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# Perceived Competence and Training Priorities of Korean Nursing Simulation Instructors

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## KEYWORDS

competence;  
importance-  
performance  
analysis;  
needs assessment;  
nursing;  
patient simulation

## Abstract

**Background:** The expertise of the simulation instructor is a key factor in the success of simulation-based education. This study aimed to identify the perceived competence and training priorities of Korean nursing simulation instructors using importance-performance analysis.

**Methods:** A cross-sectional descriptive survey design was used. A Web-based survey was conducted with 100 nursing simulation instructors from seven provinces of the Republic of Korea. A 26-item simulation instructor competence importance-performance scale was developed and used to identify the instructors' perceived competence and training priorities.

**Results:** Exploratory factor analysis of the scale comprised five factors that explained 66.5% of the total variance: (a) professional foundations, (b) assessment and evaluation, (c) simulation implementation, (d) reflection and facilitation, and (e) principles of simulation education. There were significant mean differences between importance and performance overall and for all five factors, with reflection and facilitation showing the largest difference. Regardless of instructor expertise level, an in-depth discussion during the debriefing was the top training priority for novice, advanced beginner, and competent instructors in the importance-performance analysis.

**Conclusions:** Structured simulation instructor training should be developed and implemented to target simulation instructor competence improvement according to training priorities customized by expertise level.

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In Korea, nursing schools operate outcome-based curricula to achieve the program learning outcomes proposed by the [Korea Accreditation Board of Nursing \(2017\)](#). Patient simulation methodology is a useful tool for outcome-based curriculum as

it simulates situations that can occur in the clinical area, and it provides opportunities for clinical reasoning and problem solving in simulated environments. Few systematic reviews and meta-analyses have confirmed positive learning outcomes of patient simulation in terms of knowledge, skills, or attitudes ([Oh, Jeon, & Koh, 2015](#); [Shin, Park, & Kim, 2015](#)). According to the recently revised Korean nursing education certification

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evaluation standards, simulation practice as a substitute for clinical placement increased to 12% of the total clinical placement hours over the last 5 years (Korea Accreditation Board of Nursing, 2017). Moreover, because patient safety is emphasized in Korea, there are limited clinical placements for the

### Key Points

- This study aimed to identify the educational needs of nursing simulation instructors.
- Simulation instructor training is essential for preparing competent instructors.
- The largest gap between importance and performance was in reflection and facilitation.

expanded numbers of newly established nursing schools, and it is expected that patient simulation will be applied even more. However, Korean nursing educators have reported insufficient manpower and time as the obstacles to the use of simulation in nursing education (Lee, Kim, & Oh, 2011). Added to this challenge is the growth of nursing schools in Republic of Korea that have increased by 53.4% from 133 in 2008 to 204 in 2017 according to the Korean Nurses Association

statistics (Hong & Cho, 2017).

With the initiation of the third cycle Korean nursing education certification evaluation, interest in developing faculty who are adept with simulation-based nursing curricula is increasing. In the United States, the Society for Simulation in Healthcare (SSH, 2012) developed standards for simulation instructors and provides qualification certification. However, in Korea, the guidelines for simulation instructor core competencies and working standards are insufficient. The limitation of the previous studies that evaluated the effectiveness of simulation training programs is that they focused primarily on the technical aspects of the simulation operation with little regard for the competence of simulation instructors and their contribution (Issenberg, 2006). As a result, there are little data to categorize simulation instructor by competence level.

## Background

### Simulation Instructor Competence

Instructor competence centers on effectively fulfilling the expected standards for a given occupation or job activity as an integrated set of knowledge, skills, and attitudes (International Board of Standards for Training, Performance and Instruction, 2003). Simulation instructor competence is very important, along with education resources, for effectively fulfilling curricula and inducing positive learning outcomes (Issenberg, 2006; Jeffries, Dreifuert, Kardong-Edgren, & Hayden, 2015; Landeen et al., 2015).

Although the concept of simulation instructor competence has not yet been uniformly defined, the SSH (2012) has outlined four instructor standards: (a) professional values and

capabilities; (b) knowledge of educational principles, practice, and methodology in simulation; (c) implementing, assessing, and managing simulation-based educational interventions; and (d) scholarship, that is, a spirit of inquiry and teaching.

