

DEVELOPMENT OF A PSYCHOMETRIC SCALE TO MEASURE STUDENT NURSE SATISFACTION WITH THEIR FIRST PRACTICAL CLINICAL EDUCATION

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ABSTRACT

The present study developed and tested a tool exclusively to measure student satisfaction with the training process experienced in their first clinical setting. The 7-factor model accounted for 69.2% of total variance. Cronbach's alpha of internal consistency for the total scale was 0.92,5 and ranged from 0.92 to 0.60 for the 7 subscales. Further investigation is required to develop and evaluate the questionnaire.

Key words: *satisfaction, nursing student, psychometric, clinical practice, scale.*

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Introduction

Nurse educators face the challenge of creating new ways of teaching and facilitating enhanced learning experiences in clinical practice⁽¹⁾. The shortage of nursing programs has been well-described in the literature; those that exist are unable to admit a large number of students because of limited faculty resources⁽²⁾. Current literature stresses the need for nurse educators to move away from the traditional approach of didactic teaching toward one that incorporates the facilitation of learning⁽³⁾.

Since 1930, most clinical teaching has been supervised by a faculty member and organized with a small group of students for one or more patients. Student nurses often provide care for patients in settings that appear alien to them⁽⁴⁾. The majority of Iranian nursing schools, including the School of Nursing and Midwifery of Ahvaz University of Medical Sciences offer clinical education in the conventional manner.

The first exposure to a work environment either improves a student's learning autonomy or makes the student fearful and more dependent on the educators⁽⁵⁾. Nursing students experience anxiety because they feel inadequate and lack the professional nursing skills and knowledge to care for patients in a clinical setting. For this reason, many nursing students are not satisfied with the clinical component of their education⁽⁶⁾.

Satisfaction exerts a greater influence on academic performance than performance exerts on satisfaction. Educational psychologists have found that student satisfaction helps build self-confidence, which in turn helps students develop skills and acquire knowledge⁽⁷⁾; thus, satisfaction can play a major role in the education of professional nurses⁽⁸⁾.

There is increasing evidence of the need to evaluate the quality of nursing education for greater accountability in response to the demands of healthcare institutions and consumers⁽⁹⁾. The literature suggests that there is a gap between theory

and practice^(10, 11, 12). The findings of studies in Iran support the need to rethink clinical skills training in nursing education. The results of these studies confirm that educators should design strategies for more effective clinical teaching⁽⁶⁾.

The increasingly competitive and dynamic educational environment and other challenges have made universities more aware of the importance of student satisfaction⁽¹³⁾. Satisfaction is defined as the psychological state that results from confirmation of expectations about reality. The lack of a standardized definition of student satisfaction is complex, since measuring student satisfaction is regarded as an influential means of developing high quality education⁽¹⁴⁾.

Various psychometric tools have been designed to measure nursing student satisfaction with aspects of their curriculum. These tools include the Nursing Student Satisfaction Scale that measures student satisfaction with nursing programs^(9, 15), the Satisfaction with Simulation Experience Scale⁽⁷⁾ and the Nursing Student Satisfaction with Clinical Learning Environment Inventory⁽¹⁶⁾. Given the lack of reliable and valid tools that exclusively measure nursing student satisfaction in a first clinical environment, the present study developed and tested a tool to measure student satisfaction with the training process experienced in their first clinical setting.

Methods

The steps considered for development of the Satisfaction with First Clinical Practical Education (SFCPE). The study was conducted at the Ahwaz Jundishapur University of Medical Sciences in the city of Ahwaz in Khuzestan province in southwestern Iran. This study was approved by the research deputy and ethics committee of Shahid Beheshti University of Medical Sciences in Tehran, Iran.

Participants

Purposive sampling techniques with maximum variation sampling were used to select participants. The participants were enrolled in the program after receiving a complete explanation of the objectives and protocols of the study. They were assured that their responses would remain anonymous and confidential and that no information that could reveal their identity would be used. The potential participants were informed that participation in the study was voluntary, that they could decline to participate

without penalty and that they had the right to withdraw from the study at any time. Written informed consent forms and oral assents were obtained from all participants.

