

Development and Psychometric Assessment of Nursing Student's Satisfaction with First Clinical Practical Education Questionnaire: Modified Version

Abstract

Background: The present study aimed to develop an instrument for assessing nursing students' satisfaction with First Clinical Practical Education (SFCPE), and then to test the validity and reliability of the instrument. **Materials and Methods:** In this methodological research, the views of a panel of 15 clinical professors, in terms of the clinical nursing principles and skills training, were used to develop the instrument. The content validity of the instrument was evaluated quantitatively and qualitatively based on the panel's views. The data was collected from the questionnaire completed by 380 second- and third-semester nursing students in 15 medical universities of Iran. The Exploratory Factor Analysis (EFA) was later performed to determine the construct validity of the instrument. The reliability of the instrument and stability analysis were evaluated using the internal consistency test by calculating Cronbach's alpha and by the test-retest method, respectively. **Results:** Throughout the development phase, 16 items were added to the SFCPE instrument, and a 42-item instrument was later developed. During the qualitative and quantitative content validity reviews, the number of added items decreased to 38 items. Finally, a 37-item instrument consisting of seven factors was developed. The Cronbach's alpha coefficients of 0.95 and 0.75–0.9 were obtained for the whole instrument and the factors, respectively. Pearson's correlation coefficient was within the normal range (0.71–1). **Conclusions:** The developed SFCPE is a valid and reliable instrument that can be used for assessing the satisfaction of nursing students in terms of clinical nursing principles and skills.

Keywords: Nursing, personal satisfaction, psychometrics, students

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Introduction

Clinical experience has always been an integral part of nursing education.^[1,2] In the meantime, the first clinical experience is important, since it is the time at which a person confirms the nursing profession as his/her career.^[3] The first encounter or autonomy enhances their learning or makes them more dependent on instructors as a result of fear.^[4] Nursing students feel anxious since they have no skills and knowledge to take care of the patient. For this reason, many nursing students are not satisfied with their clinical education department.^[1]

Dynamic and competitive learning settings along with other challenges have made universities more aware of the importance of student satisfaction.^[5] Satisfaction is defined as the state of mind resulted from

confirming the individual expectations of reality. The lack of a standard definition for satisfaction has become an intricate problem, as measuring student satisfaction is an effective instrument for the development of higher education with desirable quality.^[6] In order to assess the nursing students' perceptions of clinical learning settings, there is a need for valid and reliable instruments that can assess the quality of hospital departments as appropriate clinical learning settings.^[7]

There are various psychometric instruments for measuring students' satisfaction with the dimensions of their curriculum. These instruments include "Nursing Student Satisfaction Scale for the Associate Nursing Programs (NSSANP),"^[8] "Satisfaction with Simulation Experience Scale (SSE),"^[9] "Satisfaction with

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Cultural Simulation Experience Scale (SCSES),”^[10] “Undergraduate Nursing Student Academic Satisfaction Scale (UNSASS),”^[11] and “the evaluation of the Undergraduate Clinical Education Environment Measure (UCEEM).”^[12] “Satisfaction with First Clinical Practical Education (SFCPE),” developed by Asadizaker *et al.*, is another questionnaire that has been recently designed and underwent a psychometric evaluation; it consists of 26 items and seven areas.^[13] As noted, various instruments have been designed to assess the nursing student satisfaction level with nursing education programs in general, in which most of them have focused on the study of the educational setting, and SFCPE is the only instrument that specifically addresses the first clinical practical education.

Up to now, only a single instrument, SFCPE, has been designed to perform the psychometric evaluation to assess the nursing students' satisfaction with the process of the first clinical education experience, and their research is an action research, as well as their study population is limited to the studied students and the expert panel of limited universities; hence, there is a need to develop and re-analyze psychometric evaluation of this instrument. Therefore, the present study aimed to develop and analyze the psychometric evaluation of SFCPE.

Materials and Methods

This study is a methodological research. This study was conducted in medical universities affiliated to the Ministry of Health and Medical Education of Iran from January to October 2017. The development and psychometric evaluation of the SFCPE instrument was performed in three steps as follows. The first step involved the development of the SFCPE instrument, using views of the panel of experts and literature review. In the second step, the validity of the new instrument was evaluated and then corrected. Finally, the reliability of the instrument was evaluated in the third phase.

