

FROM CONTEXT TO VALIDATION: PSYCHOMETRIC EVALUATION OF THE CLINICAL LEARNING ENVIRONMENT TOOL IN PAKISTAN

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How to cite this article

Haq AU, Jamil B, Asim N, Ijaz M, Riaz S. From Context to Validation: Psychometric Evaluation of the Clinical Learning Environment Tool in Pakistan. J Gandhara Med Dent Sci. 2025;12(4):93-96. <https://doi.org/10.37760/jgm.12-4.774>

Date of Submission: 12-08-2025

Date Revised: 03-09-2025

Date Acceptance: 04-09-2025

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INTRODUCTION

The CLE is a complex system that covers the basics, influencing the professional growth of nursing students by fostering clinical judgment and critical thinking through their exposure to various aspects of patient care.¹ Despite its importance, nursing students often perceive the CLE as anxiety-inducing due to balancing their roles and tasks of learner and worker. The level of student satisfaction within the CLE is closely linked to several factors, including the quality of nursing care, supervision, mentorship, and interactions with their nursing instructors.² Recognizing the influence of the CLE, this research examines the factors that impact student satisfaction and the overall effectiveness of the clinical learning experience. Factors such as mentor expertise, ongoing feedback, clinical conferences, and

ABSTRACT OBJECTIVES

The purpose of this study was to establish the validity and reliability of the Clinical Learning Environment Tool (CLE-T) within the Pakistani culture and context.

METHODOLOGY

A quantitative descriptive study was conducted from June to November 2023. This study was conducted in two phases. Phase one focused on content validation using an online form, while phase two involved field testing and psychometric evaluation. The adapted 34-item tool was then administered to 392 nursing students from government colleges in Khyber Pakhtunkhwa, Pakistan, selected via probability random sampling. Reliability was assessed using Cronbach's alpha and item-total correlations, while construct validity was examined through exploratory factor analysis. Ethical approval and informed consent were obtained prior to the commencement of data collection.

RESULTS

The study prioritizes cultural alignment, content and construct validity, internal consistency, and test-retest reliability. Results demonstrate strong content validity with high Content Validity Index (CVI) and Content Validity Ratio (CVR) scores, supported by a Cronbach's Alpha coefficient of 0.980, indicating reliability. Factor analysis identifies three dimensions: supportive learning, communication, and learning scenario efficacy. The validated CLE-T emerges as a reliable resource for educators and policymakers, fostering effective clinical learning environments and skilled healthcare professionals.

CONCLUSION

The paper suggests broader validation across contexts and longitudinal exploration, affirming the CLE-T as a valuable tool for educators and policymakers.

KEYWORDS: Clinical Learning Environment, Student Satisfaction, Nursing Care Quality, Mentor/Preceptor, Nursing Teacher

the alignment of theory and practice emerge as critical determinants of student satisfaction. Additionally, the study acknowledges the significance of appreciation and support in shaping positive clinical experiences, which surpasses the influence of the physical environment.^{3,4} Against this background, the recent emphasis on enhancing the quality of CLE underscores the need for an educational shift and a stronger integration between academic coursework and on-the-job training, as reflected in the adoption of various supervision models. To address the gaps in understanding the CLE's impact in the Pakistani context, this research focuses on adapting and validating the Clinical Learning Environment Tool (CLE-T).^{7,8} The unique cultural and contextual factors in Pakistan, including cultural beliefs, socio-economic status, language barriers, and resource limitations,

necessitate an examination of the validity and reliability of assessment tools.^{9,10} This study aims to fill the gap by validating and adapting the Clinical Learning Environment Tool (CLE-T) for use in Pakistan. Ensuring its reliability and validity in this context will help improve healthcare education, allowing for a better evaluation of clinical environments and ultimately enhancing student satisfaction and learning outcomes in Pakistani nursing programs.^{11,12,13}

