not only by academic environments but also by family and social factors. Therefore, we need to build a coordinated support system that connects these three key elements. Specifically, we should: (1) Strengthen communication with parents to understand their children's family situations and psychological needs, enabling collaborative support; (2) Enhance partnerships with mental health service providers to bring in professional counselors and therapists for tailored care; (3) Promote public awareness campaigns about mental health to raise societal attention to medical students' well-being and foster a supportive community environment.

Establish a regular mental health monitoring system to ensure early detection and intervention of psychological issues. Higher medical education institutions should implement routine mental health screenings for students, enabling timely identification of those with psychological concerns. Concurrently, comprehensive crisis intervention mechanisms must be developed to provide prompt and effective support for students experiencing psychological distress, thereby preventing the escalation of mental health problems.

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