Original Article

The impact of simulation education on self-efficacy towards teaching for nurse educators

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GARNER S.L., KILLINGSWORTH E., BRADSHAW M., RAJ L., JOHNSON S.R., ABIJAH S.P., PARIMALA S. & VICTOR S. (2018) The impact of simulation education on self-efficacy towards teaching for nurse educators. *International Nursing Review* **00**, 000–000

Aim: The objective of this study was to assess the impact of a simulation workshop on self-efficacy towards teaching for nurse educators in India. Additionally, we sought to revise and validate a tool to measure self-efficacy in teaching for use with a global audience.
Background: Simulation is an evidence-based teaching and learning method and is increasingly used in nursing education globally.
Introduction: As new technology and teaching methods such as simulation continue to evolve, it is important for new as well as experienced nurse educators globally to have confidence in their teaching skills and abilities.
Methods: The study included (1) instrument revision, and measures of reliability and validation, (2) an 8-h faculty development workshop intervention on simulation, (3) pre- and post-survey of self-efficacy among nurse educators, and (4) investigation of relationship between faculty socio-demographics and degree of self-efficacy.
Results: The modified tool showed internal consistency ($r = 0.98$) and was validated by international faculty experts. There were significant improvements in total self-efficacy ($P < 0.001$) and subscale scores among nurse educators after the simulation workshop intervention when compared to pre-survey results. No significant relationships were found between socio-demographic variables and degree of self-efficacy.
Discussion: Strong self-efficacy in teaching among nurse educators is crucial for effective learning to occur.
Conclusions and implications for nursing: Results indicated the simulation workshop was effective in significantly improving self-efficacy towards teaching for nurse educators using an internationally validated tool.
Implications for nursing policy: The Minister of Health in India recently called for improvements in nursing education. Introducing nursing education on simulation as a teaching method in India and globally to improve self-efficacy among teachers is an example of a strategy towards meeting this call.

Keywords: Health Policy, India, Nurse Educators, Self-Efficacy, Simulation, Tool Revision

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Funding
This study was funded by a Fulbright-Nehru Research Flex Grant # 2016/APE(R-Flex)/131.
Conflict of interest
No conflict of interest has been declared by the authors.

International Nursing Review

Introduction

Simulation is an evidence-based teaching and learning method that has been used in prelicensure nursing education in high-income countries for a number of years (Hayden et al. 2014) and is a growing practice around the world. Embedding evidence-based, culturally appropriate, teaching and learning modalities such as simulation into nursing curricula is imperative to improving nursing education globally. Limited research exists on approaches to improve faculty self-efficacy towards teaching simulation, particularly in countries with emerging economies such as India, where new teaching methods such as nursing simulation are on the rise (Garner et al. 2017; Okrainec et al. 2009). The primary purpose of this study was to assess the impact of a simulation workshop on self-efficacy towards teaching for nurse educators in India. A secondary aim was to revise, update and validate a tool to measure self-efficacy in teaching and test its reliability.

Background

Self-efficacy as expressed by Bandura (1977) is an individual's perception of one's capacity to perform at various levels. Teacher self-efficacy in nursing education is founded in part on the confidence of the faculty member in being able to 'select, use, and modify appropriate teaching strategies' (Nugent et al. 1999, p. 231). As new teaching strategies are being introduced in India, it is vital to ascertain the teacher self-efficacy of the Indian nursing faculty. According to Britton (2017), higher self-efficacy is achieved by understanding and experience which influences teaching behaviours, and professional development and is integral to increasing self-efficacy.

Measuring self-efficacy in teaching

Nugent et al. (1999) assessed self-efficacy of four central aspects of teaching using the Self-Efficacy Towards Teaching Inventory (SETTI) for new nurse educators in the USA. This tool was adapted for nursing from a 35-item tool developed by Tollerud (1990) used to assess self-efficacy of teaching abilities among graduates and doctoral students enrolled in counsellor degree programmes. Reliability of the SETTI 48-item Likert type scale was established at 0.95 alpha coefficient with subscales ranging from 0.88 to 0.91 for 'course preparation, instructor behavior, examination and evaluation, and clinical skills' (Nugent et al. 1999, p. 233). Findings in Nugent et al.'s (1999) study indicated nurse educators who had specialized education courses and teaching experience had a stronger perception of self-efficacy regarding the teaching of nursing.