The International Nursing Association for Clinical Simulation and Learning (INACSL) revised its Standards of Best Practice Simulation<sup>SM</sup> to include the following categories that simulation educators should become proficient: (a) simulation design, (b) outcomes and objectives, (c) facilitation, (d) debriefing, (e) participant evaluation, (f) professional integrity, and (g) simulation-enhanced interprofessional education (INACSL Standards Committee, 2016a).

The National League for Nursing suggests nine areas for simulation faculty development: (a) comfort in using technology, (b) simulation scenario design, (c) debriefing, (d) facilitating simulation using a range of teaching/learning strategies, (e) strategic curriculum integration, (f) evaluation skills for summative and formative assessment, (g) understanding the role of realism/fidelity, (h) skills to use standardized/simulated patients, and (i) simulation management (Kellgren et al., 2016). This framework is supported by several evidence-based reviews and commentaries on the effectiveness of simulation for learning outcomes (Cheng et al., 2016; Issenberg, McGaghie, Petrusa, Lee Gordon, & Scalse, 2005; Motola et al., 2013; Topping et al., 2015).

Simulation instructors can implement practical strategies to enhance learner centeredness during debriefings: (a) identifying the learner agenda, (b) prioritizing content for discussion, (c) promoting learner self-assessment, (d) exploring rationale for behaviors, (e) closing performance gaps, (f) managing transitions, (g) managing time, and (h) identifying key take-home messages (Cheng et al., 2016).

### Simulation Instructor Training

Simulation instructor training programs can use multiple theoretical frameworks including adult learning principles, experiential learning, and situated learning (French & Hales, 2016); the Jeffries Nursing Education Simulation Framework (Jeffries et al., 2015); Benner's Novice to Expert framework (Waxman & Telles, 2009); and the theory of planned behavior (Jones, Fahrenwald, & Ficek, 2013; Kim, Park, & O'Rourke, 2017; King, Moseley, Hindenlang, & Kuritz, 2008). It is important to set training agendas that outline necessary set instructor competencies (Jeffries et al., 2015).

The National Council of State Boards of Nursing simulation guidelines for prelicensure nursing programs stress faculty preparedness to lead simulations (Alexander et al., 2015). Simulation instructors develop and strengthen their competencies through workshops, seminars, short courses, fellowship programs, certification, graduate courses (Cheng et al., 2015; Hallmark, 2015), and online learning (Kim et al., 2017). Informal approaches to instructor development are peer coaching, mentorship and role modeling, work-based learning, and communities of practice (French &

Hales, 2016). Some authors have suggested faculty development programs that progressively build skills with increasing complexity at each level (Peterson, Watts, Epps, & White, 2017; Waxman & Telles, 2009).

There is evidence that faculty training can overcome the barriers to integrate simulation into curricula (Beroz, 2017; Taibi & Kardong-Edgren, 2014). In one study, after the instructor training program, 90% of the 12 educational institutions in 1 region increased their use simulation, and 80% replaced some of their clinical placement hours (Bentley & Seaback, 2011). In other studies, training programs were developed for increasing simulation instructor competence, and the authors reported the effects of the application through a single-group pre-post design. Participants in simulation instructor training programs have reported positive effects on knowledge (Bøje et al., 2017; Chung, Issenberg, Phrampus, Miller, & Je, 2012; Cockerham, 2015; Kim et al., 2017), skills (Chung et al., 2012), self-efficacy (Paige, Arora, Fernandez, & Seymour, 2015), attitudes (Chung et al., 2012), confidence (Bøje et al., 2017), and satisfaction (Nestel et al., 2016). In previous studies in which authors applied the theory of planned behavior, some reported positive attitude changes in the instructors after the training programs (King et al., 2008; Kim et al., 2017; Roh, Kim, & Tangkawanich, 2016). Conversely, there were no significant differences in attitudes to teaching with simulation before and after participating in the training program (Jones et al., 2013).

In summary, although simulation instructor competence is very important for teaching effectiveness and several models for specific competencies have been reported, there has not been a unified conceptual framework to guide its formal evaluation and research. Because previous faculty-development programs on simulation pedagogy have led to favorable learning and attitudes, it is suggested that the expertise of the simulation instructor is a key factor for the success of simulation-based education. Therefore, it is necessary to develop and implement an evidence-based training program with experiential learning according to the instructors' expertise levels and training priorities.