The first step was item generation by focus groups on the study criteria. The group comprised 42 individuals from the School of Nursing and Midwifery of Ahwaz Jundishapur University of Medical Sciences and affiliated teaching hospitals (Golestan, Imam Khomeini, Razi) who were assigned to train nursing students in the fundamentals of nursing (initial nursing training). Those chosen from the school were the education deputy, nursing department manager, faculty members, second, third, and fourth year undergraduate nursing students, and administrators from the educational administration office. Those chosen from the clinical practice setting were nursing managers, head nurses and staff nurses from different wards of the hospitals under study. Staff nurses were selected by the nursing offices.

An expert panel of 10 participants reviewed the questions for content validation by this means. Expert instructors with previous instructional experience in initial nursing training were invited to develop content validity for the SFCPE. The final version of the questionnaire was completed by 120 nursing students with previous experience initial nursing training experience in different semesters of training.

SFCPE development

Description and scoring of SFCPE scale

The SFCPE scale measures nursing student satisfaction with their first experience in a clinical nursing environment. It is a 26-item questionnaire using the 5-point Likert scale scored with 1 denoting "completely disagree" to 5 denoting "completely agree". A higher score indicates a higher level of student satisfaction with the nursing program.

Development of SFCPE scale

Schwab (1980) states that the process of developing a scale requires several steps as described below⁽¹⁷⁾.

Step 1: item generation

Hunt (1991) believed that there are two primary approaches to generation of items. The deductive approach is used when items are generated on the basis of the theoretical definition of the construct

resulting from a thorough review of the literature. The inductive approach obtains responses from participants by interviews to identify the construct⁽¹⁸⁾. The inductive approach was used to generate items in the present study.

The inductive approach is systematic analysis of qualitative data guided by specific evaluation objectives⁽¹⁹⁾. Focus group methodology is extensively used in different qualitative methods and can be appropriate as an idea-generation tool. A focus group enables participants to share their agreement or disagreement with the subject, enabling all key issues to surface. There is no such interaction among participants in other qualitative and quantitative approaches⁽²⁰⁾.

Focus groups were conducted as suggested by Elliott et al. (2005). Each group included 6 to 10 participants. In the focus discussion sessions, the questions were semi-structured and prepared in advance. Each group of student nurses was asked:

- How has your experience with the Fundamentals of Nursing clinical training course (first clinical practice learning)?
- Describe your experience in the Fundamentals of Nursing training course from the first to the last day.

According to the responses, the next questions asked were:

- What was the role of the teacher?
- What was the role of the staff?

Instructors and clinical nurses were asked:

- What is your opinion of the Fundamentals of Nursing training program?
- Describe your experience with the Fundamentals of Nursing.
- Describe your entire training program.
- Describe your daily routine for clinical education.

As the discussions proceeded, probing questions were used to elicit more in-depth responses about issues of interest that emerged. Two participants were interviewed individually because they did not want to participate in group discussions. The duration of the interviews was 75 to 105 minutes, as dictated by participant circumstances. All interviews were recorded using an MP3 voice recorder and transcribed verbatim.

Qualitative content analysis based on the method proposed by Graneheim and Lundman (2004)⁽²¹⁾ was carried out. The interviews were reread several times to obtain a sense of the whole. The text was condensed and then divided into

meaning units. The condensed meaning units were then abstracted and labeled with a code. A process of reflection and discussion resulted in agreement about how to sort the codes. The various codes were compared based on differences and similarities and sorted into subcategories and categories that constituted the manifest content. The tentative categories were discussed by two researchers and revised as required. What differed between the two researchers was their judgment about what comprised familiar and unfamiliar sensations and actions.

The research team generated 48 items based on focus group discussions, a literature review and suggestions by the expert panel. Item development was a process of mutual collaboration involving repeated review, critique, and revision. The final version of the SFCPE was a 38-item scale.

Step 2: face and content validity

Content validity is the degree to which an instrument is representative of the topic and the process being investigated⁽¹⁸⁾. Content validity was computed as the average percentage of congruency by 10 experts using Waltz & Bausell content validity index (CVI) and the content validity ratio (CVR).

The views of 10 faculty members in related fields were used to distinguish between the CVI of the means and the Waltz and Bausell CVI. The indices examined were relevance, clarity, and simplicity of the questions. The experts were asked to provide the viewpoints they believed should be expressed and to give suggestions for items to be included in the questionnaire. Separate CVIs were calculated for each item. Items that scored higher than 0.80 were retained as questions.

