

## How Students Rate their Learning in Simulation

Nancy McNamara MHSc (hons), BN, RN, CATE

Centre for Health and Social Practice, Wintec, Hamilton, New Zealand;

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### Introduction

Simulation incorporating everything from case studies to high technology computer based programmes, is becoming an integral part of nursing education (Edgecombe et al., 2013). Such diversity in simulation modalities however has hindered its robust evaluation as a teaching strategy (Adamson & Kardong-Edgren, 2012). This has resulted in many small studies each advocating the benefits of student learning in different types of simulation. A vast number of evaluation tools have been used, each specifically designed to assess the ability of simulation to meet student learning objectives (Kardong-Edgren, Adamson, & Fitzgerald, 2010). Despite this, research outcomes globally concede that simulation in nursing education enhances student learning (Berndt, 2014; Dunnington, 2014; Handley & Dodge, 2013; McNamara, 2014, 2015; Shinnick, Woo, & Evangelista, 2012).

This article reports the development and results of a simulation programme adopted in order to prepare students for clinical practice. The programme was developed specifically for first year nursing students. It was designed to contextualise learning and reinforce and facilitate the integration of new skills and knowledge. Students in this programme completed a practice workshop followed by a simulated clinical duty. Students worked in groups of three rotating through the roles of patient, nurse and observer. Over a four day period, students admitted patients, planned and provided nursing care, collaborated with members of a multidisciplinary team and planned safe patient discharges.

Anecdotal evidence from students suggested that significant learning occurred over the four day period. In order to confirm and capture the nature of the learning, research was conducted over an 18 month period. Student participants completed questionnaires providing feedback about their learning experiences. In total 158 students provided feedback. Results showed that: practical skills, documentation, interdisciplinary collaboration, realism, patient experience, clinical judgement and therapeutic skills were areas in which their learning was enhanced (McNamara, 2014).

The overall aim of this study was to explore the role of simulation in nursing students' learning, specifically in the areas that students identified.

### Methodology

A prospective before and after design was adopted for this research. Ethical approval and consent was gained from appropriate Ethics Committee and potential participants, respectively, self-selecting students were asked to rate their: clinical skills and knowledge, understanding of the patient experience, therapeutic skills, clinical judgement, documentation and understanding of multidisciplinary team roles prior to and on commencement of the simulation programme.

**Sample:** All students who completed the programme within the semester were invited to take part in the study. 78 students consented to take part in the study. The sample's average age was 32 (range: 17-58).

## Data collection

A short, self-administered questionnaire was developed, using a scale of 0-10 (ten being the highest score), to rate students awareness of their own knowledge, ability and skills. This questionnaire was used, without alteration, throughout the study. Students were asked to rate their knowledge, ability and confidence before and after the commencement of the simulation programme using the same scales. The questions were as follows:

- Q1.** You were allocated a simulated patient and told why the patient was admitted to your ward. How much knowledge do you currently have about your patient's diagnosis / reason for admission?
- Q2.** How do you rate your understanding of the experience of being a patient and receiving nursing care?
- Q3.** How confident do you feel in your ability as a student nurse to form and maintain a therapeutic relationship with your patient?
- Q4.** During the programme you will be expected to provide some basic nursing care such as bed bathing and changing an occupied bed. How competent do you feel in providing this care for your patient?
- Q5.** In debriefing you are required to reflect on the decisions you made while caring for your patient.  
How confident do you feel in your ability to do this?
- Q6.** How would you rate your understanding of the roles of the members of the multidisciplinary team?
- Q7.** How confident do you feel making clinical decisions for your patient's care?
- Q8.** How confident do you feel completing professional documentation eg care plans, medication charts and clinical notes?

## Data Analysis

Student scores were recorded and analysed in three ways. All scores for responses 1-8, pre and post simulation were analysed using descriptive statistics. There were 17 cases with missing information. To gauge any statistical difference in individual's scores from before to after attending the simulation programme a paired t-test was used. For this analysis, the 17 cases with missing data were excluded. In order to utilise all cases an unpaired t-test was also applied. This analysis would simply provide statistical change in the average scores of the group before and after attending the simulation programme. In other words, the groups are assumed as independent.

## Results

Overall, the analyses show a statistically significant difference between students' pre and post scores for each of the eight questions (see tables: 1a, 1b and 1c). The results in Table 1b and 1c suggest that on average the simulation programme significantly improved students' learning. Confidence and clinical decision making were of particular importance in preparing student nurses for practice. This study provides evidence that students' confidence is significantly improved, in other words, the programme significantly improved students' ability to confidently make clinical decisions (Q3, Q7), completing professional documents (Q8), and maintain a therapeutic relationship with patients (Q3). Similarly, the programme appears to have significantly improved students' understanding of issues directly relevant to patient care such as reason for admission and diagnosis, patients' experience, and competencies in providing patient care

