JERN Journal of Education and Research in Nursing

Original Article

DOI: 10.14744/jern.2025.60430
J Educ Res Nurs. 2026;23(1):54-60

Psychometric Evaluation of the Turkish Version of the Student Perception of Effective Teaching in Clinical Simulation Scale

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Abstract

Background: Clinical simulation is essential in nursing education for enhancing students' clinical reasoning and decision-making, and reliable, culturally adapted tools are needed to assess their perceptions.

Aim: This study examined the validity and reliability of the Turkish version of the Student Perception of Effective Teaching in Clinical Simulation Scale (SPETCS), which evaluates nursing students' views on effective teaching in clinical simulations.

Methods: A cross-sectional study was conducted in a single institution with 173 nursing students. Analyses included content and construct validity, reliability, and stability. Construct validity was examined using Confirmatory Factor Analysis (CFA), and model fit was evaluated using conventional thresholds ($\chi^2/df<3$, Root Mean Square Error of Approximation [RMSEA]≤0.08, Comparative Fit Index [CFI]≥0.90, Standardized Root Mean Square Residual [SRMR]≤0.08).

Results: The scale achieved a Content Validity Index (CVI) of 1.00. Confirmatory Factor Analysis confirmed the original two-factor structure of the Importance subscale (33 items), with factor loadings ranging from 0.462 to 0.800, while the Extent of Agreement subscale retained its unidimensional structure, consistent with the original scale. Model fit indices included $\chi^2/df=2.736$, RMSEA=0.10, CFI=0.770, and SRMR=0.061, indicating a moderate model fit. Although RMSEA and CFI suggested a marginally acceptable fit, SRMR and χ^2/df values were within acceptable limits. Internal consistency was high, with Cronbach's alpha coefficients of 0.957 for the Extent of Agreement subscale and 0.960 for the Importance subscale.

Conclusion: The Turkish adaptation of the SPETCS has proven to be a psychometrically sound tool for evaluating nursing students' views on effective instructional practices in simulation-based education.

Keywords: Nursing, reproducibility of results, simulation training, teaching, validation studies as topic

Introduction

With technological developments in today's healthcare environment, healthcare team members must make rapid and accurate decisions and deliver safe care in high-risk settings. In nursing education, where nurses play an active role within the team, it is essential to prepare graduates who can effectively translate the science and technology of the future into safe and versatile healthcare practice.[1–4]

Clinical simulation offers an experiential learning platform that bridges theory and practice.[5–7] It provides students with a safe environment in which to develop clinical competencies and make decisions without compromising patient safety.[3,8,9] In clinical simulation, effective teaching involves the implementation of instructional approaches tailored to students' observed behaviors and learning responses. This approach contributes to richer learning experiences and increases students' achievement of learning outcomes.[10,11] However, individuals demonstrate distinct characteristics in how they acquire and process information, as well as in the learning strategies they prefer.[12]

Simulation-based education emphasizes learner-centered strategies that enhance engagement and support the achievement of intended learning outcomes.[10,11] Designing and evaluating simulation-based learning (SBL) experiences requires adherence to evidence-informed principles. Several tools have been developed to assess teaching effectiveness in these environments;[13,14] however, although some Turkish instruments assess general teaching effectiveness in nursing education, no tool specifically evaluates students' perceptions of effective teaching in SBL. In particular, there is a lack of instruments that capture both the frequency of observed teaching behaviors (Extent of Agreement) and their perceived importance (Importance subscale). Therefore, this methodological study was conducted to evaluate the validity and reliability of the Turkish version of the Students' Perception of Effective Teaching in Clinical Simulation Scale (SPETCS).

Research Question

Is the Turkish version of the Students' Perception of Effective Teaching in Clinical Simulation Scale (SPETCS) a valid and reliable instrument for use with nursing students?

This study was presented as an oral presentation at the 6th National 2nd International Basic Nursing Care Congress.

Cite this article as: Coşkun M, Kan Öntürk Z, Karabacak Ü, Ateş E. Psychometric Evaluation of the Turkish Version of the Student Perception of Effective Teaching in Clinical Simulation Scale. J Educ Res Nurs. 2026;23(1):54-60.

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Received: August 04, 2025
Accepted: December 29, 2025
Publication Date: March 01, 2026

Materials and Methods

This cross-sectional methodological study examined the psychometric properties of the Turkish adaptation of the SPETCS, aiming to establish its validity and reliability for assessing nursing students' perceptions of teaching effectiveness in SBL.

Participants and Setting

The study sample consisted of undergraduate nursing students from a foundation university in Istanbul, where institutional approval was obtained. Inclusion criteria included enrollment in the nursing program, full participation in simulation activities designed in accordance with Jeffries' framework and the International Nursing Association for Clinical Simulation and Learning (INACSL)[1] standards, and voluntary consent to participate. Based on standard recommendations, a sample size of 5 to 20 participants per scale item was used to estimate the required sample size[15,16] As the scale consists of 33 items, the final sample comprised 173 students.

