Original Article

Validation and reliability of the Turkish version of the student satisfaction and self-confidence in learning scale for clinical pharmacy education

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ABSTRACT

Background and Aims: Innovations in clinical pharmacy education that are supported by simulations can improve student knowledge and skills. The aim of this study is to assess the validity and reliability of the Turkish version of the Student Satisfaction and Self-Confidence in Learning Scale (SCLS) among pharmacy students in Türkiye.

Methods: This study was conducted at clinical pharmacy departments of Ankara University and Altinbas University between March 28-April 28, 2022. Students taking an online simulation-based learning class during their clinical pharmacy education were eligible. The study adapts the SCLS as developed by the National League for Nursing (NLN, 2004) for pharmacy students, then translates it into Turkish and evaluates the inter-rater and test-retest reliabilities.
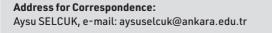
Results: A total of 176 students participated in the study, the majority of whom are female (76.1%); the participants have a mean ± standard deviation (SD) age of 23.42±2.82 years. The coefficients for the inter-rater and test-retest reliabilities were found to be high for the scale (r=0.953, p<0.05; r=1, p<0.05, respectively), with Cronbach's alpha being calculated as 0.95.

Conclusion: The Turkish version of the SCLS is concluded to be a valid and reliable tool for pharmacy students receiving clinical pharmacy education.

Keywords: Clinical pharmacy, Simulation-based learning, Validation, Reliability

INTRODUCTION

Clinical pharmacy education advances students' pharmacotherapy, pharmaceutical care, and patient-centered knowledge and skills through the use of innovative educational approaches (Seybert et al., 2019). Innovations in clinical pharmacy education that are supported by simulations, games, and virtual reality are able to improve students' skills regarding patient-centered care, medical history checks, and counseling practice with standardized patients, as well as interprofessional activities using simulated mannequins by imitating the real world (Seybert et al., 2019; Lynch, Griffin, & Vest, 2018). Such innovations meet the growing demand for impact and creativity academicians in the field of clinical pharmacy seek (Seybert et al., 2019).

The Accreditation Council for Pharmacy Education (ACPE, 2007) describes pharmaceutical simulations as activities or events that repeat practices from the pharmaceutical environment. It is also suggested that pharmacy educators use innovative educational

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technologies and techniques, including a variety of teaching and evaluation methods (ACPE, 2007). These technologies and techniques complement the use of simulations for assisting students in developing critical thinking and problem-solving skills. Simulation-based learning (SBL) allows students to practice their knowledge and skills in a safe and controlled environment (Steadman et al., 2006) and is beneficial in its standardization and repetition of content, interactive learning in a clinical setting without risk to patients, and its ability to design goal-oriented clinical experiences. SBL employs a wide range of simulation environments, ranging from standard to high-quality patient simulations, such as human patient simulators (high, medium, or low-quality patient simulators/dummies), partial task trainers, standardized patients, virtual reality simulation, screen-based computer simulators, and integrated simulators (Steadman et al., 2006; Korayem & Alboghdadly, 2020). Simulation training in advanced clinical pharmacy education has been shown to improve students' confidence, basic knowledge, and communication skills, to encourage critical thinking, and to strengthen patient care (Seybert et al., 2019).

SBL is used in various health disciplines such as medicine, nursing and pharmacy (Korayem & Alboghdadly, 2020). Although SBL has been applied in military, medical, and nursing programs for many years, the use of fidelity human patient simulations in clinical pharmacy education didn't occur until 2006 (Seybert et al., 2019), and pharmacy faculties and health care institutions have adopted SBL in various clinical education formats for all levels of learners and practitioners. Nowadays, many research articles from all around the world have studied how to incorporate SBL into clinical pharmacy education and SBL outcomes (Ferrone, Kebodeaux, & Fitzgerald, 2017; Gustafsson, Englund, & Gallego, 2017; Mak, Fitzgerald, & Holle, 2021). However, only a limited number of faculties have incorporated SBL in Türkiye, and no validated or reliable survey exists in the pharmacy field in Türkiye for measuring the outcomes of SBL in clinical pharmacy education. Surveys have been developed for use in the nursing and medical fields (National League for Nursing, 2006; Turatsinze, Willson, & Sessions, 2020). Therefore, this study aims to evaluate the validation and reliability of the Turkish version of the Student Satisfaction and Self-Confidence in Learning Scale (SCLS) developed by NLN (2004) among pharmacy students.