The CVI of each item (I-CVI) was $I-CVI \geq 0.78$ and that for the sum of the items (S-CVI; for 6 to 10 experts) was $S-CVI \geq 0.90$ ⁽²²⁾. The means for items with CVIs between zero and 0.78 were calculated; if the mean was higher than 2, the item was retained. Expert opinion was that 33 items with CVI scores higher than 0.80 were suitable and those with average S-CVI of 0.95 were acceptable.

For the CVR, the questionnaire was given to 10 specialists in the field who were asked to comment on each of the 33 items. A 3-point Likert scale was used (necessary; helpful but not necessary, not necessary). Using the 10 participants and the Lawshea table⁽²³⁾, it was determined that the acceptable CVR was ≥ 0.62 . Of the 33 items, 20 scored higher than 0.62. Of the remaining 13, 5 scored

between 0.40 and 0.70. The items that scored near or overlapped the Lawshea number and which were approved by expert opinion were included in the questionnaire. For the remaining items, if the mean of expert opinion for necessity was ≥ 2 , that item was also included.

Seven students were asked to respond to the 38 items on the questionnaire to determine any ambiguity in meaning and clarity of questions. The questionnaire was again reviewed in light of their scores, expert opinion and student comments. Some items were revised to increase readability and two items with poor scores were excluded. The final questionnaire comprised 28 items. The 5-point Likert scale was scored for completely agree (5), agree (4), no opinion (3), disagree (2), and completely disagree (1).

Step 3: construct validity and reliability

This phase reduced the number of instrument items, determined the underlying structure and dimensionality of items, and identified the reliability of the instrument. The construct validity and reliability of the questionnaire were also assessed.

Construct validity

Exploratory factor analysis (EFA) was used⁽¹⁸⁾ to determine construct validity. EFA is a set of multivariate statistical procedures that reach a more parsimonious understanding of the measured variables through the determination of a set of underlying dimensions (factors) that account for as much of the variance as possible in the given set of observed indicators⁽²⁴⁾.

Reliability

Internal consistency and reliability were measured using SPSS software (v. 16). The reliability of the SFCPE scale was assessed using the Spearman-Brown split half reliability test. The internal consistency of the scale was evaluated using Cronbach's alpha for the total and item-total scores.

To assess the reliability, internal consistency and homogeneity of the questionnaire, its internal consistency reliability coefficient was calculated using Cronbach's alpha⁽²⁵⁾ and the intra-class correlation coefficient (ICC)⁽²⁶⁾. The best method to evaluate internal consistency is Cronbach's alpha. For this score, 0.7 is sufficient, and > 0.80 indicates high internal consistency⁽²⁷⁾.

Results

The position of the participants is shown in Table 1. Of 140 questionnaires distributed, 120 were returned. Four of these questionnaires were incomplete and excluded; a final total of 116 questionnaires were analyzed.

Construct validity

EFA was used to assess the factor composition of the SFCPE scale and the content validity. Nunnally (1978) and Nunnally and Bernstein (1994) believe that factor analysis is crucial to testing the validity of psychological constructs being measured in modern social sciences⁽²⁴⁾.

The factors were extracted based on the results of Bartlett's test of sphericity for testing a hypothesis where the correlation matrix is an identity matrix. The Kaiser-Meyer-Olkin (KMO) score for sampling adequacy⁽⁹⁾ was 0.89; an eigenvalue of >1.0 represented the variance in all items that can be explained by a given factor; a cut-off point of $\geq .40$ for factor loading was used to retain items; and the conceptual considerations were used to place items with the factor.

The resulting the SFCPE 28-item scale was analyzed using the principal factor and Varimax methods. A further two items (items 4 and 25) were dropped because of low factor loading. As a result, 26 items were retained and the 7-factor model accounted for 69.2% of the total variance. Principal component analysis with a Varimax rotation and Kaiser normalization was carried. Rotation converged in 7 iterations (Table 2). Based upon concepts evident in the factors, they were labeled: instructor performance, integrated plan, feelings and perceptions, learning atmosphere, scheduling, facilities and access to professionals.

Reliability

Cronbach's alpha for internal consistency was calculated for 7 subscales (0.92, 0.82, 0.78, 0.73, 0.70, 0.65, and 0.60, respectively) and for the total scale (0.925). The ICC was 0.926 and was good to excellent for the subscales (0.92 to 0.60). The Spearman-Brown coefficient for the SFCPE was 0.91, which suggests high internal consistency. Table 3 shows the results of principal factor analysis with a Varimax rotation and Cronbach's alpha for each dimension of the SFCPE scale.