Instruments

Data were collected using a sociodemographic form and the SPETCS. The sociodemographic form included six items addressing age, gender, year of study, prior exposure to simulation, number of simulation sessions attended, and academic level.

SPETCS

The SPETCS was developed by Pamela R. Jeffries[1] and Cynthia E. Reese in 2009 to assess teaching effectiveness in simulation-based nursing education.[17] The instrument consists of two subscales, 'Extent of Agreement' and 'Importance,' each comprising 33 items rated on a 5-point Likert scale. The Extent of Agreement subscale evaluates how frequently students observe specific teaching behaviors, whereas the Importance subscale assesses how important students perceive these behaviors to be for their learning.

In the original version of the SPETCS, factor analysis indicated that the Extent of Agreement subscale is unidimensional, while the Importance subscale comprises two distinct factors: Learner Support and Real-World Application. The Learner Support dimension reflects students' ratings of how often they encountered particular teaching behaviors during simulation activities. The Real-World Application dimension captures students' perceptions of the importance of these behaviors for achieving educational objectives. Higher scores on the Extent of Agreement subscale indicate more frequent use of these strategies, whereas higher scores on the Importance subscale reflect the degree to which students consider these strategies essential for learning outcomes.

The Translation of the SPETCS into Turkish

The initial translation of the SPETCS into Turkish was performed independently by two bilingual translators. To enhance linguistic clarity, four language specialists reviewed the preliminary Turkish version. Subsequently, two different translators who had no prior knowledge of the original scale conducted a back-translation into English. The translated version was then compared with the original to ensure consistency in meaning. Lastly, a Turkish language expert examined the items to ensure they were both grammatically accurate and conceptually appropriate.

Content Validity

For content validity, Davis' method was applied to evaluate the appropriateness and clarity of each item. Ten experts in nursing simulation rated each statement on a 4-point scale ("not appropriate," "slightly appropriate," "quite appropriate," "highly appropriate"). The expert panel (n=10) consisted of professionals from diverse fields, including nursing education (n=6), measurement and evaluation (n=2), and language and linguistics (n=2), ensuring both content and linguistic accuracy of the Turkish version.

Seven expert evaluations were included in the final analysis. Items rated as "quite appropriate" or "highly appropriate" were considered valid for calculation. The Item-Level Content Validity Index (I-CVI) and the Scale-Level Average (S-CVI/Ave) were both calculated as 1.00, indicating perfect agreement among experts and excellent content validity. This 4-point rating system was selected because it allows evaluation of both linguistic clarity and cultural appropriateness, which are essential criteria in scale adaptation studies.

Data Collection

Data were collected during simulation sessions at a foundation university in Istanbul between October 2021 and January 2022. After confirming content and language validity, the Turkish version was pilot-tested with 15 students from various academic levels to assess clarity and comprehension. Based on student feedback, minor wording adjustments were made to improve clarity and cultural adaptation. For example, the item "The instructor provides me enough autonomy in the simulation to promote my learning" was revised to "In order to support my learning, the instructor provides me with sufficient autonomy in the simulation." Similarly, "An instructor-led debriefing is an important aspect of my simulation experience" was revised to "An analysis administered by the instructor is a crucial aspect of my simulation practice." These modifications enhanced linguistic fluency while maintaining the original meaning of the items. Written informed consent was obtained from students who completed all simulation phases and agreed to participate in the test-retest. Completing the questionnaire required approximately ten minutes. Test-retest is recommended to be conducted within a 15–30-day interval.[18] For test–retest reliability, the scale was re-administered three weeks after the initial data collection. This interval was determined in accordance with the COSMIN (Consensus-based Standards for the selection of health Measurement Instruments) guidelines,[19] which recommend a time frame long enough to prevent recall bias but short enough to avoid real change in the construct being measured. Given the relative stability of students' perceptions of teaching effectiveness, a three-week period was considered appropriate. Although 103 students participated in the retest, complete paired data were obtained from 99 students, which were included in the final analysis.

Statistical Analysis

The study adhered to the COSMIN guidelines for evaluating the methodological quality of patient-reported outcome measures. All statistical analyses were conducted using IBM SPSS Statistics for Windows, version 22.0 (IBM Corp., Armonk, NY, USA) and AMOS version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including means, standard deviations, frequencies, and percentages, were calculated to summarize the data.

To assess construct validity, Exploratory Factor Analysis (EFA) with Varimax rotation was conducted, followed by Confirmatory Factor Analysis (CFA) to verify the factor structure.

