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Lasater clinical judgment rubric in nursing education: a Turkish validity and reliability study

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Abstract

Introduction Gaining clinical judgment competence among student nurses is a significant outcome of nursing education. In this education process, an assessment tool based on observable behaviors is needed for evaluating students' clinical judgment skills.

Objective This study aimed to evaluate the validity and reliability of the Turkish version of the Lasater Clinical Judgment Rubric, which assesses student nurses' stages of clinical judgment competency in simulation-based education.

Method This study was conducted using a cross-sectional methodological design between April and August 2024. For the cultural adaptation and psychometric evaluation of the rubric, simulation videos of 3rd and 4th-year nursing students from a foundation university were used. The language validity of the rubric was performed according to the 10-step translation and cultural adaptation guide of the International Society for Pharmacoeconomics and Outcomes Research; expert opinions were obtained for content validity. The final version of the rubric comprises four stages of the Tanner Model of Clinical Judgment (noticing, interpreting, responding, and reflecting) and 11 dimensions. Four levels of achievement describe the development of each of the 11 dimensions. Sixty-four scenario records of the simulation-based education of 4th -year students in the nursing undergraduate program of a foundation university were examined, and the students were evaluated by two independent observers using the Turkish version of the rubric. The construct validity of the scale was examined using confirmatory factor analysis, and reliability was measured using Cronbach's alpha coefficient. Interobserver agreement was analyzed using the kappa and intraclass correlation coefficients. Moreover, the discrimination of the rubric was evaluated using an independent samples t-test between the lower and upper 27% groups.

Results Confirmatory factor analysis revealed that the scale formed a four-factor structure of noticing, interpreting, responding, and reflecting in accordance with the original rubric. Furthermore, confirmatory factor analysis showed that the four-factor structure model had an acceptable and generally good fit and was statistically significant and valid. The fit indices for the model were calculated as $\chi 2/df = 1.70$, root mean square error of approximation = 0.06, comparative fit index = 0.94, and root mean square residual = 0.03. Kappa values ranged between 0.72 and 0.92, indicating a significant fit for all the items. The intraclass correlation coefficient values ranged between 0.70 and 0.90 and were statistically significant for all the items. The Cronbach's alpha value of the rubric was 0.91 and ranged between 0.80 and 0.84 in its subdimensions.

Conclusion Therefore, the Turkish version of the rubric is a valid and reliable tool for evaluating student nurses' clinical judgment competency in simulation-based training.

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Keywords Clinical judgment, Simulation training, Education, Nursing students, Validity, Reliability

Introduction

With the increasing number of acute and chronic patients, nurses are increasingly forced to make rapid decisions under conditions of uncertainty [1]. Failure to promptly recognize clinical deterioration is a critical factor leading to avoidable deaths later in life. Annually, 2.6 million deaths occur, mainly in low- and middle-income countries, and one in 10 patients is harmed during medical care [2]. Such negative outcomes can be prevented by nurses' ability to recognize signs of decline in patients and intervene early through clinical decision-making processes [3].

Clinical judgment refers to the nurse's ability to recognize significant problems, anticipate and interpret changes in the clinical situation, make decisions on the basis of various types of information, plan an appropriate intervention, evaluate the effectiveness of that intervention after implementing it [4]. Moreover, it refers to the cognitive processes that define clinical reasoning consistent with patients' health problems and needs by making sense of clinical judgment, data, and clues [5]. Therefore, clinical judgment plays a key role in nursing interventions and is an essential component of a competent nurse [4]. Among the competencies specified in the Guide to Core Competencies in Nursing published in 2021 in Turkey, the competency of making a judgment by integrating several elements is emphasized [6].