## Purpose

The purpose of this study was to create and evaluate a perceived competence assessment tool for Korean nursing simulation instructors and identify the training priorities for instructor development curricula using importance-performance analysis.

## Methods

### Design

A cross-sectional descriptive survey was conducted.

## Participants

We calculated an estimated minimum of 85 participants using Cochran's sample size formula, with an alpha of 0.05 and a margin of error of 0.03 given a population size of 300 (Bartlett, Kotrlik, & Higgins, 2001). A total of 291 faculty members or instructors who had implemented simulation-based nursing education at least once in a semester within the past 3 years were invited to participate in a Web-based survey. They were selected from the member list of the Korean SSH or the Korea Nursing Simulation Society. We included returned data from 100 instructors for final analysis, a response rate of 34.3%.

## Measures

### General Characteristics

General characteristics including age, gender, academic degree, location, clinical experience, simulation instructor experience, training experience, self-rated expertise as a simulation instructor, and membership of simulation association were surveyed. Participants rated their own perceived expertise as a simulation instructor in education and research in one of three categories: (a) novice, (b) advanced beginner, and (c) competent.

### Importance-Performance of Competence Scale

The participants completed a self-administered 50-item Importance-Performance of Competence Scale that the authors developed based on the SSH's certification standards and elements (SSH, 2012) and a literature review (Boese, Cato, & Gonzalez, 2013; Topping et al., 2015). The initial draft of the instrument was validated by 10 Korean experts in simulation-based nursing education using a Content Validity Index. The scale-level Content Validity Index was 0.93 for the overall scale.

Participants responded to each of the 50 items on a 4-point Likert-type scale to assess the perceived importance and performance of competence attributes. Scores ranged from 1 (low importance or poor performance) to 4 (high importance or excellent performance), with higher scores indicating greater importance and performance. The scale demonstrated high internal consistency for importance and performance, with Cronbach's alphas of 0.97 and 0.95, respectively.

### Procedure

The Institutional Review Board of Chung-Ang University approved this study (approval no.: 1041078-201706-HRSB-118-01), and participants submitted informed consent. A self-administered, Web-based questionnaire was sent via e-mail to these 291 simulation instructors along with a letter describing the study overview and respondent anonymity. We collected data from December 1 to 15, 2017.

## Data Analysis

Data were analyzed using IBM SPSS Statistics for Windows, version 23.0 (IBM Corp., Armonk, NY). Analyses include descriptive statistics for demographic characteristics, exploratory factor analysis to assess validity, and Cronbach's alpha coefficients to assess the reliability of the scale. An exploratory factor analysis with a principal axis factoring approach and varimax rotation was used to investigate the scale's construct validity.

Paired t test was used to determine differences between importance and performance. The relationship between the importance and the performance was examined using SPSS with data plotting (Martilla & James, 1977). Through the importance-performance analysis, we confirmed the items with high importance but low performance (Quadrant 2), which indicated the highest training priority for simulation instructors. We used one-way analysis of variance to compare the differences in competence scores among novice, advanced beginner, and competent simulation instructors. This category was based on a previous study (Waxman & Telles, 2009).

## Results

### Demographic Characteristics of Participants

Table 1 shows the demographic characteristics of simulation instructors. The average age of the 100 respondents was  $43.82 \pm 6.92$  years, and 51 (51%) were in their 40s. Ninety-eight (98%) participants were female, 67 (67%) had doctoral degrees, 55 (55%) were assistant professors, and 27 (27%) were from Seoul. The average duration of clinical experience as a nurse was  $126.04 \pm 83.70$  months, and the mean months of simulation instructor experience was  $47.35 \pm 37.03$ , with the majority of respondents (55%) having between 1 and 5 years of experience. Ninety-eight (98%) participants reported they had simulation instructor training experience, and 71 (71%) were members of the simulation association.