Crocetti (2014) also used Nugent et al.'s (1999) SETTI in a study to test self-efficacy before and after an orientation programme for new nurse educators. The orientation was designed to improve new nurse educator confidence in teaching skills needed for maternity care using simulation with nursing students. Results of this study supported the use of simulation as a strategy to increase self-efficacy in teaching for newly hired nurse educators as an alternative to other orientation methods such as self-paced learning modules, or policy and procedure review (Crocetti 2014).

Simulation as a teaching and learning method

The International Nursing Association for Clinical Simulation and Learning (INACSL) has published standards of best practices in simulation and recently updated their standards in 2016 (INACSL 2016a). These standards provide the nursing profession with best practice criteria for simulation design, outcomes and objectives, facilitation, debriefing, participant evaluation, professional integrity and interprofessional education. However, for nursing faculty in India to be successful in integrating new teaching methods, such as simulation, they need to be confident in their ability to implement these new strategies.

Findings from a recent qualitative study suggest faculty associate self-efficacy in teaching simulation with clinical competence and credibility (Livesay et al. 2015). In a randomized control trial in Iraq, Valizadeh et al. (2013) ascertained simulation improved self-efficacy among nursing students who used simulation to learn peripheral venous catheterization in children. Jetha et al. (2016) suggested for effective clinical teaching to occur, a strong foundation in knowledge and relational skills is needed and can be achieved through professional development programmes. However, a gap in the research exists on how learning simulation teaching methods impacts nurse faculty, particularly in low- and middle-income countries (LMICs) where simulation is emerging. Research on the impact of simulation education as a teaching method among nurse faculty in LMICs is needed using valid and reliable tools for measurement that are suitable for an international audience.

Aim

The overarching objective of this study was to assess the impact of a simulation workshop on self-efficacy in teaching for nurse educators in India. Specifically, the aim was to determine whether the simulation workshop had an effect on overall teacher self-efficacy including self-efficacy in 'course preparation, instructor behavior and delivery, evaluation and examination, and clinical practice' (Nugent et al. 1999, p. 233) and to investigate relationships between faculty sociodemographics and degree of self-efficacy in teaching. Additionally, we sought to revise and update the SETTI, shifting

the focus from a tool used for new nurse educators in the USA to focus on nurse educators globally, and test the reliability and validity of the revised tool.

Methods

Design, sample, setting

A quantitative pre–post survey design was used to assess the impact of the simulation education workshop on teaching self-efficacy among nurse faculty in India. A power analysis was conducted using SAS© version 9.4 (SAS Institute Inc. Cary, NC, USA). To detect a difference of 10% self-efficacy score increase (SD 25), a sample size of 55 was needed for 90% power. Flyers advertising recruitment for the study and simulation workshop were sent to 20 nursing schools across Karnataka, India. This study took place in a nursing school in Bengaluru, the 3rd largest city in India. One hundred and four registered nurses attended the 8-h faculty development workshop on simulation in March of 2017 and $N = 87$ met inclusion criteria for the study. Inclusion criteria were (1) >18 years old, (2) proficient in English (the primary language for nursing education delivery in India), and (3) employed as a nurse educator in a General Nurse Midwifery, Bachelor of Science in Nursing Program (BSN), or graduate nursing programme. About 89.7% participants were female. About 9.2% were age 25 years or below, 60.9% were between 26–35, 21.9% were between 46 and 45, 4.6% were between 46 and 55, and 3.4% were 61 or above. Highest degree among participants was reported as 23% BSN, 74.7% Master's of Science in Nursing and 2.3% PhD in Nursing. Years of nursing education experience among nurse educator participants were 16.1% <1 year, 13.8% 2–3 years, 16.1% 4–5 years, 26.4% 6–10 years, 16.1% 11–15 years, 8.0% 16–20 years, 2.3% 21–25 years and 1.1% 31–35 years.