The questionnaire had two parts. Part 1 introduces the purpose of the study and acquires student

Participants numbers*	Nurse	Head nurse	Clinical/ education supervisor	Administrator of Nursing Services	Nurse Consultant of deputy treatment	Student	Head of education office	Faculty instructor	Director of Nursing group	Deputy Education Faculty
Reconnaissance (Focus Group) -42	3	2	5	3	2	16	1	8	1	1
Expert panel -10	-	-	-	-	-	-	-	10	-	-
Questionnaire completed -116	-	-	-	-	-	116	-	-	-	-

Table 1: Participations frequency according to their position.

Items Factors	Components						
	1	2	3	4	5	6	7
Item 1: Initial training was compatible with my expectations			0.651				
Item 2: Initial training for the first clinical experience was good			0.585				
Item 3: Instructor expectations with the student capabilities were reasonable			0.755				
Item 4: (Dropped after construct validity analysis)							
Item 5: Instructor's relationship with me was good	0.604						
Item 6: Instructor's relationship with head nurse and staff nurses was good	0.75						
Item 7: Instructor was acceptable				0.76			
Item 8: Nurses' relationships with students were good	0.84						
Item 9: Scientific expertise of instructor was good	0.627						
Item 10: Instructor had good mastery over clinical skills	0.627						
Item 11: Training was a good opportunity to put theory into practice							0.757
Item 12: Training moved from the simple to the complex		0.486					
Item 13: Training objectives were predetermined in writing		0.771					
Item 14: Training priorities were predetermined		0.721					
Item 15: Daily training program was predetermined		0.683					
Item 16: Entire training program was predetermined in writing		0.666					
Item 17: Training was a good opportunity to become familiar with the clinical environment							0.669
Item 18: Clinical education was sufficient for the training objective				0.506			
Item 19: Utilization of time spent training was good				0.711			
Item 20: Faculty supervision of the educational process was good				0.69			
Item 21: Mental and emotional atmosphere of the ward was good				0.73			
Item 22: Responsibility of the staff nurses toward student nurses was good				0.616			
Item 23: The number of students and the instructor was proportional						0.668	
Item 24: Training evaluation criteria were clear			0.409				
Item 25: (Dropped after construct validity analysis)							
Item 26: Procedures were recorded in log books		0.467					
Item 27: Adequate facilities were at the disposal of students (if available)						0.646	
Item 28: I am satisfied with the training overall	0.566						

Table 2: Rotated Component Matrix a of the 26-Item SFCPE Scale. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 7 iterations.

background information. Part 2 contained 26 items grouped into 7 subscales with maximum scores: instructor performance⁽³⁰⁾, integrated plan⁽³⁰⁾, feelings and perceptions⁽²⁰⁾, learning atmosphere⁽¹⁵⁾, scheduling⁽¹⁵⁾, facilities⁽¹⁰⁾, access to professionals⁽¹⁰⁾, and overall questionnaire⁽³⁰⁾.

Factors	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Numbers of items	6	6	4	3	3	2	2
Eigenvalue	9.589	2.31	1.654	1.178	1.16	1.094	1.002
Percentage of variance	18.346	12.433	9.389	8.704	8.158	6.56	5.588
Cronbach's alpha	0.92	0.82	0.78	0.73	0.7	0.65	0.6

Table 3: Principal factor analysis with varimax rotation and Cronbach's alpha coefficients.

Discussion

Knowledge of the experiences by students in a clinical setting provides a useful perspective for faculty involved in nursing education⁽⁸⁾. Satisfaction is an important unit of measure in nursing education and it is important to make learning engaging and meaningful. Studies suggest that student satisfaction may correlate with performance⁽⁷⁾. Elliot and Shin (2002) believed that assessment of student satisfaction enables universities to re-engineer their programs to adapt to student needs and allows them to develop a system to continuously monitor how effectively they meet those needs⁽¹³⁾.

In this study, content validity, construct validity, and reliability of the SFCPE were assessed. The SFCPE scale was generally found to have good reliability and validity. The final SFCPE comprised 26 items, including one for overall student satisfaction. The structure of the SFCPE can be used to explore student satisfaction with their first education experience in a clinical setting.

The psychometric proprieties of the SFCPE are generally acceptable in terms of reliability and validity of subscales. This is an important finding and should be factored into decision-making by those invested in nursing student first clinical learning experience.