**Table 1a- Descriptive Statistics: scores for questions 1-8 before and after the simulation**

Question	Pre/Post	Number	Mean	Median	SE Mean
Q1.	Pre	78	3.53	3.0	0.25
	Post	61	7.03	7.0	0.20
Q2.	Pre	78	5.14	5.0	0.29
	Post	61	7.65	8.0	0.18
Q3.	Pre	78	5.17	5.0	0.25
	Post	61	7.57	8.0	0.17
Q4.	Pre	78	5.59	5.0	0.26
	Post	61	7.44	7.0	0.20
Q5.	Pre	78	4.73	5.0	0.26
	Post	61	6.95	7.0	0.20
Q6.	Pre	78	4.59	5.0	0.26
	Post	61	7.44	8.0	0.20
Q7.	Pre	78	4.30	5.0	0.21
	Post	61	6.83	7.0	0.20
Q8.	Pre	78	3.70	3.5	0.22
	Post	61	6.73	7.0	0.21

**Table 1b-Knowledge/skill differences/confidence before and after simulation - paired t-test**

Question	Mean Pre	Mean Post	SE Mean-Pre	SE Mean-Post	Difference Estimate	Confidence Interval	P-Value
Q1.	3.54	7.03	0.26	0.21	-3.49	(-4.15, -2.84)	0.00
Q2.	5.14	7.66	0.29	0.19	-2.51	(-3.19, -1.83)	0.00
Q3.	5.18	7.57	0.26	0.18	-2.39	(-3.01, -1.77)	0.00
Q4.	5.59	7.44	0.27	0.21	-1.85	(-2.51, -1.18)	0.00
Q5.	4.73	6.95	0.26	0.20	-2.22	(-2.87, -1.56)	0.15
Q6.	4.59	7.44	0.26	0.21	-2.85	(-3.51, -2.19)	0.00
Q7.	4.31	6.84	0.21	0.21	-2.52	(-3.11, -1.94)	0.00
Q8.	3.71	6.74	0.23	0.22	-3.03	(-3.65, -2.41)	0.00

**Table 1c-Unpaired t-Test (Pre=78, Post =61)**

Question	Mean Pre	Mean Post	Difference	SE Mean	Confidence Interval	P- Value
Q1.	3.50	7.03	-3.52	0.35	(-4.23, -2.81)	0.00
Q2.	5.04	7.65	-2.60	0.34	(-3.30, -1.91)	0.00
Q3.	5.19	7.57	-2.37	0.33	(-3.04, -1.70)	0.00
Q4.	5.41	7.44	-2.03	0.32	(-2.68, -1.38)	0.00
Q5.	4.62	6.95	-2.32	0.34	(-3.02, -1.63)	0.00
Q6.	4.34	7.44	-3.09	0.35	(-3.81, -2.38)	0.00
Q7.	4.23	6.83	-2.60	0.34	(-3.28, -1.92)	0.00
Q8.	3.59	6.73	-3.14	0.35	(-3.84, -2.44)	0.00

## Discussion

Results in this study indicate that the greatest difference in students' pre and post scores was in the areas of learning about their patient's diagnosis or reason for admission, increased confidence in completing professional documentation and understanding the roles of the multidisciplinary team. Previous studies also report an increase in clinical knowledge from simulated clinical practice (Alinier & Platt, 2014; Berndt, 2014; Glidewell & Conley, 2014). These areas incidentally also rated low in pre-test scores, and reflect students' lack of initial confidence and perceived knowledge. This is not surprising considering that the simulation programme was students' first introduction in many cases to professional clinical processes such as admission, discharge and inter-professional teams.

Conversely students perceived their competence in providing basic care for their patients, relatively high in the pre-test results. Anecdotal evidence throughout the programme provided some insight into the possible reason for this. Many of the students were employed or had been previously employed in residential care facilities or hospitals whereby basic patient care was part of their daily role. Several studies however raise concerns about undergraduate students ability to accurately self-assess skill competence and clinical reasoning, reporting slightly positive to strongly negative correlations between student and faculty assessments (Adair, Hughes, Davis, & Wolcott-Breci, 2014; Baxter & Norman, 2011; Jensen, 2013; Strickland, 2013). The difference in correlations may well be related to nurses' experience in self-assessment and their length of study (Strickland, 2013). Regardless of the level of students' perception of their knowledge and abilities, the fact that we observed large differences between pre- and post- scores suggest the possibility that a) students may have overestimated their knowledge before the programme, and, b) there was much to learn. While knowledge, clinical reasoning and competence may be dually assessed, students' depth of understanding of a personal experience cannot. In this study students self-perceived understanding of the patient experience, despite the high rated level of prior understanding, yielded the highest post-test score in overall results see tables: (1a,1b,1c). Other studies have reported similar findings (Comer, 2005; Patterson & Hulton, 2012; Waldo, Hermanns, & Lilly, 2013). Therefore, it is important to emphasise understanding of patient experience in any mode of nursing education.

## Research Limitations

The main aim of this study was to explore changes in perceived learning of nurse students following a simulated learning programme. The interest was whether, on average, students' perceived knowledge improved through simulated learning. Therefore, in this study we have not allowed for possible effects on learning from other confounding and explanatory variables such as age, gender, ethnicity, and previous clinical experience. Furthermore, the study excluded a comparison with conventional and alternative training modalities.

## Conclusion

The simulation programme on average, raise the knowledge/skill, understanding and confidence levels of first year student nurses. The results of this study provide some prima facie evidence to continue to develop the simulation programme and test its effects. Future research should include a larger sample and acknowledge students previous experience of caregiving.

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