Content validity was evaluated by calculating the Content Validity Index (CVI). To assess measurement error, the Intraclass Correlation Coefficient (ICC) was calculated using a two-way mixed-effects model with absolute agreement, in accordance with the COSMIN guidelines. ICC values were interpreted as follows: 0.40–0.59=moderate, 0.60–0.74=good, and ≥0.75=excellent reliability.[19]

Ethical Approval

Permission to use the SPETCS was secured through email communication with the original developers. The research received Acıbadem Mehmet Ali Aydınlar University Medical Research Ethics Committee (Approval Number: 2019-19/12, Date: 05.12.2019), in accordance with the Declaration of Helsinki. Students participated voluntarily and provided written informed consent prior to the commencement of data collection.

Results

Participant Characteristics

The study was conducted with a total of 173 students. Of the participants, 11.6% (n=20) were male and 88.4% (n=153) were female. The mean age of the participants was 20.49±1.19 years. In terms of academic standing, 44.5% of the students (n=77) were in their second year, 42.8% (n=74) in their third year, and 12.7% (n=22) were fourth-year students. Students participated in clinical simulation as part of the Internal Medicine Nursing (44.5%), Gynecology and Obstetrics Nursing (42.8%), and Geriatric Nursing (12.7%) courses. Approximately 93.1% (n=161) reported previous simulation scenario experience, with most having participated in two simulations.

Psychometric Measurements

Evaluation of Content Validity Index

The content validity of the scale was assessed according to Davis' technique. Based on expert evaluations, the CVI was calculated for both individual items and the overall scale, with both values found to be 1.00, indicating excellent agreement among reviewers.

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Table 1. Item analysis and internal consistency

Extent of agreement				Importance				
Item	**r**	**α†**	**α**	**Learner support/item**	**r**	**α†**	**α**	**α**
Item 1	0.569	0.957	0.957	Item 2	0.727	0.958	0.933	0.960
Item 2	0.746	0.956		Item 4	0.643	0.959		
Item 3	0.590	0.957		Item 5	0.453	0.960		
Item 4	0.674	0.957		Item 6	0.722	0.958		
Item 5	0.710	0.956		Item 7	0.614	0.959		
Item 6	0.646	0.957		Item 8	0.522	0.960		
Item 7	0.614	0.957		Item 9	0.552	0.960		
Item 8	0.664	0.957		Item 10	0.737	0.958		
Item 9	0.549	0.957		Item 14	0.601	0.959		
Item 10	0.672	0.957		Item 16	0.654	0.959		
Item 11	0.439	0.958		Item 17	0.630	0.959		
Item 12	0.685	0.957		Item 18	0.701	0.958		
Item 13	0.561	0.957		Item 19	0.571	0.959		
Item 14	0.587	0.957		Item 21	0.649	0.959		
Item 15	0.659	0.957		Item 22	0.694	0.958		
Item 16	0.618	0.957		Item 24	0.664	0.959		
Item 17	0.553	0.958		Item 25	0.654	0.959		
Item 18	0.701	0.956		Item 26	0.716	0.958		
Item 19	0.680	0.956		Item 28	0.576	0.959		
Item 20	0.697	0.956		Item 30	0.725	0.958		
Item 21	0.613	0.957						
				Real-world application/item	**r**	**α†**		
				Item 1	0.530	0.959		0.907
Item 22	0.578	0.957		Item 3	0.520	0.959		
Item 23	0.634	0.957		Item 11	0.591	0.959		
Item 24	0.518	0.958		Item 12	0.797	0.958		
Item 25	0.713	0.956		Item 13	0.665	0.958		
Item 26	0.554	0.957		Item 15	0.602	0.959		
Item 27	0.663	0.957		Item 20	0.733	0.958		
Item 28	0.677	0.957		Item 23	0.714	0.958		
Item 29	0.766	0.956		Item 27	0.718	0.958		
Item 30	0.680	0.956		Item 29	0.728	0.958		
Item 31	0.725	0.956		Item 31	0.760	0.958		
Item 32	0.678	0.957		Item 32	0.689	0.958		
Item 33	0.755	0.956		Item 33	0.694	0.958		

r: Corrected item-total correlation, †Cronbach's alpha if item deleted, α: Cronbach's alpha for subscales and total scale.

Evaluating Items and Internal Consistency

To determine the internal consistency of each subscale, item analysis involved the calculation of Cronbach's alpha values. When individual items were excluded, the reliability coefficients for the Extent of Agreement scale ranged between 0.956 and 0.958, and between 0.958 and 0.960 for the Importance scale. These results demonstrate that the items exhibit a consistently high degree of internal reliability. Internal consistency was high, with alpha scores of 0.933 and 0.907 for Learner Support and Real-World Application, respectively (Table 1).