### Exploratory Factor Analysis

Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure were analyzed to identify the underlying assumptions for exploratory factor analysis. Bartlett's test of sphericity was significant ( $\chi^2 = 1728.71$ ,  $p < .001$ ), which indicated that the correlation matrix was not an identity matrix. The KMO measure of sampling adequacy was appropriate (0.86), suggesting that a factor analysis was appropriate and could be expected to yield common factors.

The factor loadings for the rotated five-factor solution from 100 responses to items on the scale are presented in Table 2. We interpreted and labeled factors based on the SSH's certification standards (SSH, 2012) and our literature review: (a)

professional foundations (seven items); (b) assessment and evaluation (five items); (c) simulation implementation (five items); (d) reflection and facilitation (six items); and (e) principles of simulation education (three items). These five factors explained 66.5% of the total variance.

### Importance-Performance Analysis

Table 2 shows the mean importance and performance scores for the 26 items. On the four-point scale, the item with the highest importance was "set measurable learning objectives" ( $3.74 \pm 0.46$ ), and the item with the lowest importance was "include evaluations on trainees, instructors, simulation-based experiences, and support teams" ( $2.97 \pm 0.73$ ). On the 4-point scale, the item with the highest performance was "understand the overall education goal and characteristics of individual curricula/programs" ( $3.59 \pm 0.49$ ) and that with the lowest performance was "include evaluations on trainees, instructors, simulation-based experiences, and support teams" ( $2.85 \pm 0.80$ ).

Table 2 shows the mean differences between the importance and performance scores; there was a significant overall difference between the mean scores ( $3.45 \pm 0.36$  [importance] vs.  $3.29 \pm 0.45$  [performance];  $t = 4.198$ ;  $p < .001$ ). The mean for "reflection and facilitation" shows the largest difference ( $t = 4.339$ ;  $p < .001$ ), and the smallest difference was for the "simulation implementation" score ( $t = 2.300$ ;  $p = .024$ ).

Figure shows the importance-performance matrix for each competence component according to the simulation instructor expertise level (novice, advanced beginner, or competent); the items with high importance but low performance (Quadrant 2) indicated the highest training priorities for simulation instructors. The top training priority for novice and advanced beginner instructors were "continue to participate in expert training and development" and "during debriefing, induce in-depth discussions in which learners can sufficiently reflect on what they have conducted." The top training priorities for competent instructors were "be aware of technical issues," "during debriefing, induce in-depth discussions in which learners can sufficiently reflect on what they have conducted," and "identify and comply with the knowledge on ethical issues and ethical standards when designing and conducting educational activities in simulation environments."

### Comparison of Competence Scores by Perceived Instructor Expertise

Overall simulation instructor competence differed significantly among the three groups,  $F(2, 97) = 6.510$ ,  $p = .002$ . Scheffe post hoc tests indicated that the overall competence of novice instructors was significantly lower than that of the advanced beginners ( $p = .020$ ) and the competent instructors ( $p = .002$ ; Table 3).

**Table 1** Demographic Characteristics of Participants (N = 100)

Variable	Category	Mean ± Standard Deviation or n (%)
Age (year)		43.82 ± 6.92
	28-30	5 (5.0)
	31-40	30 (30.0)
	41-50	51 (51.0)
	51-60	12 (12.0)
	61-64	2 (2.0)
Gender	Women	98 (98.0)
	Men	2 (2.0)
Academic degree	Baccalaureate	6 (6.0)
	Master's	19 (19.0)
	Doctorate	67 (67.0)
	Postdoctorate	8 (8.0)
Position	Assistant professor	55 (55.0)
	Associate professor	16 (16.0)
	Professor	5 (5.0)
	Nurse	11 (11.0)
	Others	13 (13.0)
Location	Seoul	27 (27.0)
	Gyeonggi	17 (17.0)
	Gyeongsang	17 (17.0)
	Chungcheong	16 (16.0)
	Jeolla	13 (13.0)
	Gangwon	5 (5.0)
	Jeju	5 (5.0)
Clinical experience (months)		126.04 ± 83.70
	14-60	23 (23.0)
	61-120	36 (36.0)
	121-180	18 (18.0)
	181-240	12 (12.0)
	241-391	11 (11.0)
Simulation instructor experience (months)		47.35 ± 37.03
	1-12	21 (21.0)
	13-60	55 (55.0)
	61-120	20 (20.0)
	121-180	4 (4.0)
Training experience	Yes	98 (98.0)
	No	2 (2.0)
Membership of simulation association	Yes	71 (71.0)
	No	29 (29.0)