In this research, the instrument measuring nursing student satisfaction from the first clinical experience, which was designed by Asadizaker *et al.* (2015), was developed. To extract the items in this instrument, the following methods were used: Focus group, literature review, titles, and objectives of nursing internship approved by the Iran's Institute for Research and Planning in Higher Education and Ministry of Health and Medical Education. The content validity was calculated using Content Validity Index (CVI) and Content Validity Ratio (CVR). A total of 26 items were extracted from seven factors including instructor performance, integrated plan, feelings and perceptions, learning atmosphere, scheduling, facilities, and access to professionals using EFA. Cronbach's alpha and Spearman-Brown split-half method were used to examine the internal consistency; the stability was also evaluated using Intraclass Correlation Coefficient (ICC). The Cronbach's alpha coefficients for the first to seven

dimensions and general scale were calculated as 0.92, 0.82, 0.78, 0.73, 0.70, 0.65, 0.60, and 0.92, which are also indicative of an appropriate internal consistency for each dimension of the questionnaire. The Spearman-Brown coefficient was 0.91 and the internal correlation index was 0.926, indicating a high degree of internal consistency and instrument stability, respectively.^[13] The specialist panel's views and the literature review were used to develop the SFCPE instrument in the present study. One of the primary steps in designing the instrument is determining the domain and scope of the intended concept, which can be achieved through a review of studies and interviews by experts as appropriate methods for determining the scope and the concept in question.^[14]

In order to improve the evaluation quality and achieve the desired results at the beginning of this process, theoretical and practical definitions of vocabulary and dimensions of the questionnaire, using the viewpoints of instructors and literature review, were given to 15 research panels consisting of clinical field professors teaching in Tehran University of Medical Sciences, Tarbiat Modares, Shahid Beheshti, Shiraz, Isfahan, Arak, Gilan, Ilam, Kermanshah, and Jahrom, Iran, who were specialized in teaching the clinical skills and principles of nursing and also in performing the psychometric evaluation of nursing education instruments. They were later asked, considering the importance of the subject and the scope of the factors involved in nursing students' satisfaction from the first clinical education experience, to provide the effective proposed items in this area as well as their supplementary and corrective views in written form to develop the instrument. The SFCPE measure was given to the expert panel through email and in person. The proposed items were added to the instrument, corrective changes were made to the items, and the new questionnaire entered the psychometric stage after collecting information obtained from experts' views and literature review and after consulting with the members of the research team.

Validity indicates how much the instrument measures the concept or the construct in question.^[15] The instrument was evaluated in terms of content validity and construct validity in the present research. Evidence of content validity implies the extent to which the term “measurement” encompasses all the major components of the concept.^[16] To determine content validity, two qualitative and quantitative methods were used.

Qualitative validity was confirmed using a technique based on experts' judgment.^[16] In this regard, the instrument was given to 15 experts through email and in person, and they were asked to examine instrument items based on the criteria including using proper words, simplicity, clarity, ambiguity, or conceptual similarity. Corrective changes were made to the instrument after the data collection and the instrument was entered into a quantitative content validity review.

Quantitative content validity analysis was performed using two methods of CVR and CVI. To determine CVR, 15 experts were asked to review each item based on a 3-point scale (It is necessary; it is useful, but not necessary; it is not necessary). Then, the responses were calculated based on the scale.^[17,18] According to the Lawshe Table, items with a CVR of 0.49 (based on the assessment by 15 experts) were maintained [Table 1].^[19]

Waltz and Bausell's method was used to assess the CVI. To fulfill this, the instrument was provided to 15 experts who were later asked to determine the relevance, clarity, and fluency of each item in the instrument using score range of 1–4, in terms of the Waltz and Bausell's content validity index.^[20] The CVI was calculated for each item by dividing the number of experts who were agree with assign ratings 3 and 4 to the item on the total number of experts. In this method, the items with scores of higher than 79 are suitable, between 70 and 79 require correction, and less than 70 are unacceptable.^[21]