Evaluating Construct Validity

An EFA was conducted to assess the structural validity of the scale. Varimax rotation revealed a two-factor structure consistent with the original version. The first factor had an eigenvalue of 15.36 and explained 46.55% of the variance, while the second factor had an eigenvalue of 2.15 and explained 6.50% of the variance. Together, these two factors accounted for 53.05% of the total variance. Factor analysis showed that no items had factor loadings below 0.40 or cross-loadings exceeding 0.10 across multiple factors. The adequacy of the sample for factor analysis was assessed using the Kaiser-Meyer-Olkin (KMO) statistic, and Bartlett's Test of Sphericity was used to determine whether the correlation matrix was suitable for exploratory factor analysis. A KMO value approaching 1 indicates strong sampling adequacy.[20] In this study, the KMO measure was 0.893, indicating good sampling adequacy. Bartlett's test yielded a significant result ($p<0.001$), confirming the factorability of the correlation matrix. Once the dataset was confirmed to be suitable for factor analysis, eigenvalues and the scree plot were examined to identify the factor structure and assess the proportion of variance explained by each factor. The results accounted for 53.1% of the variance. Figure 1 illustrates the number of dimensions to which the factors were assigned based on the eigenvalues.

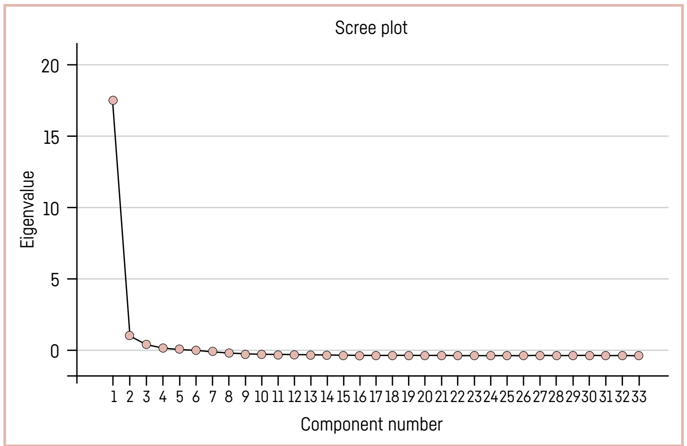

Figure 1. Scree plot of the SPETCS importance scale.

The factor loadings from the SPETCS factor analysis are presented in Table 2, with values ranging from 0.462 to 0.752 for Factor 1 and from 0.497 to 0.800 for Factor 2.

The standardized factor loadings for each item within the Importance scale's two subscales are illustrated in Figure 2, based on the CFA findings.

Confirmatory factor analysis model fit was evaluated using several indices, as outlined in Table 3, including the adjusted chi-square to degrees of freedom ratio (χ^2/df), the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI), and the Standardized Root Mean Square Residual (SRMR). The analysis yielded a χ^2/df value of 2.736 ($p<0.01$), RMSEA=0.100, CFI=0.770, and SRMR=0.061, indicating a borderline acceptable fit. While the RMSEA and CFI values suggest a marginal fit, the SRMR and χ^2/df values fall within acceptable limits, supporting the overall adequacy of the model (Table 3). In addition, test-retest reliability was examined to assess the stability of the scale scores over time. The Intraclass Correlation Coefficient values were 0.54 for the Participation Rating and 0.58 for the Importance Rating, indicating moderate test-retest reliability in accordance with COSMIN standards.[19]

Stability (Test-Retest Reliability)

A test-retest application was conducted with 99 participants, representing the students who completed both the test and retest administrations three weeks apart. The SPETCS Extent of Agreement scores ranged from 63 to 165 points in the test; the test mean score was 150.87±15.55, and the retest mean score was 151.57±16.74. The SPETCS Importance scores ranged from 110 to 165 points in the test; the test mean score was 159.57±9.47, and the retest mean score was 160.67±8.72.

Paired t-test results showed no significant differences between the two assessments for either subscale ($p>0.05$ for both subscales). Cronbach's alpha values for test-retest reliability were 0.957 (Extent of Agreement) and 0.960 (Importance) at baseline, and 0.966 and 0.961 at retest, confirming the scale's temporal stability (Table 4).