## Discussion

In this study, we identified the perceived competence and training priorities of Korean nursing simulation instructors using importance-performance analysis. Regarding the competence of the instructors, we identified five competence attributes that explained 66.5% of the total variance: (a) professional foundations, (b) assessment and evaluation, (c) simulation implementation, (d) reflection and facilitation, and (e) principles of simulation education. The explained variance in our study is acceptable, exceeding the recommended value of 50% (Beavers et al., 2013), and these five attributes are similar to the standards proposed by major simulation-related organizations (INACSL Standards Committee, 2016a; SSH, 2012). Our results also support

three competence categories such as knowledge, skills and behaviors, and comportment (Topping et al., 2015). To apply simulation methodology efficiently, the instructor needs to be trained based on the shift from the existing passive teacher-centered to learner-centered instruction. Instructor preparedness in simulation methodology can influence learner engagement and learning outcomes (Harder, Ross, & Paul, 2013). Although a number of study authors emphasized the importance of simulation instructor training for promoting their competencies (Adamson, 2015; Arthur, Levett-Jones, & Kable, 2013; Jeffries et al., 2015), only one author has identified nursing simulation instructors' competence attributes (Topping et al., 2015). Accurate and timely assessment of instructor competence can be a basis for developing a training program. Our study's

**Table 2** Factor Loadings and Total Variance Explained from the Rotated Factor Structure Matrix for the Simulation Instructor Competence Scale (N = 100)

Items	Importance		Performance		Factor				
	Mean	Standard Deviation	t	p	I	II	III	IV	V
Professional foundations	3.36 ± 0.46	3.16 ± 0.60	3.930	<.001					
Participate in and contribute to a group specialized in simulation	3.33 ± 0.60	3.10 ± 0.82	2.823	.006	.842				
Continue to participate in expert training and development	3.59 ± 0.53	3.26 ± 0.75	4.464	<.001	.774				
Perform research and investigation to identify and solve the problems centered on simulation education and practical affairs and develop the ability to use the result and to ask study questions	3.36 ± 0.61	3.11 ± 0.78	3.718	<.001	.716				
Acquire the newest knowledge on simulation through literature subscriptions, comments on articles, journal clubs, and literature searches	3.32 ± 0.66	3.24 ± 0.71	1.111	.269	.703				
Take leadership in developing and distributing curricula	3.28 ± 0.67	3.13 ± 0.72	1.981	.050	.664				
Use the research results to identify and solve problems centered on simulation education and practical affairs	3.42 ± 0.59	3.24 ± 0.68	2.739	.007	.650				
Be recognized as a person who is considered a simulation expert or a person related to simulation in the affiliated institution	3.24 ± 0.65	3.04 ± 0.76	2.814	.006	.625				
Assessment and evaluation	3.57 ± 0.40	3.43 ± 0.47	3.207	.002					
Develop measurement standards (checklists and overall evaluation scales)	3.46 ± 0.63	3.33 ± 0.62	1.680	.096		.633			
Set measurable learning objectives	3.74 ± 0.46	3.58 ± 0.52	2.602	.011		.613			
Evaluate the learning outcomes	3.53 ± 0.56	3.48 ± 0.56	.962	.338		.609			
Integrate the simulations within the curricula	3.51 ± 0.63	3.34 ± 0.70	2.740	.007		.559			
Provide preparation materials and data so that the learners can achieve learning objectives and expected results of the simulation-based experiences	3.60 ± 0.51	3.44 ± 0.56	2.753	.007		.483			
Simulation implementation	3.28 ± 0.51	3.16 ± 0.59	2.300	.024					
Understand the basic principles of operating the simulation center	3.36 ± 0.67	3.32 ± 0.69	.553	.582			.728		
Be aware of the basic principles of the theory of learning by experience	3.18 ± 0.69	3.12 ± 0.74	.786	.434			.644		
Be aware of technical issues (e.g., video capture, simulation errors, consumables)	3.32 ± 0.63	3.17 ± 0.74	2.138	.035			.610		