EFA was performed to determine the construct validity. EFA is a collection of multivariate statistical processes providing a better understanding of the measured variables by determining a set of main dimensions responsible for the most variance in certain indices.^[22] EFA was performed by principal factor analysis with varimax rotation. Various studies offered different ratios for the sample size required for factor analysis. In this regard, various studies have reported minimum subjects-variables ratio as 3 to 1, 10 to 1, 15 to 1, and 20 to 1.^[23] In the present study, 10 students were considered for each item. Considering that the number of instrument items was 38, 380 nursing students in second and third semesters from the University Medical Sciences of Iran, Shiraz, Ahvaz, Shahid Beheshti, Arak, Hamedan, Lorestan, Kermanshah, Golestan, Qazvin, Kashan, Ilam, Jahrom, Dezful, and Shahrekord were selected using the stratified random sampling and were then enrolled in the study. To ensure the adequacy of the sample size, the Kaiser-Meyer-Olkin (KMO) index, which has 0.94 as a

significant level ($p < 0.001$), was used. Therefore, the data adequacy and capability were confirmed, so that the factor analysis can be performed on them later.

One of the basic criteria for evaluating the instrument quality is reliability. Reliability refers to the instrument's stability in measuring the characteristic in question.^[16] Cronbach's alpha is considered as the best way to evaluate internal consistency. Cronbach's alpha coefficient of <0.7 is satisfactory and <0.8 indicates high internal consistency of the instrument.^[24] The internal consistency of the instrument was measured by calculating Cronbach's alpha separately for each dimension and for the whole scale. Test-retest method was used to evaluate the stability of the questionnaire. To fulfill that, the questionnaire was completed by 15 members of the target group twice with a two-week interval. All data analysis steps were performed using SPSS Ver. 22.

Ethical considerations

The present study was conducted after obtaining permission from the Vice-Chancellor of Research of Jundishapur University of Medical Sciences in Ahvaz with the code of ethics IR.AJUMS.REC.1396.62. After explaining the research goals, the freedom to participate in the study, and confidentiality of the information, the researcher invited university professors and students who were interested to participate in the study.

Results

The subjects were 380 nursing students in second and third semesters. The response rate was 100%. The minimum and maximum age ranges of students were 19 and 23 years, respectively. Also, the majority of them were female (68.40%). A total of 96.40% of students had diplomas. A total of 86.10% and 18.40% students were studying in second and third semesters, respectively. The data were collected from 10 clinical wards, with the general surgery ward accounting for the highest percentage (51%). This questionnaire was distributed among the nursing undergraduate students, studying in 15 universities of medical sciences in Iran.

Instrument development

During the instrument development phase, 16 items related to the nursing students' satisfaction from the first clinical education experience were added to the SFCPE instrument, and a 42-item instrument was later developed.

Content validity

Content validity was evaluated quantitatively and qualitatively. During the qualitative content validity review and after obtaining the experts' views, the statements of 20 items were corrected, the two items were deleted from the total number of instrument items because of their semantic overlapping, and one item was split into

Table 1: Critical values for Lawshe's Content Validity Ratio

Number of panelists	Minimum value
5	0.99
6	0.99
7	0.99
8	0.75
9	0.78
10	0.62
15	0.49
20	0.42
25	0.37
30	0.33
35	0.31
40	0.29

two items. Consequently, the number of items reached 41 items at the end of this stage.

Quantitative content validity review

After calculating the CVI, the two items scored 0.75, which were corrected and maintained according to the research team's views and desired CVI score, and 39 other items obtained the desired score (0.79–1). After calculating the CVR and considering the desired CVR score of 0.49, three items scored 0.46, based on 15 experts' views, and were accordingly omitted. The 42-item instrument was developed into a 38-item instrument after following processes: making changes to the items resulting from the development outcome and the results of qualitative and quantitative content validity analyses performed on the instrument, and modifying the items in the form of deletion, splitting, and correction.