Tanner's [4] clinical judgment model was developed as an alternative approach to understanding clinical judgment, particularly suited to dynamic clinical situations. This model consists of four key components: perceiving the noticing, interpreting, responding, and reflection [4]. It has been applied as a framework for supporting the clinical judgment development of newly graduated nurses during their orientation period [7]. Clinical judgment is a critical competency that must be integrated into nursing education. To achieve this, nursing education should ensure a supportive clinical learning environment, comprehensive training, and effective learning strategies that foster critical thinking and bridge the gap between theory and practice [8]. The ultimate goal is for nursing students to graduate with a sufficient level of clinical judgment to deliver high-quality patient care. Various strategies and tools have been identified to enhance clinical judgment and measure its development, including debriefing, high-fidelity simulation, clinical judgment scripts, and reflective journaling [9–12]. Among these, simulation-based learning has been highlighted as a predominant focus in research aimed at improving nursing students' clinical judgment [13–15]. In nursing education, clinical and simulation applications are essential educational strategies for facilitating students' clinical judgment development [16, 17]. While implementing these strategies, evaluating students' level of clinical judgment and the knowledge gaps that hinder their judgment is essential. Educators should also evaluate the clinical judgment competence of student nurses in a multidimensional manner and take steps to eliminate the identified knowledge and skill deficiencies in terms of patient safety and quality of care.

The Lasater Clinical Judgment Rubric (LCJR) is a measurement tool used in nursing education to gain and evaluate students' competence in making clinical judgments. It has been proven to be an effective tool for assessing clinical decision-making through validity and reliability studies, as well as cross-cultural validation studies conducted in various languages, including Korean, Portuguese, Spanish, Dutch, and Chinese [15, 18–23].

In Turkey, to assess the clinical decision-making competence of student nurses in SBE, valid and reliable tools are needed. However, no tool has been developed to provide a multidimensional assessment of clinical judgment competence, and no Turkish version of the LCJR exists. This study aimed to assess the validity and reliability of the Turkish version of the LCJR.

Methods

Study design

This was a cross-sectional observational methodological study of instrument translation and validation.

Participants and setting

For the cultural adaptation and psychometric evaluation of the rubric, video recordings of the simulation experiences of 3rd and 4th -year students enrolled in the nursing department of a foundation university were used. The data for the study were collected between April and August 2024. Simulation experience videos of first- and second-year students were not included in the study because they did not yet have sufficient clinical knowledge. Randomly selected simulation experience videos from third-year students were used in the pilot phase.

The randomization process was conducted by a faculty member other than the researcher using a simple random sampling method, resulting in the selection of 8 videos. For fourth-year students, all 64 videos included in the scope of the Public Health Nursing course were examined in the primary validity and reliability processes. Public Health Nursing was chosen as it provides comprehensive simulation scenarios that align with the rubric's focus on evaluating clinical decision-making skills, while also considering the evaluator's expertise in this field.

The nursing education curriculum at the university where the study was conducted includes laboratory and clinical practices carried out through simulation-based education. Additionally, there is a Center of Advanced Medical Simulation and Education at the university where the research was conducted. This center is a multidisciplinary medical simulation facility that provides high-quality education using advanced simulation systems and various educational methodologies. Furthermore, the researchers have certificates indicating that they have completed training on simulation applications in nursing education provided by the university.

Measures

The translation and back translation processes of this rubric followed the recommendations of the International Society for Pharmacoeconomics and Outcomes Research. This process included preparation, forward translation, reconciliation, back translation, back translation review, harmonization, cognitive interview, review and finalization of the results of the cognitive interview, and final reading [24].

Permission was obtained from the author of the rubric, and studies on the subject were investigated. Two independent faculty members and a linguist who was fluent in both languages translated the rubric into Turkish. The translations were compared, and ambiguous expressions and inconsistencies between languages were evaluated by the researchers. Spelling and typographical errors were also checked. A linguist whose native language was English and who lives in Turkey translated the Turkish version back into English, and consistencies were evaluated. The translated measurement tool was sent to the scale author to evaluate it for meaning and similarity. For content validity, the Turkish-translated rubric was submitted to the opinions of 10 faculty members who completed their doctorate degree in different fields of nursing (nursing education, fundamentals of nursing, surgical nursing, medical nursing, pediatric health and diseases nursing, medical education) and provided simulation-based education. The experts were asked to evaluate each item in terms of its suitability for the purpose and comprehensibility, and to provide their opinions on improving the items, following the Davis technique.