Discussion

In recent years, clinical simulation has been widely used in nursing education. To assess the effectiveness of this teaching method, numerous assessment tools have been developed.[9,21,22] However, no Turkish-language tool exists to assess the effectiveness of clinical simulation. Moreover, no prior research has focused on adapting the SPETCS, developed by Jeffries[1] and Reese,[17] into Turkish. Therefore, this effective assessment tool was culturally adapted for use in Türkiye, and its validity and reliability were subsequently evaluated. To use assessment tools in a language other than the original, the adaptation process requires multiple analyses. The procedures necessary to confirm the reliability of data collected through adapted scales have been described similarly in the existing literature.[23] The World Health Organization has outlined specific steps to be followed during the adaptation process, and the findings of this study were discussed in alignment with these guidelines. The confirmatory factor analysis revealed a borderline but acceptable model fit (CFI=0.77; RMSEA=0.10), which is comparable to other adaptation studies of complex educational scales. Despite the moderate fit indices, the theoretical two-factor model remained conceptually consistent. Although the CFI value was slightly below the ideal threshold, this may be attributed to cultural and linguistic nuances affecting students' interpretation of the items or to sample-specific characteristics. Future research may explore potential model modifications or test alternative models to improve model fit while maintaining theoretical coherence. Furthermore, test-retest analysis demonstrated moderate stability, with ICC values of 0.54 for the Participation Rating and 0.58 for the Importance Rating, supporting the temporal reliability of the Turkish version in accordance with COSMIN standards.

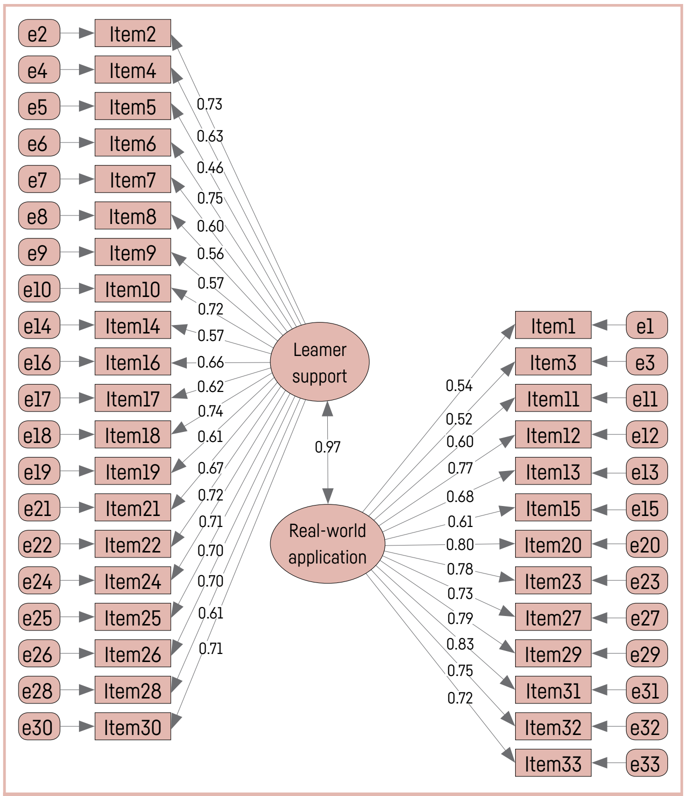

Figure 2. Confirmatory factor analysis model of the SPETCS importance scale.

Content validity refers to the suitability of an assessment tool for its intended purpose, whether the items measure the area under investigation, and whether they assess the targeted domain.[23] In this study, Davis' method was used, in which each item is rated as "appropriate," "needs minor changes," "needs major changes," or "not suitable."[24] The items were revised to conform to Turkish language and spelling rules. CVI values were calculated by determining the proportion of experts who rated the items as either "appropriate" or in need of "minor changes" relative to the total expert panel. Scores equal to or above 0.80 indicate satisfactory content validity.[25] The original SPETCS reported a CVI of 0.91, whereas this study achieved ideal scores of 1.00 for both individual items and the overall scale, indicating strong validity and cultural suitability for Turkish use.

Cronbach's alpha is commonly used to assess internal consistency, with values equal to or exceeding 0.70 generally considered acceptable.[26] The minimum Cronbach's alpha value observed after deleting any item from the scale was 0.95, indicating that removing individual items did not affect overall reliability. Cronbach's alpha coefficients between 0.60 and 0.79 indicate acceptable reliability, whereas values ranging from 0.80 to 1.00 suggest high reliability.[16,26] In the original SPETCS, Jeffries[1] and Reese[17] reported Cronbach's alpha values of 0.95 for the Extent of Agreement scale and 0.96 for the Importance scale. Consistent with these findings, the Turkish adaptation in this study demonstrated comparable reliability, with Cronbach's alpha coefficients of 0.95 and 0.96, respectively, confirming the instrument's strong reliability.