METHODOLOGY

A quantitative descriptive design was used in two phases. Phase one focused on content validation using an online form, while phase two involved field testing and psychometric evaluation. The study was conducted at the Government Colleges of Nursing in Khyber Pakhtunkhwa. This study was conducted from June 2023 to November 2023, following approval from the Khyber Medical University Advanced Studies and Research Board (KMU-AS&RB) at its 135th meeting, vide letter No.DIR/KMU-AS&RB/DE/002043 dated May 31, 2023. The AS&RB approval certificate was granted vide No.DIR/KMU-AS&RB/DS/002038 dated 09-10-2023. The study was carried out after approval from the KMU-IHPER Ethics Board vide Ethical Clearance Certificate Ref No:1-11/IHPER/MHPE/KMU/23-22 dated 13-06-2023. A random sampling method was employed, adhering to standard practices that suggest a requirement of 10 participants per item. With a total of 34 items included, this resulted in a target sample size of 340 participants.¹⁴ To account for potential missing data, a total of 392 participants were selected using probability random sampling. The inclusion criteria consisted of currently enrolled 5th and 6th-semester nursing students in Pakistan who had completed at least one clinical rotation. Exclusion criteria included students not enrolled in the specified semesters or those unable or unwilling to provide informed consent. Data collection was conducted through an online questionnaire distributed via email and WhatsApp groups. The questionnaire, adapted for the research context, collected demographic information and feedback on the Clinical Learning Environment Tool (CLE-T). The Content Validity Index (CVI), BSI, and UR were analyzed using Excel, and the results were presented in tables.

RESULTS:

All study participants were female, with ages ranging from 21 to 25 years. All are BS Nursing students of four different colleges of KP, Pakistan.

Table 1: Content Validity Index (CVI) Content Validity Ratio (CVR)

Total Items	Content Validity Index	Content Validity Ratio
47	1.38	1.76
51	1.5	2.0
54	1.58	2.17
56	1.64	2.29
61	1.79	2.58
63	1.58	2.7
64	1.88	2.76
151	4.44	7.88

Table 1 presents a summary of the Content Validity Index (CVI) and Content Validity Ratio (CVR) for each item. Each row corresponds to a specific item, with columns indicating the total items, CVI, and CVR values.

Table 2: Case Processing Summary

		N	%
Cases	Valid	392	100.0
	Excluded	00	0.0
	Total	392	100.0

Table 2 presents the reliability analysis results, indicating that 392 cases were included in the analysis, and no cases were excluded. The analysis employed list-wise deletion across all variables.

Table 3: Reliability Statistics

Reliability Statistics	
Cronbach's Alpha	Cronbach's Alpha
0.98	0.98

The study revealed a high Cronbach's Alpha of 0.980, indicating an exceptional level of internal consistency among the 34 items. This suggests that participants strongly agreed with each item, reflecting the reliability of the scale. Item-total correlations further confirmed the stability of the instrument, as no item deletion would have improved the alpha value. The data analysis involved two main components: Content Validity Index (CVI) and Content Validity Ratio (CVR), which assess the representation of items in a test or instrument. CVI measures the proportion of content-valid items, and CVR assesses expert consensus on the necessity of each item. In this study, 392 valid cases were analyzed, with no exclusions, denoting complete data for all variables. The subsequent reliability analysis, specifically Cronbach's Alpha, revealed a remarkably high internal consistency of 0.980, signifying strong reliability. The Item-Total Statistics provided insights into the correlations between individual items and total scores, revealing the impact of each item on the overall construct. Further scrutiny involved "Cronbach's Alpha if Item Deleted", indicating the impact of removing specific items on scale reliability. The Kaiser-Meyer-

Olkin (KMO) measure and Bartlett's test of sphericity were conducted to validate the dataset's suitability for factor analysis, and both tests demonstrated adequacy. The high KMO value of 0.934, along with significant relationships among variables ($p < 0.001$), supported the application of Principal Component Analysis. Extraction communalities ranged from 0.493 to 0.797, indicating substantial variance explanation. Exploratory Factor Analysis (EFA) using principal component analysis with varimax rotation revealed a three-factor structure. The first factor, Supportive Learning, encompassed reflecting feedback, encouragement, and guidance provided by clinical supervisors. The second factor, communication, represented clarity, accessibility, and interaction between students and faculty/staff in the clinical environment. The third factor, learning scenario efficacy, captured the appropriateness and effectiveness of clinical placements in facilitating meaningful learning experiences. Overall, the comprehensive analysis demonstrates robust validity, reliability, and suitability for factor analysis in the examined scale or questionnaire.