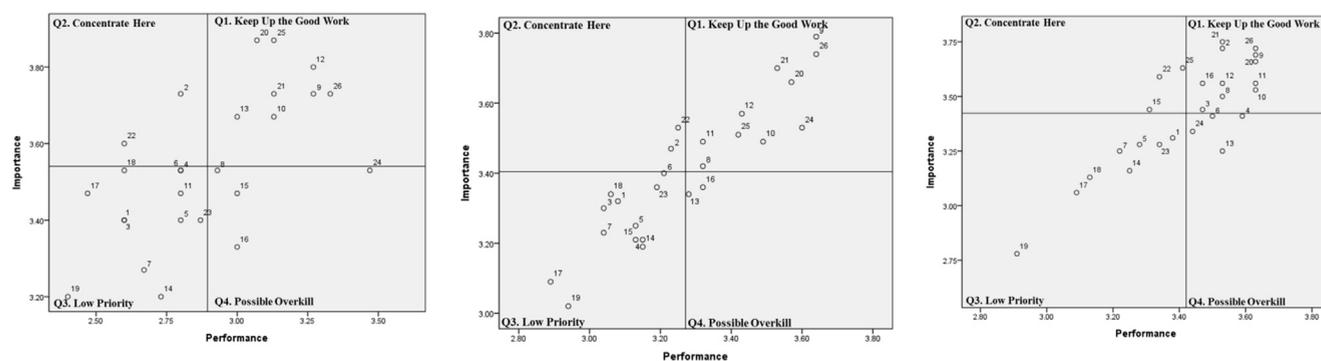
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**Table 2** (continued)

Items	Importance	Performance	t	p	Factor				
	Mean ± Standard Deviation				I	II	III	IV	V
Provide case blueprints or tables that outline clinical skills to be taught or evaluated using the simulation	3.42 ± 0.64	3.32 ± 0.72	1.342	.183			.549		
Use the standardized patient for education, practical affairs, and evaluation purposes	3.14 ± 0.84	2.89 ± 0.98	2.529	.013			.499		
Reflection and facilitation	3.43 ± 0.43	3.20 ± 0.55	4.339	<.001					
Perform instructor self-evaluation of simulation strategy	3.30 ± 0.78	3.01 ± 0.83	3.214	.002					.804
Include evaluations of trainees, instructors, simulation-based experiences, and support teams	2.97 ± 0.73	2.85 ± 0.80	1.560	.122					.699
Develop, mentor, and guide learners	3.70 ± 0.48	3.51 ± 0.58	3.092	.003					.607
Maintain a promotional approach centered on participants in accordance with learners' learning objectives, knowledge, education levels, and expected results	3.72 ± 0.47	3.47 ± 0.59	4.103	<.001					.536
During debriefing, induce in-depth discussions in which learners can sufficiently reflect on what they have conducted	3.56 ± 0.61	3.18 ± 0.76	4.670	<.001					.533
Assess needs to provide the evidence that grounds well-designed simulation-based experiences	3.34 ± 0.65	3.19 ± 0.71	2.055	.043					.492
Principles of simulation education	3.60 ± 0.43	3.50 ± 0.49	2.356	.020					
Keep the contents and results of simulation scenarios confidential according to institutional policies or procedures	3.47 ± 0.63	3.53 ± 0.63	-1.136	.259					.746
Identify and comply with the knowledge on ethical issues and ethical standards when designing and conducting educational activities in simulation environments	3.60 ± 0.59	3.37 ± 0.66	3.543	.001					.671
Understand the overall education goals and characteristics of individual curricula and programs	3.73 ± 0.45	3.59 ± 0.49	2.542	.013					.547
Total	3.45 ± 0.36	3.29 ± 0.45	4.198	<.001					
Eigen value					4.648	3.502	3.496	3.298	2.355
Percentage of variance					17.879	13.470	13.445	12.684	9.057
Cumulative percentage					17.879	31.348	44.793	57.476	66.533

nursing simulation instructor competence scale can be used as a needs assessment tool for prioritizing training needs among instructors.