Human participant protection

Prior to beginning the simulation education workshop intervention, informed consent was obtained from each participant. This study received exempt status from an Institutional Review Board (IRB) in the US ref#819430 and was approved by a hospital IRB in India.

Instrument revision, validation, and reliability measures

The study included instrument revision of the SETTI. Revisions included an update in terminology to reflect current teaching practice for all nurse educators globally (as opposed to new nurse educators in the United States). The revised tool was subsequently renamed the Self-Efficacy Towards Teaching Inventory for Nurse Educators (SETTI-NE). Permission from original authors was obtained to modify, rename and republish this tool (included in the Appendix S1 section). A comparison of the SETTI and SETTI-NE is delineated in Table 1.

In the instrument revision phase, researchers first revised the existing demographic section and clinical practice subscale in addition to a general update in terminology throughout the instrument. In the demographic section, revisions were made related to faculty rank, highest degree held and professional development in nursing education to reflect contemporary educational practices and an international audience. In the clinical practice subscale of the SETTI, which had no specific items on simulation, items related to simulation based upon the INACSL Standards of Best Practice: Simulation were developed for the SETTI-NE (INACSL 2016a,b,c,d, e,f). In the content validation phase, a content validity inventory (CVI) was first conducted. As it is recommended to have 5 or more experts when determining item CVI (Polit & Beck 2017), the revised SETTI-NE was reviewed by nine international expert nurse educators from the US ($n = 4$), India ($n = 2$), Iraq ($n = 1$), Malaysia ($n = 1$) and Sweden ($n = 1$). The experts rated the content of the revised SETTI-NE on a four-point Likert-type scale (1 = not relevant, 2 = somewhat relevant, 3 = quite relevant, 4 = highly relevant) and had the option to provide written feedback (Waltz et al. 2010). Both the item CVI and the scale CVI were calculated. An item CVI of 0.78 or higher and a scale CVI of 0.80 or greater was considered acceptable (Lynn 1986). The demographic section and SETTI-NE were scored separately.

Internal consistency and reliability of the SETTI-NE was described using correlation analysis, specifically evaluating the Cronbach's alpha on the pretest data ($N = 87$) obtained before the faculty simulation education intervention. Additionally, principal component analysis (PCA) was conducted to replicate methods used in the original tool (Nugent et al. 1999).

The simulation education intervention

An 8-h faculty development workshop on simulation was held in Bengaluru, India. The workshop included didactic, demonstration and hands-on simulation training using low to high fidelity simulation equipment and task trainers as described in Table 2. Didactic education was conducted in one assembly, and participants were divided into four groups for the simulation sessions which were offered concurrently four times to allow for each participant to attend each session.

The workshop was facilitated by one nursing faculty from the USA and 12 nursing faculty from one nursing school in India who were all experienced in teaching simulation

