



Psychometric testing of the Norwegian version of the questionnaire, Student Satisfaction and Self-Confidence in Learning, used in simulation



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ABSTRACT

Simulation is increasingly being used as an approach to learning in nurse education. There is a need for frameworks and valid evaluation tools to help guide educators in implementing the method. The questionnaire, *Student Satisfaction and Self-Confidence in Learning*, which consists of two subscales, has been developed by the National League for Nursing in the US for evaluating simulation used in nurse education.

The aim of the present study was to test the questionnaire, *Student Satisfaction and Self-Confidence in Learning*, for psychometric properties in a Norwegian nurse education context.

A sample consisting of 130 nursing students participated in a simulation situation, and 123 responded. When the questionnaire was tested in its entirety, psychometric testing conducted with a principal component analysis did not reveal a stable factor solution. The two subscales were then tested separately. The analysis for *Satisfaction with Current Learning* suggested a one-component solution, thereby explaining 62.8% of the variance, and the internal reliability was 0.84. With regard to *Self-Confidence in Learning*, no stable solution was achieved, and an alpha value of 0.64 was shown.

To further validate the questionnaire, *Student Satisfaction and Self-Confidence in Learning*, more studies by various nursing programmes in different cultural contexts are recommended.

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Background

In practice-based healthcare education it is essential to focus on facilitating the students to apply classroom learning in a clinical context (Benner, 2010; Kardong-Edgren et al., 2012; Sherwood, 2012). This has caused an increased and widespread use of human patient simulation (HPS) as a pedagogical approach to learning in nurse education (Cant and Cooper, 2010; LaFond and Van Hulle Vincent, 2012), which is also recommended by the World Health Organization to enhance patient safety (WHO, 2011). Innovations in advanced technology and arranged environment offer new options

for reproducing clinical problems and realistic holistic patient situations close to clinical practice. The students are given opportunities to experience and practise nursing that includes the affective, cognitive, and psychomotor domains in a safe learning context (Cant and Cooper, 2010; Jeffries and Norton, 2005). To help achieve learning from HPS, it is important that the students have achieved simulation competency (Dieckmann, 2009), a willingness to engage in simulation scenarios, to be prepared for the topic being played out, to understand the basic principles of simulation, and how to interpret what they encounter during the situation. Prior to the scenario being played out, the students undergo a briefing to ensure that they are familiar with the equipment and technology involved, as well as with the opportunities and limitations presented in the situation. In addition, the students should undergo a debriefing that is considered to be a crucial phase for learning through simulation (Dreifuerst, 2009; Levett-Jones and Lapkin, 2014).

The widespread use of HPS has generated a need for frameworks and reliable and valid evaluation tools to guide educators in designing, implementing, developing and evaluating the HPS as a

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learning approach (Jeffries, 2005; Kardong-Edgren et al., 2010; LaFond and Van Hulle Vincent, 2012). Such tools provide the possibility to compare the results across different studies, both nationally and internationally, with validated instruments increasing the certainty of the results by accurately reflecting what they are supposed to measure (Gjersing et al., 2010). There is a need to confirm and test such questionnaires and their relevance to nursing programmes in different countries (LaFond and Van Hulle Vincent, 2012). Questionnaires which collect data that reflect self-perception and student satisfaction could have uncertainties concerning learning outcomes (Davis et al., 2006), but nevertheless they represent a major contribution for developing and enhancing simulation as a learning method (Jeffries and Rogers, 2007b; Morrisette and Gadbois, 2006).

Frequently used in nurse education is the theoretical framework for simulation *National League for Nursing/Jeffries Simulation Framework (NLN/JSF)*, developed in the United States (US) (Kardong-Edgren et al., 2010), which was previously named the *Nursing Education Simulation Framework* (Jeffries, 2005; Jeffries and Rogers, 2007b). The basics of this approach are the declaration that learning outcomes are influenced by the teacher (facilitator), student, educational practices, and simulation design characteristics. Theoretically based on NLN/JSF, three questionnaires were further developed by the National League for Nursing (NLN) (Jeffries and Rizzolo, 2007; Kardong-Edgren et al., 2010), which was named the *Student Satisfaction and Self-Confidence in Learning (SSS)*, the *Educational Practices Questionnaire (EPSS)*, and the *Simulation Design Scale (SDS)*. They were all developed for designing, implementing and evaluating simulation (high- or low-fidelity) as a teaching strategy in nursing (Jeffries, 2005; Jeffries and Rogers, 2007a).