The rubric, which was adapted to the target language consistent with the opinions received from the experts, was piloted with eight randomly selected simulation experience videos included in this study. In the pilot application, the faculty members who watched the simulation videos of the student nurses were informed about the rubric and asked to evaluate using this rubric. After the pilot study, necessary adjustments were made to the rubric consistent with the feedback from the instructors. An instructor who had not previously seen the translation of the rubric was provided the rubric to examine it for spelling, punctuation, and reading errors. All data were recorded during the language and cultural adaptation processes of the rubric, which was made ready for use in evaluating student nurses' clinical judgment competency in simulation-based education practices.

Data collection

The Lasater Clinical Judgment Rubric (LCJR) was developed to provide a common language for nurse educators and students to assess clinical judgment competence in simulation-based education and to describe the trajectory of clinical judgment development. The rubric includes 11 dimensions that evaluate students' clinical judgment abilities, with performance scored across four levels of development: beginner (1 point), developing (2 points), proficient (3 points), and exemplary (4 points). The LCJR categorizes clinical judgment into four aspects: noticing, interpreting, responding, and reflecting. Noticing involves focused observation, recognition of deviations from expected patterns, and information seeking. Interpreting includes prioritizing data and making sense of the data. Responding highlights maintaining a calm and confident manner, clear communication, well-planned interventions with flexibility, and being skillful. Reflecting focuses on evaluation/self-analysis and commitment to improvement. Students' overall clinical judgment is determined by their total score across the 11 dimensions, categorized as beginning (11 points), developing (12–22 points), successful (23–33 points), and exemplary (34–44 points) [17, 25, 26].

In this study, fourth-year nursing students, who constituted the sample group, participated in three different scenario applications requiring clinical decision-making during home visits organized as part of the public health nursing course within the curriculum. To ensure comprehensive sampling, all three scenarios, which were of the same level, were included. A total of 64 students participated in the study. The scenario was designed in accordance with the Healthcare Simulation Standards of Best

Practice™ of the International Nursing Association for Clinical Simulation and Learning (INACSL) [27].

The students were provided theoretical training by the instructor of the course for the learning objectives, and relevant resources were shared. Before the scenario implementation, a 15-min prebriefing was conducted [28]. In this preliminary information session, information about the patient's background, learning objectives, and role of the nurse were presented. Before the SBE, the students provided consent that audio and video recordings would be taken and that these data could be used for educational and research purposes. The students participated in the scenario in groups of two, with each scenario lasting approximately 10 min. One student assumed the role of the nurse, while the other took on the role of the student nurse. During the evaluation process using the rubric, the students who played the nurse role were assessed, as the decision-making process was centered on the nurse. During the scenario, audio and video recordings were taken. The student who completed the scenario moved to the debriefing room indicated in the prebriefing.

After completing the scenarios, the debriefing session was conducted in groups of 8–10 students in 30–40-minute sessions, as recommended by the INACSL [29]. A moderator, who received training on simulation-based training in nursing education provided by the institution and was certified, observed the scenario during the implementation and led the debriefing session. The debriefing for the promoting excellence and reflective learning in simulation method was used in the debriefing session [29].

The recordings of the clinical simulation scenarios wherein the students participated were taken from the Learning Management System archive used by the Clinical Simulation Training Center. In the video recordings, the students were assigned codes; subsequently, two researchers independently evaluated the students using the Lasater Clinical Judgment Rubric- Turkish (LCJR-T) version. In case of inconsistency, the third researcher acted as an independent evaluator, and these inconsistencies were resolved by consensus. The researchers evaluating the videos are instructors in the nursing department and are not responsible for grading the students.

Ethical considerations

Permission was obtained from the author of the scale via e-mail to adapt the scale into Turkish and conduct validity and reliability studies. Before data collection began, ethics committee approval (approval no.: 2023-21/737) was obtained from the Medical Research Ethics Committee of the institution where the study was conducted, and written institutional permission was obtained from the university administration.