Table 1 Tool modification

	Self-Efficacy Towards Teaching Inventory (SETTI, 1999)	*Self-Efficacy Towards Teaching Inventory for Nurse Educators (SETTI-NE, 2017)*
1	'state goals and objectives clearly for class'	State goals and objectives clearly
2	'plan lectures'	Plan teaching methodologies
3	'write a course syllabus'	Write a course syllabus
4	'plan discussions'	Plan discussions (in class or online)
5	'plan class exercises'	Plan teaching and learning activities
6	'select textbooks for the class'	Select resources to support student learning
7	'select readings for the class'	Select relevant readings
8	'develop student assignments'	Develop student assignments
9	'state class grading criteria'	State grading criteria
10	'deliver lectures'	Deliver teaching methodologies
11	'select and use a variety of teaching strategies'	Select and use a variety of teaching strategies
12	'initiate class discussion'	Initiate discussion with students (in class or online)
13	'draw students into discussions'	Draw students into discussions (in class or online)
14	'communicate at a level that matches student's ability to comprehend'	Communicate at a level that matches student's ability to comprehend
15	'ask open, stimulating questions'	Ask open-ended, stimulating questions
16	'recognize and respect individual differences'	Recognize and respect individual differences
17	'manage student disagreements with instructor'	Manage student disagreements with instructor
18	'communicate consistently both verbally and non-verbally'	Communicate consistently both verbally and non-verbally
19	'show respect for student ideas and abilities'	Show respect for student ideas and abilities
20	'respond appropriately to students' questions'	Respond appropriately to students' questions
21	'respond to student emotional reactions in class'	Respond to student emotional reactions in class
22	'integrate readings and lectures'	Integrate readings and teaching methodologies
23	'construct essay questions that require integration of content, critical thinking and self-expression'	Construct examination questions that require integration of content, critical thinking and self-expression
24	'construct test questions measuring knowledge at different levels of cognitive domain'	Construct test questions that are at cognitive domain of apply or higher (apply, analyze, evaluate, create)
25	'develop a test blueprint'	Develop a test plan
26	'score and interpret examinations'	Score examinations and interpret results
27	'evaluate student assignments'	Evaluate student assignments
28	'utilize examinations as learning tools'	Utilize examinations as learning tools
29	'provide constructive feedback on examinations and assignments'	Provide constructive feedback on examinations and assignments
30	'develop teaching strategies that promote critical thinking'	Develop teaching strategies that promote critical thinking
31	'set clinical expectations that are appropriate for the level of the learner, given the learner's academic and clinical background'	Set clinical practice expectations that are appropriate for the level of the learner in patient care areas
32	'modify clinical strategies based on learner's level of performance'	Modify clinical teaching strategies based on learner's level of performance
33	'ask questions in a clinical setting that stimulate problem-solving'	Ask questions in a clinical practice setting that stimulate problem-solving
34	'provide constructive feedback in a supportive manner concerning clinical performance'	Provide constructive feedback in a supportive manner regarding clinical practice performance
35	'demonstrate confidence in the student'	Demonstrate confidence in the student
36	'assist student in new patient care situations'	Assist student in new patient care situations

Table 1 *Continued*

	Self-Efficacy Towards Teaching Inventory (SETTI, 1999)		*Self-Efficacy Towards Teaching Inventory for Nurse Educators (SETTI-NE, 2017)*
37	'stimulate the student to want to learn professional behaviour and competence'	37	Stimulate the student's interest to learn professional behaviour and competence
38	'adjust clinical assignments to individual's level of performance and confidence'	38	Adjust clinical practice assignments to individual's level of performance and confidence
39	'use evaluation criteria to determine student's clinical performance'	39	Use evaluation criteria to appraise student's clinical practice performance
40	'record and use anecdotal observations as part of clinical evaluation'	40	Record and use anecdotal observations as part of clinical practice evaluation
41	'identify a student having academic/clinical difficulty'	41	Identify a student having academic/clinical practice difficulty
42	'director advise students who are experiencing academic/clinical difficulty'	42	Director advise students who are experiencing academic/clinical practice difficulty
43	'conclude a student's clinical performance is failing'	43	Conclude a student's clinical practice performance is failing
44	'confront a student with a failing course or clinical grade'	44	Integrate best practices into simulation-based experience
45	'utilize self-evaluation in teaching'	45	Develop expected outcomes for simulation-based experiences
46	'arrange for constructive feedback and suggestions from peers'	46	Modify simulation facilitation to student's level of experience and competence
47	'use evaluations from students to improve teaching'	47	Use debriefing after a simulation-based experience to encourage learning
48	'evaluate the outcomes of a course'	48	Use simulation expected outcomes as basis for student evaluation
		49	Provide a supportive learning environment for the simulation-based experience
		50	Initiate discussion with a student with a failing grade
		51	Utilize self-evaluation to improve teaching
		52	Arrange for constructive feedback and suggestions from peers
		53	Use feedback from students to improve teaching
		54	Evaluate the expected outcomes of a course

education. To ensure consistency in teaching, the same faculty taught the same content in all sessions of the faculty development simulation workshop. The USA and Indian faculty conducting the workshop have a 5-year history of collaboration in building nurse capacity in India including garnering resources to promote simulation in India. This collaboration recently resulted in an award by the USA Agency for International Development (USAID) American Schools and Hospitals Abroad to build a Simulation Education and Research Centre in Bengaluru, India (USAID 2015).