It should be noted that the first experience in a clinical setting is the cornerstone of their future in professional nursing for all nursing students.

Item analysis

Item analysis examined how each item related to overall scale performance and allowed selection of a set of items that are more strongly related to the underlying concepts⁽⁹⁾. The derived factors should make conceptual sense and be supported by the literature on instruments to measure student satisfaction and also focus on student satisfaction with their first experiences in a clinical setting. The first and second factors included the largest number of items (six items).

Factor one is instructor performance. It comprises items 5, 6, 8, 9, 10, and 28. These items relate to student satisfaction with the instructor's mastery of clinical education, scientific expertise and his/her relationship with the students and practitioners. Faculty nursing instructors are invaluable resources for preparing students for the reality of their professional roles⁽²⁸⁾.

Second factor is the integrated plan. This factor comprises items 12, 13, 14, 15, 16, and 26. These items relate student satisfaction with the trends, objectives, priorities, daily program and totality of the initial training experience. Curriculum is an integrated package and the educational process needs to reflect team functioning⁽²⁹⁾. Oversight and evaluation of the clinical experience is the responsibility of the faculty. Faculty oversight should identify objectives for clinical experience and assess whether or not the objectives are met⁽³⁰⁾. Evaluation of students during clinical training is the most effective factor when matching clinical and theoretical nursing education. Students should remain a written log book throughout training to facilitate learning by recording their experiences⁽³¹⁾.

Factor three is feelings and perceptions. This factor comprises items 1, 2, 3, and 24 that relate to student satisfaction with clear and reasonable educational expectations. Clinical learning in nursing is called practical experience, clinical experience, clinical learning opportunity, clinical strategies or clinical activity⁽³⁰⁾. Experience acquired during earlier practice periods can vary and influence student expectations and confidence. Students often feel stress and anxiety before the first meeting⁽¹⁾.

Factor four is learning atmosphere. It comprises items 7, 21 and 22 that relate to student satisfaction with the mental and emotional environment of

the initial clinical setting. The clinical environment is important for the development of the confidence of the nursing student and fulfillment of intended learning outcomes⁽²⁸⁾. The clinical learning environment is a complex social entity that influences student learning outcomes in the clinical setting. Exploration of this environment gives insight into the educational functioning of the clinical areas and allows nurse instructors to enhance student learning opportunities⁽¹⁰⁾.

Factor five is scheduling. It comprises items 18, 19 and 20 that relate to student satisfaction with scheduling of training objectives and faculty supervision of clinical practice. Nursing schools must focus attention on inter-professional education in undergraduate programs⁽³²⁾ and communicate with students on a regular basis to evaluate the learning experience⁽³⁰⁾.

Factor six is facilities. This factor comprises items 23 and 27 that relate to student satisfaction with the facilities (instructor and equipment) at their disposal in the clinical setting. Problems related to facilities and equipment were the main issues. Consideration of student educational needs, adequate equipment and clinical settings should be positive points of clinical education from the student point of view⁽³³⁾. There is sufficient evidence that faculty shortages exist; the need for additional faculty is recognized by leaders of all nursing schools today⁽³⁴⁾. The shortage of nursing faculty affects the admittance and graduation rates for nursing students⁽³⁵⁾. Most clinical instructors face difficulties during clinical teaching and supervision. Some are dissatisfied with the number of students they supervise per placement and some reported the challenge of assignment of a large number of students during clinical placement⁽³⁶⁾.

Factor 7 is access to professionals and comprises items 11 and 17. These items relate to student satisfaction with the opportunity to put the theory learned into practice and become familiar with the clinical environment. Clinical practice includes understanding the organization and systems, development of leadership skills, evidence-based practice, and inter-professional collaboration and communication⁽³⁰⁾. Preparing to enter in clinical setting is the foundation of to the feeling of belonging in a clinical environment⁽³⁷⁾.

Important conditions for nursing student learning and motivation in clinical studies include individual, relational, and organizational aspects. This includes student recognition of nurses' pedagogical

and professional competence and their large workloads⁽³⁸⁾.

Conclusion

The results of this study showed that the SFCPE questionnaire is a valid and reliable instrument. Future research should focus on establishing test-retest reliability and CFA. Improving the internal consistency of the instrument will increase its utility and credibility as a valid and reliable measure of student nurse satisfaction. To address this limitation, future study should examine the stability of the instrument over a longer period.

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