Data analysis

The data obtained in this study were evaluated in a computer environment using Statistical Package for the Social Sciences (SPSS) version 22.0 and Analysis of Moment Structures (AMOS) statistical programs. To determine whether the research variables were normally distributed, kurtosis and skewness values were analyzed. The kurtosis values of the variables that showed normal distribution were between + 1.5 and − 1.5, and the skewness values were between + 2.0 and − 2.0.

Interobserver agreement was analyzed using kappa analysis and intraclass correlation coefficient (ICC). To assess the construct validity of the scale, confirmatory factor analysis (CFA) was performed. Scale reliability was analyzed using Cronbach's alpha. Item analysis, internal consistency, and scale discrimination were analyzed using independent samples t tests between the lower and upper 27% groups.

Results

The mean age of the student nurses who participated in this study was 21.98 ± 1.17 (min–max: 19–28) years.

Validity analysis

For the validity analysis of the rubric, language, content, and construct validities were analyzed.

Content validity index

This expert opinion step was performed to evaluate the content validity of the Turkish rubric. To calculate the content validity index (CVI) of the rubric, the Davis technique (Davis, 1992) was used. The rubric was sent to 10 experts, comprising academicians. Expert opinions were analyzed, and the CVI was calculated. The CVI value of the rubric was 0.94, and the content validity ratio (CVR) value was 0.97.

Construct validity

In this study, CFA was performed to examine whether the factor structure of the translated rubric was compatible with that of the original scale. CFA results showed that the factor loadings of the rubric items ranged between 0.537 and 0.998, and the factor loadings for all the items were statistically significant ($p < 0.001$) (Table 1; Fig. 1).

In this study, the following were the fit indices of the scale: chi-square/degrees of freedom (χ2/df), 1.70; goodness-of-fit index (GFI), 0.90; comparative fit index (CFI), 0.94; root mean square error of approximation (RMSEA), 0.06; and root mean square residual (RMR), 0.03 (Table 2).

Table 1 Factor loadings of the LCJR-T

Item and Factors			β	Std. β	C. Error	t	*p*
R3	<---	F1	1,000	0.819			
R2	<---	F1	0.782	0.718	0.130	6.014	$p < 0.001$
R1	<---	F1	0.965	0.877	0.130	7.426	$p < 0.001$
R5	<---	F2	1.000	0.681			
R4	<---	F2	0.706	0.537	0.160	4.414	$p < 0.001$
R9	<---	F3	1.000	0.627			
R8	<---	F3	1.024	0.537	0.270	3.788	$p < 0.001$
R7	<---	F3	1.268	0.763	0.252	5.026	$p < 0.001$
R6	<---	F3	1.615	0.702	0.342	4.717	$p < 0.001$
R11	<---	F4	1.000	0.935			
R10	<---	F4	1.139	0.998	0.070	16.358	$p < 0.001$

F1 noticing, F2 interpretation, F3 responding, F4 reflection, R, item, β beta coefficient, Std. B standardized beta coefficient, LCJR-T Turkish language version of the Lasater Clinical Judgment Rubric