Data collection and analysis

The SETTI-NE was administered via paper/pencil survey to workshop participants ($N = 87$) before and immediately after the workshop. Each participant was assigned a personal identification number which was placed on their pre- and post-survey. Pre- and post-survey data were entered into SAS© version 9.4 for analysis. Descriptive statistics were used to analyse the sample participant characteristics. Tests of normality were run using the Shapiro–Wilk test, and then, five paired sample *t*-tests were conducted to compare the differences in SETTI-NE total and subscale scores before and after the simulation workshop. To investigate level of confidence of nurse faculty before and after the simulation workshop intervention, per cent change (new score minus original score) was calculated for each participant, and then, average increase was evaluated. Additionally, relationships were assessed between demographic variables (degree, age category, and years of clinical experience) and per cent change in total pre- and post-test SETTI-NE scores. *P* Values were determined using Kruskal–Wallis test for continuous variables.

Table 2 Simulation education workshop intervention for nursing faculty

Workshop session topics	*Objectives*	*Teaching strategies*	*Time allotted*
Best practices in Simulation Standards (INACSL Standards Committee 2016a,b,c,d,e,f)	Participants will synthesize best practices in simulation according to INACSL standards	PowerPoint Presentation, Group Discussion	60 min
Use of simulation in a variety of settings	Participants will compare settings for simulation use in the simulation lab, classroom, hospital and community settings	PowerPoint Presentation, Video Presentation, Group Discussion	30 min
Promoting interprofessional collaborative practice with simulation	Participants will analyse methods for promoting interprofessional collaborative practice within simulation scenarios	PowerPoint Presentation, Video Presentation, Group Discussion	15 min
Simulation use in low resource settings	Participants will evaluate strategies for using simulation in low resource settings	PowerPoint Presentation Group Discussion	15 min
Paediatric simulation on fluid and electrolyte imbalance in a hospital setting (Elsevier Inc., 2014)	Participants will evaluate simulation as a teaching strategy for: • Assessment of a patient with dehydration. • Prioritization of patient safety measures and appropriate nursing interventions for a patient with dehydration. • Communication with patient and family. • Education of the patient and family regarding signs and symptoms of dehydration and treatment plan.	Paediatric Simulation Demonstration with faculty and students, Hands on Practice with Participants, Q&A	90 min
Nursing and midwifery care during second stage of labour and delivery in a hospital setting (The Royal College of Midwives, 2012)	Participants will evaluate simulation as a teaching strategy for: • Recognition of the signs and symptoms of PPH and its effective management. • Management the mother with normal and abnormal labour.	OB Simulation Demonstration with faculty and students, Hands on Practice with Participants, Q&A	90 min
Helping Babies Breathe in a rural healthcare setting (American Association of Pediatrics, 2017)	Participants will evaluate simulation as a teaching strategy for: • Demonstration of skills to help neonates breathe within 1 min of delivery.	Neonatal/Newborn Simulation Demonstration, Hands on Practice with Participants, Q&A	90 min
Employing cardiopulmonary resuscitation and use of an automatic external defibrillator in a community setting (American Heart Association, 2016)	Participants will evaluate simulation as a teaching strategy for: • Sequence of actions and skills required for cardiopulmonary resuscitation. • Use automatic external defibrillator during the simulated resuscitation of a victim with cardiac arrest.	Code Simulation Demonstration, Hands on Practice with Participants, Q&A	90 min

Results

Instrument validity

For the nine items in the demographic section, one item (item CVI 0.75) was below the 0.78 benchmark for item CVI and the scale CVI was 0.89 exceeding the 0.80 benchmark. For the 54-items of the SETTI-NE, two items (item CVIs of 0.77 and 0.66) were below the 0.78 benchmark for item CVI and the scale CVI was 0.96 exceeding the 0.80 benchmark. Benchmarks were set according to recommendations by Lynn 1986. Following data analysis, revisions were made by the researchers to items on the demographic section and SETTI-NE based upon the written feedback from the expert nurse educators and the three items that did not meet the item CVI benchmark of 0.78.