DOI: 10.14744/jern.2025.60430
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Table 2. Factor analysis of the SPETCS importance response scale

Items	Item no	Factor 1	Factor 2
Questions asked by the instructor after the simulation helped guide my thinking about the simulation experience.	2	0.692	
The instructor provided useful feedback after the simulation.	4	0.619	
The instructor facilitated my learning in this simulation.	5	0.462	
Discussing the simulation during debriefing supports my understanding and reasoning.	6	0.749	
An instructor-led debriefing is an important aspect of my simulation experience.	7	0.639	
The instructor was comfortable with the simulation experience.	8	0.547	
The simulation was interesting.	9	0.528	
Appropriate questions were asked during the debriefing of the simulation experience.	10	0.737	
Questioning by the instructor helps me to better understand the clinical situation experienced, even though it is a simulated environment.	14	0.618	
Cues were used in the simulation to help me progress through the experience.	16	0.707	
The instructor served as a role model during the simulation.	17	0.662	
The instructor demonstrated clinical expertise during this simulation experience.	18	0.728	
The instructor was receptive to feedback.	19	0.614	
The instructor encouraged helpful collaboration among participants during debriefing.	21	0.678	
The difficulty of the simulation was appropriate.	22	0.697	
Cues were provided at appropriate times during the simulation.	24	0.696	
Participation in this simulation helped me understand classroom theory.	25	0.712	
The instructor encouraged helpful collaboration among simulation participants during the simulation.	26	0.708	
The instructor used a variety of questions during the debriefing.	28	0.622	
The instructor was enthusiastic during the simulation.	30	0.752	
The instructor allowed me time to think through challenging areas of the simulation.	2		0.497
The instructor provides me with enough autonomy in the simulation to promote my learning.	3		0.526
The simulation was realistic.	11		0.577
The simulation fit with the objectives of this course.	12		0.740
I will be better able to care for a patient with this type of problem in clinical practice because I participated in this simulation.	13		0.665
This simulation helped develop my critical thinking skills.	15		0.608
Participation in this simulation was a valuable learning activity.	20		0.708
Participation in clinical simulations helps me meet clinical expectations when caring for real patients.	23		0.773
Clinical simulations are an effective learning strategy for me to problem-solve and make decisions.	27		0.769
The clinical simulation experience was well organized.	29		0.783
My learning expectations were met in this clinical simulation.	31		0.800
The simulation experience allows me to model a professional role in a realistic manner.	32		0.744
Questions asked after the simulation helped me understand the clinical decision-making necessary for this experience.	33		0.728
Kaiser-Meyer-Olkin	0.893		
Bartlett's Test	4600.26		
p	<0.001		
Eigenvalue		15.362	2.145
Variance %		46.551	6.500
Cumulative variance %		46.551	53.051

Table 3. Goodness-of-fit indices of the Turkish SPETCS (N=173)

Fit indices	Good fit	Acceptable fit	Model results	Fit evaluation
RMSEA	0<RMSEA<0.05	0.05≤ RMSEA≤0.10	0.100	Borderline acceptable/needs improvement
NFI	0.95≤NFI≤1	0.90≤NFI≤0.95	0.770	Below acceptable/poor fit
CFI	0.97≤CFI≤1	0.95≤CFI≤0.97	0.770	Borderline acceptable
IFI	0.97≤IFI≤1	0.95≤IFI≤0.97	0.840	Borderline acceptable
RFI	0.90≤RFI≤1	0.85≤RFI≤0.90	0.708	Borderline acceptable
SRMR	0≤SRMR≤0.05	0.05≤SRMR≤0.10	0.061	Acceptable
χ^2/df	0≤ χ^2/df≤2	2≤ χ^2/df≤3	2.736	Acceptable

RMSEA: Root mean square error of approximation, NFI: Normed fix index, CFI: Comparative fit index, IFI: Incremental fit index, RFI: Relative fit index, SRMR: Standardized root mean square residual, χ^2/df: Chi-square/degrees of freedom.

Table 4. SPETCS test-retest internal consistency values (N=99)

	Mean±SD	Min-max (Median)	Cronbach's Alpha	Paired t-test
Extent of agreement				
Test	150.87±15.55	156 (63–165)	0.957	
Retest	151.57±16.74	158 (83–165)	0.966	0.606
Importance				
Test	159.57±9.47	164 (110–165)	0.960	
Retest	160.67±8.72	165 (113–165)	0.961	0.231

Adequate sampling for factor analysis requires a KMO value above 0.60 and a significant Bartlett's test of sphericity.[27] In this study, EFA with Varimax rotation revealed a two-factor structure for the Importance scale, consistent with the original research, explaining 53.1% of the variance, which falls within the acceptable range of 40–60% in the social sciences. With a KMO value of 0.89 and a significant Bartlett's test result ($p<0.01$), the data were deemed suitable for factor analysis due to sufficient sample size and appropriate item interrelations.

Factor loadings ranged from 0.462 to 0.752 for Factor 1 and from 0.497 to 0.800 for Factor 2, all exceeding the commonly accepted threshold of 0.30 for item retention.[27] Accordingly, none of the original items were excluded from the scale. Regarding model fit, the Normed Fit Index (NFI), Incremental Fit Index (IFI), and Relative Fit Index (RFI) values were below acceptable levels, whereas RMSEA (0.100), CFI, SRMR, and χ^2/df demonstrated acceptable or good fit.15 These results suggest that the model is statistically valid and adequately fits the data.