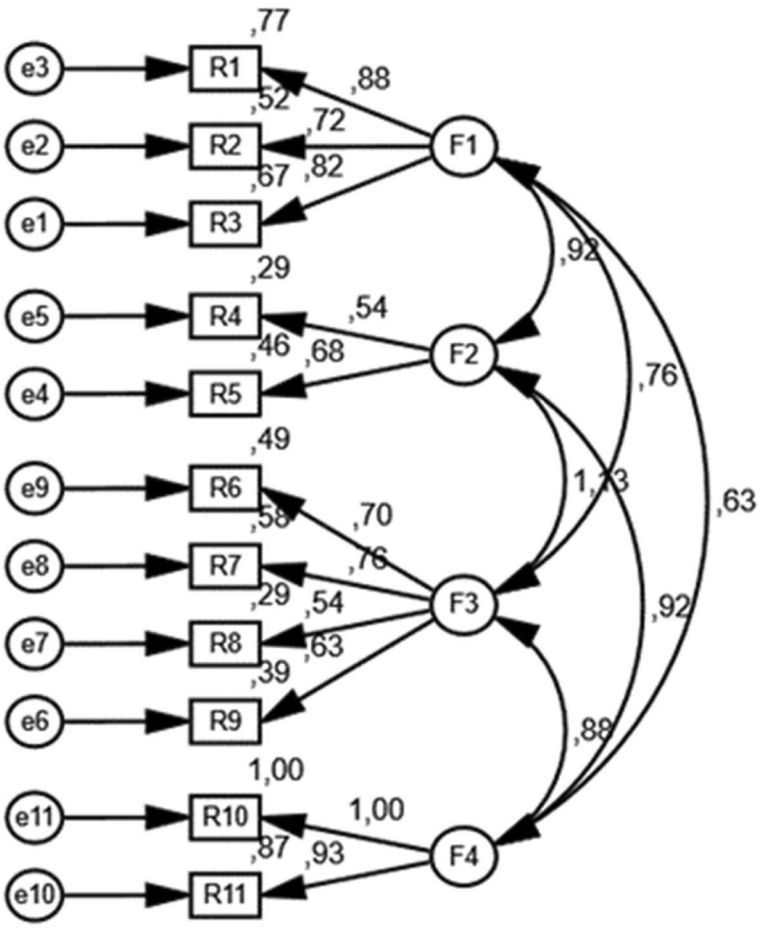

Fig. 1 Confirmatory factor analysis graph of the LCJR-T

Table 2 Model goodness-of-fit indices of the Turkish version of the scale

Indices	χ^2/df	GFI	CFI	RMSEA	RMR
Four-factor model	1.70	0.90	0.950	0.06	0.03

x2 chi-square, df degrees of freedom, GFI goodness-of-fit index, CFI comparative fit index, RMSEA root mean square error of approximation, SRMR root mean square residual

Known-group validity

The rubric content significantly differed between the lower and upper 27% groups ($p < 0.05$). The means of each item were compared between the highest and the lowest 27% score groups using an independent groups t test. The students in the upper 27% group had a significantly greater total score than those in the lower 27% group ($p < 0.01$).

Reliability analysis

Internal consistency (Cronbach's alpha and item–total score correlation) and interobserver agreement reliability methods were used in the reliability analysis of the measurement tool.

Internal reliability

The overall Cronbach's alpha value of the rubric was 0.96, the Spearman–Brown coefficient was 0.921 (equal length), and the Guttman split-half coefficient was 0.912. The Cronbach's alpha values of the noticing, interpretation, responding, and reflection subdimensions of the rubric were 0.84, 0.82, 0.83, and 0.80, respectively (Table 3). Analyzing the item–total correlations revealed that the correlation values ranged between 0.64 and 0.90 (Table 4).

Interobserver agreement

To evaluate the agreement between the two observers, kappa and ICC analyses were performed. The kappa values ranged between 0.72 and 0.92, indicating significant agreement for all the items ($p < 0.05$). The ICC values ranged between 0.70 and 0.90 and were statistically significant for all the items ($p < 0.05$). The highest ICC value was 0.90 for item 8 (Table 4.).

Discussion

This study aimed to assess the validity and reliability of the Turkish version of the Lasater Clinical Judgment Rubric. The rubric evaluates the stages of clinical judgment competency in student nurses, specifically within the context of simulation-based education. The findings contribute to understanding the applicability of the rubric in the Turkish nursing education setting and

Table 3 Internal consistency levels of the LCJR-T

	Item	Min–Max	Mean ± SD	Cronbach's alpha
Noticing	1, 2, 3	6–12	9.06 ± 1.55	0.845
Interpretation	4, 5	4–8	5.59 ± 0.92	0.823
Responding	6, 7, 8, 9	7–15	11.20 ± 1.73	0.836
Reflection	10, 11	2–8	5.76 ± 1.15	0.809
Total	1–11	21–41	87.11 ± 12.32	0.912