Instrument reliability

The overall raw Cronbach's alpha ($r = 0.98$) was greater than the Nunnally (1978) standard of 0.70, and all deleted variables' alpha values were greater than 0.70 suggesting that the set of SETTI-NE variables in this data set ($N = 87$) show good internal consistency and reliability (Nunnally 1978).

Principal component analysis of the SETTI-NE revealed eight factors extracted with eigenvalues greater than one. Data were evaluated as un-rotated and orthogonally rotated. These results were consistent with Nugent et al. (1999) primary analysis which also identified eight factors with eigenvalues greater than one. Consistent with Nugent et al.'s (1999) results, Factor 1 and Factor 2 accounted for a majority of the variance in the model (55% and 5%, respectively). The majority of the variance for all six new simulation questions added to the modified scale (items 44–49) was accounted for by Factor 2.

Simulation intervention impact on faculty perceived self-efficacy

Mean pre- and post-SETTI-NE survey scores are reported in Table 3. There were significant improvements in total self-efficacy and subscale scores among nurse educators after the simulation workshop intervention when compared to pre-survey results: Total SETTI-NE $t(86) = -10.36$, $P < 0.0001$; Course Preparation $t(86) = -10.03$, $P < 0.0001$; Instructor Delivery $t(86) = -8.96$, $P < 0.0001$; Evaluation and Examination $t(86) = -7.47$, $P < 0.0001$; and Clinical Practice $t(86) = -10.77$, $P < 0.0001$.

Relationships between sociodemographic variables and faculty perceived self-efficacy

No significant relationships were found between the average per cent increase in total SETTI-NE score and faculty level of education ($P = 0.29$), age group ($P = 0.35$) and years of clinical experience ($P = 0.14$).

Discussion

Limitations

The authors acknowledge several limitations to the study. The SETTI-NE pre- and post-surveys were delivered in English, a secondary language for the participants. Whereas participants were fluent in English and it is the primary language for the delivery of nursing instruction in India, English as a secondary language could influence their understanding of the survey questions. This is also the first time that the SETTI-NE was used internationally. Additionally, sampling methods used limited geographical location of participants to one state in South India. Ideally, the simulation workshop would have been longer in length; however, feedback from potential participants indicated it was difficult to take time from educational settings for more than 1 day and they would not have received support from their institutions for a multiday conference. Reliability would be strengthened if the study included multiple simulation sessions over a longer span of time. The timing of the post-survey, immediately after the workshop, is another limitation, as ideally the post-survey would have been completed by the study participants at a longer timeframe from the workshop. Given the constraints of the study location it was deemed best to give the post-survey immediately in order to receive as many as possible. Additionally, a larger sample size may have influenced the PCA, delineating fewer factors. Finally, the practice of *Izzat*, a Hindi term used to describe the tradition of saving honour, is embedded in Indian culture (Baig et al. 2014) and may have