MATERIALS AND METHODS

Study population and settings
This study was conducted at the clinical pharmacy departments of Ankara University and Altinbas University between March 28-April 28, 2022. Students who were enrolled in an online simulation-based class for learning clinical pharmacy were invited to participate in the study. The SBL activity was carried out using the Monash University-developed program MyDispense®, which was adapted to simulate the dispensing method in Türkiye by the Clinical Pharmacy Department of Altinbas University. During the online SBL, students were given a prescription for chronic diseases such as diabetes mellitus, hypertension, and asthma. The students were responsible for dispensing medications while asking appropriate questions

and providing patient counseling. Although the same program was used, the two universities used different instructors and different medicines in the prescriptions.

To assess the students' satisfaction and self-confidence with SBL for clinical pharmacy education, a search was made in the literature for an appropriate scale, and the authors decided to use the SCLS (NLN, 2004). SCLS is used to measure students' satisfaction and self-confidence levels regarding their clinical skills and care as well as in relation to the instructions, materials, and instructor (NLN, 2006). The scale contains 13 questions that are scored using a 5-point Likert-type scale (0 = totally disagree to 4 = totally agree). The SCLS is a validated survey for SBL and has a Cronbach alpha of 0.94.

The sample size of the study population was determined based on the recommendations for reporting the results of studies on instrument and scale development and testing (Streiner & Kottner, 2014; Streiner, Norman, & Cairney, 2015). The minimum sample size for the study was calculated as 130 participants. This study was approved by the Ethical Committee of Ankara University (Approval no: 05-57, date: 07.02.2022). The informed consent was obtained from the students before collecting survey responses.

Translation process
Before translating the SCLS, permission was obtained from NLN, after which the survey was then translated from English to Turkish by a fluent English-speaking investigator (AS). Then for the back translation, another fluent English-speaking investigator (NA) translated the SCLS back from Turkish into English. Both translations were reviewed by another independent investigator (AB), and the Turkish version of the SCLS was developed. After this, the investigators analyzed the most recent Turkish translation of the SCLS for cultural and conceptual content and equivalence in addition to grammar for particular use in clinical pharmacy education.

Validation process
The students were asked to complete the survey twice (test-retest with a 15-day time interval). The survey was implemented online using Google Forms, and the students were required to answer all the questions in order to complete the survey. The students who only completed the survey once had their responses excluded.

The questioner then evaluated the SCLS for its internal reliability and validation by measuring Cronbach's alpha of reliability and intraclass correlation as presented in the statistical analysis.

Statistical analysis
The data entry and analyses required the use of the package program SPSS (version 26). Descriptive statistics were presented as mean ± SD, while categorical variables were presented as percentages. The Kolmogorov-Smirnov test was used to evaluate the normal distribution of the data. Test-retest reliability (the baseline and post-15-days retest) and inter-rater reliability were evaluated using the intraclass correlation coefficient. The internal reliability estimates were calculated using Cronbach's alpha of reliability.

RESULTS

A total of 176 pharmacy students participated in the study with a mean ± standard deviation (SD) age of 23.42 ± 2.82 and 54.5% being from Ankara University. The mean age was found to be 23.42 ± 2.82 years. The distribution of students in terms of year of study showed 35.2% to be 3rd-year students, 60.3% to be 4th-year, and 4.5% to be 5th-year. The majority of the student participants are female (76.1%; Table 1).

According to the students' pretest responses to the SCLS, Table 2 shows most of the students agreed or strongly agreed with the following survey items: Item 3 (Whether the student enjoyed on how the instructor taught the simulation; 83.5%),

Item 5 (Whether the instructor used suitable way; 80.2%), Item 9 (Whether the instructors used helpful resources; 84.7%), Item 10 (Whether the students knew their responsibility; 83.0%) and Item 13 (Whether the students' knew the instructor's responsibility; 84.7%).