Construct validity

The results of factor analysis showed KMO index rate of 0.94, indicating a sufficient sample size for factor analysis. The Bartlett's test of sphericity also showed the suitability of factor analysis for identifying the structure of the factor model at a significant level ($p < 0.001$) and indicated discoverable relationships between the variables that underwent factor analysis [Table 2].

According to the results of factor analysis with varimax rotation, all questions of the instrument were evaluated with an eigenvalue of 1 [Table 3]. Finally, the resultant 38-item instrument was developed consisting of eight factors. The first, second, third, fourth, fifth, sixth, and seventh factors consisting of 9, 7, 4, 7, 4, 3, and 7 items had factor loadings of 0.39–0.70, 0.41–0.72, 0.53–0.73, 0.42–0.61, 0.53–0.78, 0.53–0.72, and 0.47–0.79, respectively. The eighth factor was omitted as it had only a single item. The results of EFA showed that, after removing one item at this stage, "37-item SFCPE" instrument was classified into seven factors as follows: "Instructor's performance," "Coherence of the curriculum," "Instructor's behavior," "Attention to students' feelings and perceptions," "Emotional atmosphere and learning in the clinical setting," "Creating a favorable condition to enter the profession," and "Creating appropriate learning opportunities," "with 5-point Likert scale," ranging from "Completely satisfied" to "Completely dissatisfied."

Reliability

The reliability of the questionnaire was assessed using an internal consistency test by calculating Cronbach's alpha.

The stability was evaluated by performing the test-retest method and also calculating the intra-cluster correlation index. The internal consistency of 0.95 was obtained for the final version of the 37-item instrument used for the sample of 380 students. Also, the reliability of the instrument for each of the factors was good, with the minimum and maximum Cronbach's alpha values as 0.75 and 0.90, respectively [Table 4]. The instrument stability was assessed by performing a test-retest method, in accordance with the scores obtained from the 15 students at two test intervals (two-week intervals). The Pearson's correlation coefficient was within the normal range (0.71–1), which implies the acceptable stability of the instrument. The results of the reliability assessment showed that the nursing student's Satisfaction with First Clinical Practical Education instrument enjoys a high degree of stability.

Discussion

The framework of the present study focused on the concept of satisfaction from the first clinical education experience. Understanding students' experiences in a clinical setting provides a good perspective for nursing faculties. Accordingly, satisfaction is an important characteristic in nursing education; hence, it is important for making the process of learning more attractive and meaningful.^[25]

The SFCPE instrument was developed based on the experts' views and review of the relevant studies. At the psychometric evaluation phase of the instrument, the results of content validity (qualitative and quantitative), construct validity (exploratory factor analysis), internal consistency (Cronbach's alpha coefficient), and stability (test-retest reliability method) confirmed the validity and reliability of the developed instrument. Finally, a valid and reliable 37-item instrument was developed in seven domains as follows: "instructor's performance," "coherence of the curriculum," "instructor's behavior," "attention to students' feelings and perceptions," "emotional atmosphere and learning in the clinical setting," "creating a favorable condition to enter the profession," and "creating appropriate learning opportunities."

In the present research, "instructor's performance" was recognized as the most important domain for students' satisfaction, which includes nine items on students' satisfaction with the instructor's role in providing appropriate clinical education, training communication skills, continuous interaction with other educational elements, and compliance with training rules. Also, three items of the instructor's performance dimension of the SFCPE instrument remained in this the newly developed instrument. Tavakoli *et al.*'s study showed that most of the students and instructors considered the role of instructor as the most important dimension.^[26] The second domain included coherence of the curriculum, consisting of 7 items. The items in this domain were related to the students' satisfaction with the content of the curriculum, correct

Table 2: KMO* sampling adequacy index and the results of Bartlett's test of sphericity

Items	KMO test	Bartlett's test of sphericity	
		Chi-Square	<i>p</i>
1-38	0.94	9712.89	0.001