We identified that the largest gap between importance and performance in simulation instructor competence was in reflection and facilitation. Some researchers also



A. Novice instructors (n = 15)                      B. Advanced beginner instructors (n = 53)                      C. Competent instructors (n = 32)

**Figure** Importance-performance matrix by expertise of nursing simulation instructors.

emphasize the importance of evaluation and facilitation skills for simulation instructors (Topping et al., 2015); evaluating the effects of simulation application is complex for instructors, but it is an essential step in planning, implementing, and continuously improving a successful simulation program (Boese et al., 2013). The use of simulation methodology is challenging for instructors because it requires competence and working knowledge of technology (Harder et al., 2013). As learning facilitators, simulation instructors can guide learners in constructivist approaches to learning and give feedback during debriefing (Issenberg, 2006). Effective facilitation requires facilitators with specific skills and knowledge in simulation pedagogy. Facilitation methods can be applied before, during, and after simulation-based experience (INACSL Standards Committee, 2016b). In particular, we identified reflection and facilitation competence as the largest performance gap, and therefore, instructors in training require ongoing support and training to help them to adjust to and promote their roles.

Results indicated that inducing in-depth discussions during debriefings was the top training priority for novice, advanced beginner, and competent instructors. This result

supports a Delphi study’s result in which debriefing techniques were very highly ranked among 32 international experts in simulation-based nursing education (Arthur et al., 2013). A concept analysis defined simulation debriefing as a structured and guided reflection process in which students actively appraise their cognitive, affective, and psychomotor performance in the contexts of their clinical judgments (Al Sabei & Lasater, 2016). Our results also support a well-known assumption that debriefing is an essential component of simulation-based education to accomplish education goals (Bowe, Johnson, & Puscas, 2017; Cheng et al., 2016). A comprehensive structured faculty development program that addressed predefined learning needs would likely provide the best opportunity to enhance and maintain debriefing skills (Cheng et al., 2015). Some studies present positive effects of simulation instructor training programs to promote debriefing skills using peer coaching (Cheng et al., 2017) and workshops (Cockerham, 2015; Paige et al., 2015). Therefore, ongoing training programs should be applied along with debriefing guides so that simulation instructors can understand the basic concepts of structured debriefing and apply them successfully in simulation-based education.

**Table 3** Comparison of Competence Scores by Perceived Instructor Expertise (N = 100)

Factor (No. of Items)	Novice (a) (n = 15)	Advanced Beginner (b) (n = 53)	Competent (c) (n = 32)	F	p	Scheffe Test
	Mean ± Standard Deviation					
Professional foundations (7)	2.72 ± 0.60	3.12 ± 0.59	3.42 ± 0.49	8.124	.001	a < c
Assessment and evaluation (5)	3.08 ± 0.53	3.44 ± 0.41	3.59 ± 0.45	6.799	.002	a < b, c
Simulation implementation (5)	2.84 ± 0.62	3.15 ± 0.55	3.33 ± 0.60	3.718	.028	a < c
Reflection and facilitation (6)	2.78 ± 0.53	3.25 ± 0.53	3.31 ± 0.51	5.888	.004	a < b, c
Principles of simulation education (3)	3.31 ± 0.48	3.55 ± 0.48	3.49 ± 0.51	1.427	.245	
Total	2.95 ± 0.49	3.31 ± 0.42	3.43 ± 0.42	6.510	.002	a < b, c

The limitations of this study are as follows. First, we developed a reliable and valid nursing simulation instructor competence tool. However, the KMO test score of sampling adequacy was 0.86, and thus, additional studies are needed to validate the tool with larger sample sizes. Second, although we developed the tool based on a literature review and on analyzing the tools from previous studies, it is necessary to be careful in interpreting our results when the tool is applied to other health-care professionals or to simulation instructors in other countries.

## Conclusion

In simulation-based training, simulation instructor training is essential for preparing competent instructors. Our results showed that competence attributes for nursing simulation instructors comprised professional foundations, assessment and evaluation, simulation implementation, reflection and facilitation, and principles of simulation education. Importance-performance analysis identified the largest gap in reflection and facilitation among simulation instructors. Promoting in-depth discussions during debriefing was the top training priority for novice, advanced beginner, and competent instructors. That is, simulation instructor competence can be attained through need-based training according to expertise level. Further studies are needed to verify the immediate and long-term effects of simulation instructor training programs developed and implemented based on the training priorities of nursing simulation instructors.

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