Table 2 shows most of the students agreed or strongly agreed with the following survey items for the posttest: Item 2 (about the variety of materials and activities provided by simulation method; 80.2%), Item 4 (about student motivation about teaching materials for the simulation ; 81.2%), Item 9 (about helpfulness of the resources provided by the instructor; 81.3%), and Item 13 (about instructor responsibility to tell what students need to learn; 82.3%).

Table 3 displays the item-total correlation, Cronbach's alpha., and intraclass correlation. Values for SCLS' subscales. The item-total correlation analysis revealed all items to have a total correlation value greater than 0.75. Cronbach's alpha for the 13-item scale was calculated as 0.95. The study also found the intraclass correlation and test-retest reliability values to be high for the SCLS ($r = 0.952$, $p < 0.001$; $r = 0.706$, $p < 0.001$, respectively; Table 3).

DISCUSSION

This study has demonstrated high reliability for the Turkish version of the SCLS with a Cronbach's alpha of 0.95, which is higher when compared to the original scale (α = 0.94). The Turkish version of the SCLS can be used to assess students' satisfaction and self-confidence regarding simulation-based learning in clinical pharmacy education. Another study was conducted for adapting the SCLS to Turkish, except it involved simulation education among nursing students (Karacay & Kaya, 2017); their study achieved a Cronbach's alpha of 0.88 and removed Item 13 to improve the alpha to 0.90. Their results resembled those

Table 1. Characteristics of the Students who Participated in the Study (*n* = 176).

Variables	*n* (%)
Gender	
Male	42 (23.9)
Female	134 (76.1)
Age	
Mean ± SD	23.42 ± 2.82
School year	
Third year	62 (35.2)
Fourth year	106 (60.3)
Fifth year	8 (4.5)
University	
Altinbas University	80 (45.5)
Ankara University	96 (54.5)

Table 2. Students' Responses to the Scale Items.

Survey item numbers and their contents*		Agreement	
		Pretest	Posttest
Item 1.	Helpfulness of the teaching via simulation method	79.0%	79.5%
Item 2.	Variety of materials and activities provided by simulation method	79.6%	80.2%
Item 3.	Student enjoyment on how the instructor taught the simulation	83.5%	78.4%
Item 4.	Student motivation about teaching materials for the simulation	77.3%	81.2%
Item 5.	Suitability of the teaching by the instructor	80.2%	79.5%
Item 6.	Student confidence regarding mastering the simulation	71.6%	75.1%
Item 7.	Student confidence regarding simulation covers critical content	73.3%	78.4%
Item 8.	Student confidence regarding developing skills/obtaining knowledge	71.1%	73.9%
Item 9.	Helpfulness of the resources provided by the instructor	84.7%	81.3%
Item 10.	Student responsibility for learning what they need to know	83.0%	77.8%
Item 11.	Student knowledge on how to get help when they don't understand	77.8%	76.7%
Item 12.	Student knowledge on how to use the simulation to learn critical aspects	69.9%	74.4%
Item 13.	Instructor responsibility to tell what students need to learn	84.7%	82.3%

*The survey verbatim can be obtained from NLN via permission. The content of the items were modified to give an idea to the readers.

Table 3. The Inter-Rater and Test–Retest Reliability of the Scale Items.

Survey item numbers and their contents*	Cronbach's alpha**
Item 1. Helpfulness of the teaching via simulation method	0.837
Item 2. Variety of materials and activities provided by simulation method	0.845
Item 3. Student enjoyment on how the instructor taught the simulation	0.801
Item 4. Student motivation about teaching materials for the simulation	0.864
Item 5. Suitability of the teaching by the instructor	0.802
Item 6. Student confidence regarding mastering the simulation	0.947
Item 7. Student confidence regarding simulation covers critical content	0.821
Item 8. Student confidence regarding developing skills/obtaining knowledge	0.846
Item 9. Helpfulness of the resources provided by the instructor	0.786
Item 10. Student responsibility for learning what they need to know	0.792
Item 11. Student knowledge on how to get help when they don't understand	0.858
Item 12. Student knowledge on how to use the simulation to learn critical aspects	0.829
Item 13. Instructor responsibility to tell what students need to learn	0.753
Cronbach's alpha for the overall scale	0.953
Intraclass correlation for the overall scale	0.952
Test-retest reliability	0.706

*The survey verbatim can be obtained from NLN via permission. The content of the items were modified to give an idea to the readers.
**This table shows the intraclass correlation values (Spearman's rho; $p < 0.001$), all of which are statistically significant.

from the current study. Another study measured the Turkish validity and reliability of the SCLS among nursing students and calculated Cronbach's alpha values between 0.77–0.85 (Unver et al., 2017), which are lower than what the current study found.