Min Minimum, Max Maximum, SD standard deviation, LCJR-T Turkish language version of the Lasater Clinical Judgment Rubric

Table 4 Reliability analysis results of the LCJR-T

Item number	Mean when excluded from the rubric	Variance when excluded from the scale	Corrected item–total correlation	Cronbach's alpha when the item was removed	ICC-a	ICC-b
1	30.1094	40.194	0.657	0.961	0.82	0.003
2	30.1563	38.420	0.840	0.955	0.75	0.005
3	30.1875	38.187	0.824	0.956	0.72	0.008
4	30.1875	38.123	0.857	0.955	0.85	0.001
5	30.1250	37.857	0.872	0.954	0.82	0.003
6	29.9531	38.871	0.837	0.955	0.70	0.010
7	30.1094	37.274	0.849	0.955	0.88	0.000
8	30.1250	37.571	0.854	0.955	0.90	0.000
9	30.0938	37.801	0.900	0.953	0.80	0.003
10	29.5469	40.125	0.791	0.957	0.84	0.002
11	29.4063	41.515	0.640	0.961	0.78	0.004

LCJR-T, Turkish language version of the Lasater Clinical Judgment Rubric ICC-a: intraclass correlation coefficient first observer, ICC-b: intraclass correlation coefficient second observer

its role in enhancing the evaluation of clinical judgment skills.

Validity analysis

Content validity is an indicator of the extent to which each item of the scale and the whole scale serve a purpose [30]. This study used the Davis technique for content validity. Regarding the appropriateness of the questions, the opinions of 10 experts with at least a PhD degree and experience in simulation-based training were obtained, and CVI and CVR values were calculated using the data obtained. The lowest CVI and CVR value was 0.80 [31]. In this study, no items with CVI and CVR values of < 0.80 were noted, and the average CVI and CVR values of the total scale items were 0.97 and 0.94, respectively. This value is consistent with that reported in the literature, and the fact that both values are > 0.80 in this rubric indicates that content validity is considered sufficient [32]. This finding indicates that the rubric items represent the population targeted by this study.

Here, CFA was used to examine the construct validity of the rubric. CFA is performed to confirm the factors identified in measurement tools adapted from a foreign language [33] . χ2/df, GFI, IFI, CFI, RMSEA, RMR, and SRMR are the indices used for evaluating the goodness-of-fit of factors in CFA [34, 35]. The acceptable goodness-of-fit level for the GFI, IFI, and CFI is ≥ 0.90, and a value of ≥ 0.95 is considered good. The acceptable goodness-of-fit level for χ2/df is between 3 and 4, and values between 0 and 3 are considered good fits. The acceptable agreement level for the RMSEA is between 0.05 and 0.08, and a range of 0–0.05 indicates good agreement. The acceptable agreement level for the SRMR and RMR ranges from 0.05 to 0.10, and 0–0.08 is considered a good agreement level [35]. In this study, CFA was used to evaluate the four-factor structure. In the validity and reliability study conducted by Shin et al. for the Korean version, the four-factor model provided a better fit than the second-order factor and independence models [22]. In this study, the following were the fit indices of the rubric: χ2/df, 1.70; GFI, 0.90; AGFI, 0.90; CFI, 0.94; RMSEA, 0.06; and RMR, 0.03. The validity and reliability of the rubric slightly differ between the findings obtained in this study and the fit indices in the Spanish, Portuguese and Korean adaptation studies [18, 21, 22]. These differences were believed to be due to the different languages and cultural characteristics wherein the scales were developed and adapted; however, despite the differences in Korean, Portuguese and Spanish, they demonstrated similarity in terms of showing an acceptable level of agreement. The obtained data revealed that the four-factor structure of noticing, interpreting, responding, and reflecting showed an acceptable and good fit.

The CFA results revealed that noticing, interpreting, responding, and reflecting factor loadings were 0.72–0.88, 0.54–0.68, 0.54–0.76, and 0.93–1.00, respectively. The critical values and significance levels of the items indicate that all the scale items are necessary. In the literature, scale items with factor loadings of < 0.30 should be removed from the scale [36]. In this study, the fact that the factor loadings of the items were > 0.30 and within acceptable limits shows that the rubric has a valid structure for the sample in Turkish and that each item can accurately measure the feature in the dimension to which it belongs.