Table 3 SETTI-NE pre survey and post survey results

Variable	*Mean ± SD*	*Median (IQR)*	*Minimum*	*Maximum*
Total Pre-Course Score	175 ± 29	178 (154–201)	90	216
Total Post-Course Score	200 ± 19	209 (186–216)	148	216
Total Score Per cent Change	17 ± 20	12 (3–23)	−5	131
Clinical Practice Pre-Course Score	50 ± 10	51 (43–58)	20	64
Clinical Practice Post-Course Score	59 ± 6	62 (55–64)	39	64
Clinical Practice Per cent Change	22 ± 24	15 (4–33)	−11	130
Course Preparation Pre-Course Score	32 ± 6	33 (28–37)	15	40
Course Preparation Post-Course Score	37 ± 4	39 (34–40)	26	40
Course Preparation Per cent Change	18 ± 23	14 (3–24)	−9	153
Evaluation and Examination Pre-Course Score	46 ± 8	47 (42–53)	20	56
Evaluation and Examination Post-Course Score	52 ± 5	55 (49–56)	39	56
Evaluation and Examination Per cent Change	16 ± 25	9 (0–22)	−17	170
Instructor Delivery Pre-Course Score	46 ± 7	47 (41–53)	27	56
Instructor Delivery Post-Course Score	52 ± 5	55 (48–56)	41	56
Instructor Delivery Per cent Change	14 ± 17	10 (2–24)	−13	93

influenced self-efficacy scores, making self-efficacy among nurses in India difficult to compare to similar research conducted in other nations.

Conclusions

The primary aim of this study was to assess the impact of simulation education on self-efficacy in teaching for nurse educators in India. A secondary aim was to revise and update a tool to measure self-efficacy in teaching, shifting the focus from a tool used for new nurse educators in the USA to focus on nurse educators globally, and to test the reliability and validity of the revised tool. As expected, the highest improvement in mean scores rating self-efficacy among faculty after the simulation workshop occurred in the clinical practice subscale where six new simulation questions were added; however, findings also indicated the intervention positively influenced other aspects of teaching self-efficacy including course preparation, instructor behaviour and delivery, and evaluation and examination. This raises the question, does introducing simulation as a teaching strategy stimulate more creative ideas for nurse educators to use when teaching students? Does the inherent nature of simulation as a teaching strategy stimulate imaginative course planning ideas? Does the practice of evaluating students in simulation improve overall teacher self-efficacy in evaluation and examination? For example, one topic presented at the workshop included an overview of how simulation can be infused into didactic settings such as the traditional classroom which may have influenced overall teacher self-efficacy in course preparation. Each simulation scenario breakout session placed an emphasis on reflective learning through debriefing which could influence overall teacher self-efficacy instructor behaviour, delivery and evaluation.

These findings support the need for continuing education in simulation as an educational modality in India and have application for other limited resource settings. The INACSL (2016a,b,c,d,e,f) standards for best practices in simulation were effectively used in the simulation education intervention for this study and included core components applicable to all subscales measured in the SETTI-NE. This model for simulation education could be used to strengthen nursing curricula in other international settings, particularly those where simulation is a new or emerging teaching and learning strategy.

Implications for nursing practice

Self-efficacy in course preparation

Course preparation by nursing faculty is essential for effective teaching to occur and includes planning to provide opportunities for students to improve clinical decision making and critical thinking skills (National League for Nursing 2017). INACSL (2016b) standards for best practices in simulation emphasized the importance of developing outcomes and objectives for sound instructional design. Participants in this study showed improvement in course planning after a simulation workshop. Examples of self-efficacy in specific course planning activities measured in this study included identifying goals and objectives clearly in addition to selecting resources to support student learning. The INACSL (2016b) also highlights the need for clear identification of the targeted learning domain as a required element of constructing objectives. Improving teacher self-efficacy in writing objectives for simulation may also improve overall teacher self-efficacy in writing course, clinical and laboratory course objectives.

Self-efficacy in instructor behaviour and delivery

INACSL (2016c) best practices in simulation facilitation highlight the importance of the instructor as facilitator as one who 'assumes responsibility and oversight for managing the entire simulation-based experience' (p. S16). The SETTI-NE measures self-efficacy in instructor delivery by assessing confidence in delivery and integration of teaching methodologies and strategies. Instructor delivery on the SETTI-NE is also measured by assessing teacher confidence in asking open-ended questions, and initiating and managing discussions with students. These are also core concepts needed for effective debriefing in simulation and are embedded in the INACSL (2016d) best practices in debriefing. The purpose of planned debriefing after nursing simulation is to improve future performance and should be facilitated in a manner that promotes open communication (INACSL 2016d). A focus on debriefing in the simulation workshop outbreak sessions may have influenced overall teacher self-efficacy in communicating with students, even outside of the simulation setting.