In the present study, the questionnaire *Student Satisfaction and Self-Confidence in Learning (SSS)* was considered to be highly appropriate for psychometric testing. The questionnaire consists of two dimensions with a number of items above the limit considered to be appropriate for factor analysis (Costello and Osborne, 2005; Tabachnick and Fidell, 2013). The two dimensions are: *Satisfaction with Current Learning*, with five items related to simulation activity, and *Self-Confidence in Learning*, with eight items measuring how confident students felt about the skills they practised and their knowledge about caring for the patient presented in the simulation. The response scale uses a five-point Likert-type rating scale (1 = strongly disagree with the statement, 5 = strongly agree with the statement). Content validity was established by nine clinical experts in nursing (Jeffries and Rizzolo, 2007). Reliability was tested using a Cronbach's alpha with the result for *Satisfaction with Current Learning* at 0.94 and *Self-Confidence in Learning* at 0.87 (Jeffries and Rizzolo, 2007). It appears that the two dimensions were initially constituted as two separate scales, but were subsequently united into a two-dimension scale (Jeffries and Rizzolo, 2007). The NLN/JSF framework and the questionnaire have been used in several studies, and internal reliability through the use of a Cronbach's alpha has been reported and confirmed as in the original at >0.85 (Butler et al., 2009; Cantrell et al., 2008; Kardong-Edgren et al., 2010; Reese et al., 2010; Sittner et al., 2009). Moreover, no published psychometric test of the questionnaire has been found.

There is a need for studies outside the US to confirm and test the questionnaires, as well as the relevance to nursing programmes in other countries (LaFond and Van Hulle Vincent, 2012). The use of questionnaires across national boundaries and cultural conditions presents challenges in developing both culturally and linguistically equivalent questionnaires. As part of this process, psychometric testing of the translated scales is required to draw conclusions about the conceptual and semantic equivalence to the original (Polit and Beck, 2008). Factor analysis is an approach to construct

the validation of instruments by identifying clusters of related variables that create dimensions underlying a central construct (Polit and Beck, 2008).

The aim of the present study was to test the questionnaire, *Student Satisfaction and Self-Confidence in Learning*, for psychometric properties in a Norwegian nurse education context.

Methods

The NLN gave permission to translate and use the questionnaire *Student Satisfaction and Self-Confidence in Learning*. The translation process followed the back-translation model inspired by Brislin (1970). Content validity was established by three persons with expertise in simulation and nurse education. A pilot study was conducted in a group of 14 students selected from an equal population to strengthen both the semantic and content equivalence (Polit and Beck, 2008). After participating in a simulation situation, they were asked to answer and comment on the statements and the form's layout. None of these students participated in the present study.

Sample and data collection

The study was conducted as a survey of bachelor nursing students in the second year of their three-year programme and the simulation was part of their usual study programme. The students ranged in age from 19 to 51 (median score 22). Due to the fact that few men participated, no data on gender was collected in order to ensure confidentiality. Prior to the present study, the students had participated in simulation as part of their study programme.

Information about the study was given by the researchers in writing one week in advance. The learning situation was conducted by the use of paper/pencil case study (LFS) and HPS, including four phases. In advance of the HPS the students worked with LFS focussing on a patient's need for adequate respiration and circulation. When entering the classroom for HPS, the students were divided into three groups, with each consisting of approximately 43 students. A briefing was conducted to make the participants familiar with and aware of the environments and equipment available. The implementation of the scenario was conducted using a human patient simulator. Two or three students performed the scenario action in a process-based role, while the others followed the scenario transferred to a large screen in a response-based role (Cioffi, 2001; Jeffries, 2005), in which they were given particular observation tasks for the scenario performed. The debriefing included students in both the process- and response-based roles, focussing on a reflection on the learning exercises and hypothesizing on how to perform differently (Jeffries and Rogers, 2007b). The same scenario was conducted in all three groups, with two teachers (an operator and a facilitator), both experts in the topic and simulation, conducting all three scenarios. None of the researchers took part in the implementation of the simulation. Data was collected by the use of the questionnaire, *Student Satisfaction and Self-Confidence in Learning*. Following the debriefing, one of the researchers (R.T.) entered to repeat, both orally and in writing, information about filling in the questionnaire. It was emphasised that filling in was voluntary and anonymous. Subsequent to this, the questionnaire was handed out ($n = 130$), and 123 students responded (94.6%).

Ethics

The implementation of the study was approved by the Norwegian Social Science Data Services (NSD), and permission was given from the university college. Ethical guidelines for nursing research

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