The reliability of the Turkish SPETCS was assessed through test-retest analysis involving 99 students, yielding consistent Cronbach's alpha coefficients over time. This approach aligns with recommendations in the literature, which suggest evaluating stability using approximately 25% of the total sample.[18]

In summary, the Turkish SPETCS demonstrates strong construct validity, internal consistency, temporal stability, and adequate psychometric properties for use with nursing students. The validated Turkish version of the SPETCS can serve as a valuable tool for nursing educators and curriculum developers. By systematically evaluating the effectiveness of simulation-based education, it may guide improvements in instructional design, student engagement strategies, and feedback mechanisms in clinical education. In this way, the tool contributes to the standardization and quality assurance of simulation practices in Turkish nursing curricula. Further studies involving larger and more diverse samples across different nursing schools are recommended to confirm the scale's generalizability. Moreover, examining the relationship between SPETCS scores and learning outcomes, such as clinical performance or critical thinking, could provide additional evidence of its practical utility in simulation-based education.

Limitations

As participants were recruited from a single university, the findings may not be representative of nursing students in other academic settings across the country. In addition, the sample was relatively homogeneous, consisting predominantly of female students, which may limit the generalizability of the results to more gender-diverse nursing populations. Additionally, the scale's design requires participants to evaluate both the extent of agreement and the importance of items simultaneously, which may increase cognitive load during completion. Another limitation is that psychometric testing was conducted within a single simulation context, focusing on one type of clinical simulation scenario. Therefore, the validity and reliability of the scale across different simulation modalities remain to be examined. Furthermore, some model fit indices (such as RMSEA and RFI) were close to the recommended cutoff thresholds. These borderline values should be interpreted with caution and considered a limitation of the study, as they may reflect sample size characteristics or the multidimensional structure of the instrument.

Conclusion

This study, demonstrates that the Turkish version of the SPETCS is a valid and reliable instrument. It serves as an effective tool for evaluating teaching methods and behaviors within SBL settings. The scale supports the evaluation and enhancement of simulation design while contributing to the development of a more effective learning experience. It is recommended that this scale be used to evaluate simulation applications that contribute to program outcomes and are integrated into the curriculum. It can also be used to assess simulation experiences of different types and designs within the curriculum. In addition, the SPETCS can be applied across various SBL environments to evaluate teaching effectiveness. It is suitable for use in formative assessments conducted during simulation-based training as well as in summative evaluations at the end of courses or clinical rotations. Regular use of the scale can help educators monitor improvements in teaching quality and learning outcomes over time. Future studies are recommended to examine the psychometric properties of the Turkish SPETCS in different nursing populations and educational contexts to ensure broader generalizability. Further research could also explore criterion validity by correlating SPETCS scores with objective performance measures or student learning outcomes. Longitudinal studies may provide additional insight into how simulation-based teaching effectiveness evolves over time.

Ethics Committee Approval: The study was approved by the Acıbadem Mehmet Ali Aydınlar University Medical Research Ethics Committee (Approval Number: 2019-19/12, Date: 05.12.2019).

Informed Consent: Written informed consent was obtained from students.

Conflict of Interest: The authors declare that there are no conflicts of interest associated with this research or its publication.

Funding: This research was conducted without any dedicated funding from public, commercial, or charitable agencies.

Author Contributions: Concept – M.C., Z.K.Ö., Ü.K.; Design – M.C., Z.K.Ö.; Supervision – Z.K.Ö., Ü.K.; Resource – M.C.; Materials – M.C., Z.K.Ö.; Data Collection and/or Processing - M.C., E.A.; Analysis and/or Interpretation - M.C., Z.K.Ö.; Literature Review – M.C., E.A.; Writing – M.C., Z.K.Ö., Ü.K.; Critical Review – M.C., Z.K.Ö., Ü.K., E.A.

Acknowledgments: We gratefully acknowledge the nursing students who voluntarily contributed to this research through their participation.

Peer-review: Externally peer-reviewed.