Self-efficacy in evaluation and examination

Evaluation is a complex component of the nurse educator's role (Hagell et al. 2016). Garner et al. (2017) reported nurse faculty new to simulation in India had poor inter-rater reliability when evaluating students participating in simulation; however, inter-rater reliability improved with practice and continuing education in evaluation (Killingsworth et al. 2017). Findings in the current study indicated faculty development in simulation improved self-efficacy in evaluation and examination. INACSL (2016e) standards of evaluation that were presented at the conference highlighted the importance of evaluation of simulation participant cognitive, affective and psychomotor skills in the simulation process and

warned that consequences of not following evaluation standards could lead to ineffective learning and poor participant experiences.

Self-efficacy in clinical practice

Learning about simulation as a teaching strategy raises faculty awareness about instructional possibilities that are more challenging for students and may impact teacher self-efficacy in clinical practice. Some conditions or clinical emergencies are rare and might not be seen or experienced in the clinical setting by every student during their clinical rotations; however, it is important for teachers to promote sound clinical decision making skills related to these conditions within the students. Introducing simulation as a strategy to teach these conditions in the post-conference setting to may have increased overall teacher self-efficacy in clinical practice. The authors agreed clinical practice was the appropriate section of the SETTI-NE to add the simulation questions because a landmark study by the National Council of State Board of Nurses provided 'substantial evidence that substituting high-quality simulation experiences for up to half of traditional clinical hours produces comparable end-of-programme educational outcomes and new graduates that are ready for clinical practice' (Hayden et al. 2014, p. S3).

Implications nursing education and nursing policy

Nursing faculty preparation is a key requisite to strengthening nursing education and nurse capacity globally (Spies et al. 2017). In its National Health Policy, the Ministry of Health (2017) acknowledges how nurses are integral to improving health outcomes in India and calls for centres of nursing excellence in all of its member states to address the quality of nursing education in India. The use of simulation in nursing is a new teaching and learning method in India, and it is imperative nurses employing simulation feel confident employing international standards for best practices as centres for nursing excellence emerge (Garner et al. 2017). These findings can be used as models for simulation education are developed in other international settings, and the SETTI-NE can serve as a contemporary survey to measure self-efficacy among nurse faculty in future research.

Additionally, an updated tool to measure self-efficacy towards teaching for nurse educators was revised and found reliable and valid for international use. Results from the internationally validated SETTI-NE indicated the workshop was effective in significantly improving self-efficacy towards teaching for nurse educators and included significant improvement in self-efficacy in the areas of course preparation, instructor delivery, evaluation and examination, and clinical practice. While self-efficacy in teaching simulation was assessed in the clinical practice subscale of the SETTI-NE, improvements in all areas suggest faculty development education in simulation may improve overall teacher self-efficacy. Future studies are needed to determine how simulation education can influence teacher self-efficacy and which attributes of simulation education have an impact on self-efficacy on other aspects of teaching.

Acknowledgements

The authors gratefully acknowledge Ms. Ramya, MSN, Ms. Flary, BSN, Mr. Daniel, MSN, Ms. Jagadeeswari, MSN, Ms. Nethra, BSN, Ms. Sivanthiya, BSN and Ms. Regina, BSN for the role they played in implementing the simulation workshop intervention.

Author contributions

Study design: SLG, EK, MB, LR
Data collection: SLG, EK, LR, SRJ, ASP, PS, SV
Data analysis: SLG, EK
Study supervision: SLG, LR
Manuscript writing and critical revisions for important intellectual content: SLG, EK, MB, LR, SRJ, ASP, PS, SV

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Supporting information

Additional Supporting Information may be found in the online version of this article:

Appendix S1 Self-Efficacy Towards Teaching Inventory for Nurse Educators (SETTI-NE).