Various evaluations on testing the validation and reliability of the SCLS have been done in other countries. The Chinese version (Chan, Fong, & Tang, 2015) of both SCLS' satisfaction and self-confidence subscale components among nurses showed high reliabilities, with Cronbach alphas of 0.95 and 0.97, respectively. The Spanish version (Farrés-Tarafa et al., 2021) of the SCLS demonstrated high internal consistency and reliability for the overall scale as well as for each of its components, with a Cronbach's alpha of 0.88 for each of the components. The Arabic version (Grande et al., 2022) of the SCLS showed an alpha value greater than 0.70 among nursing students. Lastly, the Portuguese version (Almeida et al., 2015) of the SCLS revealed a Cronbach's alpha of 0.86 among nurses. In this sense, the Turkish version appears to have one of the highest reliability values. Moreover, this was the first study to evaluate the validity and reliability of the SCLS among pharmacy students.

Overall, the students expressed positive responses to the questions regarding their satisfaction and self-confidence. This resembles another study conducted in Türkiye that evaluated the satisfaction, confidence and motivation, clinical experience, and decision-making among 81 pharmacy students (Aksoy & Ozturk, 2021). In Australia, pharmacy students involved in SBL agreed or strongly agreed that they had been provided a learning opportunity to safely make errors knowing that patients could not be harmed and that the learning was more

realistic than addressing a similar patient case on paper (Mak et al., 2021). In the United States of America, students had favorable perceptions about the SBL activity, and their knowledge was significantly improved (Rude et al., 2022).

Pharmacy education must be developed, revised, or updated in order to meet the standards for providing patient-centered care in an interdisciplinary environment and to have effective communication with other health care professionals and patients (Kayyali et al., 2019). Although workplace learning is the gold standard for training pharmacy students to fulfill the standards, obtain funding, and find workplaces is a daunting task for faculties. Therefore, simulating workplaces by using SBL is an effective technique for training students and must be adopted by faculties in Türkiye. Only three out of 60 pharmacy schools in Türkiye use SBL in their clinical pharmacy education. More encouragement and good practice examples in teaching and learning must be provided for those who have yet to implement SBL.

This study marks the first time that students from Ankara University had participated in an online SBL activity. The results from the survey show positive reflections that indicate the country should continue integrating these innovative approaches in clinical pharmacy education.

While implementing a new innovative educational approach, the instructors faced certain challenges. The first challenge was the process obstacles. Students were required to read pre-class materials prior to participating in the online SBL course. Students who did not read the pre-class materials were unable to finish the SBL activity on time. The second challenge was the facility obstacles. Students were required to bring their own

electronic devices or sit in the computer laboratory to access the online SBL course because the computer laboratory had limited capacity. The last challenge was the cultural obstacles. Some students were reluctant to use technology or innovative approaches in learning, which thus negatively affected instructors' ability to teach SBL.

This study has some limitations. By having been conducted in two different settings, the lecture contents and instructors likely had slight differences. This has the ability to affect how students responded to the survey questions. However, the pretest and posttest responses were specific to each student and did not affect the validation process. This study aimed to evaluate the validity of the current Turkish version of the SCLS, so the findings of the study have not come from an observational study. Also, the response rates were not calculated, and the number of participants was more than what had been calculated for the sample size.

In conclusion, the Turkish version of the SCLS is a valid and reliable tool for use with pharmacy students receiving clinical pharmacy education. This version can be widely used to assess the satisfaction and self-confidence of pharmacy students who take online simulation-based learning activity in their clinical pharmacy education.

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