References

1. Jeffries PR. Simulation in nursing education: From Conceptualization to Evaluation. Philadelphia: Lippincott Williams & Wilkins; 2020.
2. Almeida RGDS, Jorge BM, Souza-Junior VD, et al. Trends in Research on Simulation in the Teaching of Nursing: An Integrative Review. Nurs Educ Perspect. 2018;39(3):E7–E10. [CrossRef]
3. Hegland PA, Aarlie H, Strømme H, Jamtvedt G. Simulation-based training for nurses: Systematic review and meta-analysis. Nurse Educ Today. 2017;54:6–20. [CrossRef]
4. Poindexter K. The Future of Nursing Education: Reimagined. Nurs Educ Perspect. 2021;42(6):335–336. [CrossRef]
5. Aldhafeeri F, Alosaimi D. Perception of satisfaction and self-confidence with high fidelity simulation among nursing students in government universities. Perception. 2020;11(11):137–149.
6. Labrague LJ, McEnroe-Petitte DM, Bowling AM, Nwafor CE, Tsaras K. High-fidelity simulation and nursing students' anxiety and self-confidence: A systematic review. Nurs Forum. 2019;54(3):358–368. [CrossRef]
7. Zapko KA, Ferranto MLG, Blasiman R, Shelestak D. Evaluating best educational practices, student satisfaction, and self-confidence in simulation: A descriptive study. Nurse Educ Today. 2018;60:28–34. [CrossRef]
8. Monsivais DB, Nunez F. Simulation to Develop Teaching Competencies in Health Professions Educators: A Scoping Review. Nurs Educ Perspect. 2022;43(2):80–84. [CrossRef]
9. Kang SJ, Min HY. Psychological safety in nursing simulation. Nurse Educ. 2019;44(2):E6–E9. [CrossRef]
10. Miller C, Deckers C, Jones M, Wells-Beede E, McGee E. Healthcare Simulation Standards of Best Practicetm outcomes and objectives. Clin Simul Nurs. 2021;58:40–44. [CrossRef]
11. Mulyadi M, Tonapa SI, Rompas SSJ, Wang RH, Lee BO. Effects of simulation technology-based learning on nursing students' learning outcomes: a systematic review and meta-analysis of experimental studies. Nurse Educ Today. 2021;107:105127. [CrossRef]
12. Lavoie P, Michaud C, Belisle M, et al. Learning theories and tools for the assessment of core nursing competencies in simulation: A theoretical review. J Adv Nurs. 2018;74(2):239–250. [CrossRef]
13. McMahon E, Jimenez FA, Lawrence K, Victor J. Healthcare Simulation Standards of Best PracticeTM evaluation of learning and performance. Clin Simul Nurs. 2021;58:54–56. [CrossRef]
14. Watts PI, McDermott DS, Alinier G, et al. Healthcare simulation Standards of Best PracticeTM simulation design. Clin Simul Nurs. 2021;58:14–21. [CrossRef]
15. Tabachnick BG, Fidell LS. Using multivariate statistics. 6th ed. Boston: Allyn and Bacon; 2013.
16. Tavşancıl E. Measuring Attitudes and Data Analysis with SPSS. 5th ed. Ankara: Nobel Akademi Press; 2014.

DOI: 10.14744/jern.2025.60430
J Educ Res Nurs. 2026;23(1):54-60

17. Reese CE. Effective teaching in clinical simulation: Development of the student perception of effective teaching in clinical simulation scale. Dissertation. Indiana University; 2009.
18. Seçer I. Psychological Test Development and Adaptation Process; SPSS and LISREL Applications. Ankara: Ani Publishing; 2015.
19. Cicchetti DV. Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. Psychol Assess. 1994;6(4):284–290. [CrossRef]
20. Akgül A, Çevik O. İstatistiksel analiz teknikleri SPSS'te işletme yönetimi uygulamaları. Ankara: Emek Ofset; 2003.
21. Eva KW, Bordage G, Campbell C, et al. Towards a program of assessment for health professionals: from training into practice. Adv Health Sci Educ Theory Pract. 2016;21(4):897–913. [CrossRef]
22. Oermann MH. Using Simulation for Summative Evaluation in Nursing. Nurse Educ. 2016;41(3):133. [CrossRef]
23. World Health Organization. Process of translation and adaptation of instruments. Accessed January 6, 2026. https://www.scribd.com/document/533869240/WHO-Guidelines-on-Translation-and-Adaptation-of-Instruments
24. Davis LL. Instrument review: Getting the most from a panel of experts. Appl Nurs Res. 1992;5(4):194–197. [CrossRef]
25. Esin MN. Veri Toplama Araçlarının Güvenirlik ve Geçerliği. In: Erdoğan S, Nahcivan N, Esin MN, eds. Hemşirelikte Araştırma Süreç, Uygulama ve Kritik. Nobel Tıp Kitabevleri; 2014:216–229.
26. Taber KS. The use of Cronbach's alpha when developing and reporting research instruments in science education. Res Sci Educ. 2018;48(6):1273–1296. [CrossRef]
27. Ozen N, Aydin Sayilan A, Bal Ozkaptan B, Neves Sousa C, Unver V. The reliability and validity of the Turkish version of the postdialysis fatigue scale. Int J Clin Pract. 2021;75(11): e14871. [CrossRef]