DISCUSSION

The findings from this comprehensive data analysis provide valuable insights into the validity, reliability, and suitability of the Clinical Learning Environment Tool (CLE-T) for factor analysis.¹⁵ The use of the Content Validity Index (CVI) and Content Validity Ratio (CVR) served as robust measures to assess the representation and necessity of items in the instrument. The absence of exclusions in the analysis, with 392 valid cases, underscores the completeness of data for all variables, enhancing the study's integrity. Content validity was initially established through the Content Validity Index (CVI) and Content Validity Ratio (CVR), with values ranging from 1.38 to 4.44 for CVI and 1.76 to 7.88 for CVR across different item pools. These findings suggest a high degree of expert consensus on item relevance and necessity. According to Polit and Beck, CVI values above 0.78 are considered acceptable for scale development, while higher CVR values confirm strong agreement on item inclusion.¹⁶ In this study, the elevated CVI and CVR values indicate that the items comprehensively captured the intended constructs, ensuring that the tool reflects the essential components of the clinical learning environment. Reliability analysis further reinforced the instrument's robustness. The Cronbach's Alpha coefficient of 0.980 is significantly above the threshold of 0.70 recommended by Nunnally and Bernstein, denoting excellent internal consistency.¹⁷ This high reliability coefficient indicates the reliability of the measurements, affirming the consistency of responses

across the surveyed items. The exploration of Item-Total Statistics further clarifies the relationships between individual items and the overall construct, providing insight into the impact of each item on the total score. Moreover, the "Cronbach's Alpha if Item Deleted" provided valuable perspectives on how specific items might impact the overall reliability of the scale. This approach can help identify items that could be refined or eliminated in future iterations to enhance the instrument's effectiveness. The validation of the dataset's suitability for factor analysis through KMO and Bartlett's Test is crucial. The high KMO value of 0.934 indicates a substantial proportion of shared variance among variables, reinforcing the dataset's appropriateness for factor analysis. Bartlett's test, with a low p-value ($p < 0.001$), confirms the existence of significant relationships between variables, further supporting the decision to employ Principal Component Analysis. The dataset's suitability for factor analysis was verified using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity. The KMO value of 0.934 exceeds the recommended threshold of 0.80, indicating sampling adequacy.¹⁸ Moreover, the significant Bartlett's test ($p < 0.001$) confirmed the presence of sufficient inter-item correlations to justify exploratory factor analysis (EFA). These findings align with the psychometric criteria outlined by Tabachnick and Fidell.¹⁹ The communalities between 0.493 and 0.797 indicate the ability of the identified factors to explain substantial variance in most items, providing support for the chosen extraction method. This reinforces the factor structure revealed by Principal Component Analysis. The analysis establishes the validity, reliability, and suitability of the evaluated scale or questionnaire for factor analysis. The high internal consistency, detailed item-level insights, and rigorous validation procedures collectively enhance the methodological rigor, strengthening the credibility of the findings and supporting informed decisions regarding the refinement or application of the instrument in future research.

LIMITATIONS

While Cronbach's alpha was the primary measure used, reliance on a single measure may overestimate internal consistency. Future validation studies of the CLE-T in Pakistan should incorporate such methods to substantiate the reliability claims further. Moreover, longitudinal investigations can be undertaken to scrutinize the tool's stability and consistency over time.

CONCLUSIONS

Our assessment confirms the Clinical Learning

Environment Tool's (CLE-T) strength in measuring the clinical learning environment. Through comprehensive content validity evaluation using the Content Validity Index (CVI) and Content Validity Ratio (CVR), the CLE-T established sensitive representativeness within its intended domain. The remarkable Cronbach's Alpha coefficient of 0.980 underscores the tool's exceptional internal consistency and reliability, reinforcing its efficacy for assessing the clinical learning environment. While Item-Total Statistics provided nuanced insights into item relationships, the observed minimal impact on reliability upon item exclusion suggests potential item redundancy. Nonetheless, the CLE-T emerges as a dependable instrument for evaluating the multifaceted dimensions of the clinical learning environment.

CONFLICT OF INTEREST: None

FUNDING SOURCES: None

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Samreen Riaz - Concept & Design; Data Acquisition; Data Analysis/Interpretation; Drafting Manuscript; Critical Revision; Final Approval

The authors accept responsibility for all aspects of the work and will ensure that any concerns regarding the accuracy or integrity of any part are properly investigated and resolved.



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