*KMO: Kaiser-Meyer-Olkin

Table 3: Factor loadings from exploratory analysis by the items of the SFCPE*

Dimensions	Items	Factors						
		1	2	3	4	5	6	7
Instructor's performance	The instructor provides learning opportunities to observe and engage the students.	0.70						
	The instructor directs and guides students during the implementation of nursing care provided for the patients.	0.67						
	The instructor has enough capability to perform clinical nursing skills.	0.66						
	The instructor teaches skills to the students to effectively communicate with the patients and their families.	0.66						
	The instructor establishes continuous and dynamic engagement with the nurses.	0.65						
	The instructor observes the educational discipline and rules such as timely attending the department, not quitting the internship, etc.	0.60						
	The instructor establishes continuous and dynamic interactions with the head nurse.	0.55						
	The instructor's interest in the nursing profession enhances the students' levels of satisfaction and desire.	0.52						
Coherence of the curriculum	The instructor introduces the students to the staff at the first day of the internship.	0.39						
	The method and instruments of internship assessment are specified by the instructor.		0.72					
	On the first day, the written schedule of the entire unit of internship is given to the students by the instructor.		0.69					
	The performance of each student is evaluated by the instructor using the logbook.		0.66					
	The lesson plan is writing and verbally provided to the students on a daily basis.		0.62					
	Faculty members address the students' needs and problems by monitoring the clinical education process.		0.54					
	Clinical education is implemented in accordance with the goals and schedule of the internship.		0.49					
Instructor's behavior	Head nurse or ward officials are aware of the students' daily schedules.		0.41					
	The instructor treats students with a high degree of patience and calm during the internship.			0.73				
	The instructor's behavior and performance are a good model for students.			0.62				
	The instructor is enough capable of providing accurate and correct answers to students' academic questions.			0.58				
	The instructor has decent approval rating among the students.			0.58				
Attention to students' feelings and perceptions	The instructor gives verbal and non-verbal feedback to students about the care provided by them.				0.61			
	The mental and emotional atmosphere of the clinical learning setting is positive.				0.61			
	Students learn to overcome the stress caused by the first clinical experience with the help of the instructor.				0.59			
	The content of clinical education is designed from simple to complex.				0.56			
	I feel relaxed with my instructor.				0.54			
	There is a harmony between the instructor's expectations and my ability.				0.50			
	The instructor supports students during the internship.				0.42			
Emotional atmosphere and learning in the clinical setting	The nurses' behavior of the ward was friendly with the students in their first contact.					0.78		
	Nurses cooperate with the instructor while training the students.					0.76		
	Nurses and instructors provide the students with required facilities available in the department, such as the blood pressure monitor, educational pamphlets, etc.					0.72		
	The atmosphere of learning settings creates a sense of being a nurse in the students.					0.53		
Creating a favorable condition to enter the profession	The internship provided a good opportunity for students to predict future job responsibilities.						0.72	
	This internship is considered as the first positive clinical experience.						0.65	
	Students feel satisfied at the end of the internship.						0.53	

Contd...

Table 3: Contd...

Dimensions	Items	Factors						
		1	2	3	4	5	6	7
Creating appropriate learning opportunities	There is a good balance between the number of students and instructors, so that the instructor can provide the student with appropriate education.							0.79
	The instructor and the students will have the opportunity to learn and practice techniques during the internship.							0.54
	Students are sufficiently familiarized so that they are well prepared for the clinical setting.							0.47

*SFCPE: Students' Satisfaction with First Clinical Practical Education

Table 4: Principal factor analysis with varimax rotation and Cronbach's alpha coefficients

Dimensions	Number of items	Eigenvalue	Percentage of variance	Cronbach's alpha
First factor	9	1	13.67	0.90
Second factor	7	1	9.52	0.84
Third factor	4	1	9.51	0.84
Fourth factor	7	1	9.48	0.89
Fifth factor	4	1	8.74	0.81
Sixth factor	3	1	6.98	0.81
Seventh factor	3	1	6.09	0.75

notification to students on the procedure of presenting the curriculum, and the coherence between the faculty and the clinical departments in the students' first clinical experience. Three items of the curriculum coherence dimension of the SFCPE instrument remained in this the newly developed instrument. Peters *et al.*^[27] and Yang *et al.*^[28] also confirmed the need to pay attention to the coherent structure of clinical education and enhancement of student learning through the clarification of educational goals, design of appropriate learning activities, and clinical education innovations tailored to the curriculum.