Reliability analysis

Reliability is the ability of a measurement instrument to consistently measure a desired characteristic [37]. In this study, the reliability of the rubric adapted into Turkish was evaluated using internal consistency and invariance analyses. Internal consistency indicates that all the items and subdimensions of a scale measure the same concept. Cronbach's alpha reliability coefficient and item–total score reliability are the most frequently used methods for determining the internal consistency of a measurement tool [38]. The Cronbach's alpha value of a measurement tool is interpreted as "not reliable," "low reliability," "reliable," and "highly reliable" when it has a range of 0–0.40, 0.40–0.60, 0.60–0.80, and 0.80–1.00, respectively [27, 32]. In this study, the Cronbach's alpha coefficient of the LCJR-T was 0.912, and each item had a high Cronbach's alpha coefficient. In the validity and reliability studies of the original version of the rubric, the Cronbach's alpha coefficient ranged 0.86–0.97 [22, 39, 40]. The rubric was noted to have a high reliability level.

Analyzing the item–total correlations revealed that each item had a strong relationship with the scale. Although there is no consensus on the range of the correlation coefficient, it should be between 0.30 and 0.50 at a minimum [41]. The correlation values ranging between 0.64 and 0.90 indicate that all the items are in good agreement with the general structure of the scale.

In this study, interrater reliability was used for evaluating invariance. The kappa values ranged 0.72–0.92, and a significant agreement for all the items was observed ($p < 0.05$). The kappa values are high for the items, indicating that the agreement between the observers is relatively consistent. Similarly, the ICC values indicate that the agreement between the observers is good. The ICC values ranged 0.70–0.90 and were statistically significant for all the items ($p < 0.05$). Kappa and ICC analyses revealed that the observers' assessments were consistent and statistically significant.

Conclusion

On the basis of the scholarly approach to translation and these results, the LCJR-T is a valid and reliable tool for assessing student nurses' clinical judgment competency stages of—noticing, interpreting, responding, reflecting, and is particularly applicable for use with Turkish nursing students. The rubric can be used as an effective assessment tool for evaluating and improving students' clinical judgment stages in different simulation practice in the nursing education process.

The adapted Lasater Clinical Judgment Rubric (LCJR) can be effectively utilized in simulation experiences to evaluate clinical judgment skills, providing significant contributions to curriculum development. The rubric plays a crucial role in determining students' level of development and offers educators a structured framework to plan targeted interventions aimed at enhancing clinical judgment skills and supporting students in achieving the required competencies before graduation. However, the recruitment of participants from a single university limits the generalizability of the findings. Including a more diverse participant group in future studies could strengthen the applicability and reliability of the results.

Abbreviations

CFA	Confirmatory factor analysis
CFI	Comparative fit index
CVI	Content validity index
CVR	Content validity ratio
GFI	Goodness-of-fit index
ICC	Intraclass correlation coefficient
LCJR	Lasater Clinical Judgment Rubric
PRO	Patient-Reported Outcomes
RMR	Root mean square residual
RMSEA	Root mean square error of approximation
SPSS	Statistical Package for the Social Sciences
SBE	Simulation Based Education
AMOS	Analysis of Moment Structures
INACSL	International Nursing Association for Clinical Simulation and Learning

Supplementary Information

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Additional file 1.

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Clinical trial number

Not applicable.

Authors' contributions

ES, HYÇ, ÜK : Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing–original draft, Writing–review & editing. ES, HYÇ, ÜK, KL: Writing–original draft, Writing–review & editing. All authors approved the final manuscript for submission.

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Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

The study was approved by the Medical Research Ethics Committee of Acıbadem University and Acıbadem Healthcare Institutions (approval no.: 2023-21/737). Permission was obtained from the universities. Informed consent was obtained from those who agreed to participate in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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