The third domain included the instructor's behavior consisting of three items. This new dimension was not found in the SFCPE instrument; also, it examines students' satisfaction regarding instructors' decent treatment toward students and his/her capability and being a role model. Three items of instructor's performance of the SFCPE instrument were included in this new dimension. Collier also stated that personality characteristics, educational skills, and interpersonal relationships play a decisive role in the effectiveness of his education.^[29] The fourth domain included paying attention to the students' feelings and perceptions consisting of seven items that were related to the students' satisfaction from overcoming the stress caused by the first clinical exposure, and the feeling of calm and the instructor's reasonable expectations, his/her attempts to provide support to the students, and give feedback on their behavior. The item of "attention to students' feelings and perceptions" dimension of the SFCPE instrument was included in the same dimension of the newly developed instrument. Also, it was noted

that nursing students experience a lot of stress during the first year of study, most of which are related to clinical components.^[30] Other studies have placed emphasis on the importance of the supportive, guiding, encouraging, facilitating role of clinical educators along with their clinical competence, good morality, and seriousness of clinical education quality.^[31] The fifth domain included the emotional atmosphere and learning in the clinical setting, consisting of four items that were related to students' satisfaction with clinical facilities and interactions of professional nurses. Two items of the same dimension of the SFCPE instrument were included in this dimension of the newly developed SFCPE instrument. Gemuhay *et al.* pointed out in their study that the characteristics of the clinical setting have a significant effect in this respect, and the alignment of the healthcare objectives with the instructor's educational objectives can have a positive effect on clinical education.^[32] In fact, in the nursing profession, compatibility between the education department and the clinical setting requires cooperation of the instructors of nursing faculties with professional nurses, the realization of which will ultimately ensure the progress of the nursing profession.^[33]

The sixth domain included creating a favorable condition to enter the profession consisting of three items, which are related to the students' satisfaction at the end of the internship period and the creation of an appropriate opportunity for understanding nursing job responsibilities. None of the items of this dimension of the SFCPE instrument was included in the same dimension of the newly developed instrument. Elliot and Shin believed that students' satisfaction assessments make the universities change their plans in accordance with the students' needs and allow them to develop a system to continuously monitor these programs.^[34]

The seventh domain included creating appropriate learning opportunities consisting of three items. This new dimension does not exist in the SFCPE instrument and examines students' satisfaction from the free access to the instructor and the creation of learning opportunities. In a study, emphasis was on the necessity of having an instructor in the department, access to him/her, and cooperation of the instructor with the students in the clinical ward.^[33] For

learning clinical capabilities, students need to gain clinical experience and practice skills by observing, participating, performing clinical procedures, and inferring and managing the patients under the supervision of the instructor, since the goal of clinical education is to provide opportunities for clinical education, so that students can link the theoretical information with practical facts.^[27]

The scheduling and facilities dimensions were not included in the new instrument, and the items of these dimensions were distributed in the other dimensions of the instrument that has been developed. The use of a standard SFCPE questionnaire makes it possible to become aware of features and facilities that are essential for the development of the program, and accordingly, the nursing and midwifery faculties can consider the needs and views of their students in their educational planning on the first clinical experience (clinical nursing principles and skills). This awareness can be also used as a guide to change their curricula in accordance with the students' needs and allow them to develop a system, which is constantly monitoring the nursing curriculum and enhances the students' level of satisfaction. In this study, the validity of Iranian baccalaureate nursing students' satisfaction was explored using the First Clinical Practical Education Questionnaire. Therefore, the findings are not broadly transferable. Consequently, further studies are needed on nursing students worldwide, to explore the validity of this scale.

Conclusion

Attempts were made in the present study, in addition to develop a valid instrument for assessing the satisfaction of nursing students from the first clinical education experience, to inform the reader about the validity of the instrument and its evaluation procedure by providing sufficient information on the process of evaluating the validity and reliability of the instrument. In addition, the results of the study showed that the newly developed SFCPE has desirable psychometric features as well as reliability and validity to assess the nursing students' satisfaction from the first clinical education experience.

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Conflicts of interest

Nothing to declare.

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