Education through Simulation News

Simulation training technology in undergraduate nursing education

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The development of full-scale patient simulators started in the 1960s in the USA. Since then a number of studies have been carried out to determine if the use of such technology as a teaching tool is really beneficial and cost-effective. A recent study*, completed in 2003, published the effect of scenario-based simulation training on nursing students' clinical skills and competence, using 99 volunteer students in the second year of a Diploma in Higher Education in Adult Nursing. Approval was granted for this study by the Faculty of Health and Human Sciences Ethics Committee, the study was funded by a grant from the British Heart Foundation and access to the students was gained through cohort tutors.

The students were randomly allocated to either a control or an experimental group. The experimental group, as well as following their normal curriculum, took part in scenario-based hands-on training sessions in a simulated clinical intensive care setting over two afternoons. Students' clinical skills were assessed using pre and post tests, using questionnaires and a 15-station Objective Structured Clinical Examination (OSCE) - specifically designed to enable comparison between the control and the experimental group. Each station focuses on a particular clinical aspect, either in a practical way and invigilated by an examiner, or in a theoretical way, in the form of a pen and paper exercise.

OSCEs are recognised as a highly reliable and valid assessment method (Sloan et al. 1995). In this study, very detailed attention was paid to the design of the OSCE instructions and to the marking and answer sheets. A panel of educators was involved in the validation of the 15 stations for content and accuracy and data analysis was performed using SPSS version 11.0.

Students were given a limited time at each station and had to wait for a signal before rotating to the next one (Harden 1990) By the end of each OSCE, all students had passed through all the stations and had been marked according to a precise set of criteria. The OSCE stations and marking schemes remained identical throughout the project to enable comparison of the results. There was a 6-month separation between the pre and post experimental OSCEs, and for those in the experimental group the second OSCE was conducted at least 5 weeks after their simulation sessions. For the second OSCE, students were given feedback after the assessment period for each practical station, enabling both data collection and feedback at each station. The hypothesis being tested was that the experimental group, having had access to hands-on simulation training, would perform better in the test than the control group.

The results were based on the 50 students in the control group and 49 in the experimental group who completed the study by attending all the required sessions. Analysis of the first OSCE performance of students showed that the average OSCE score of the control group was comparable to the score of the experimental group. A comparison of the results of the two groups for the post OSCE indicates that students in the experimental group generally obtained higher marks than those in the control group ($P<0.01$).

It is very difficult to conduct a valid study evaluating the impact on clinical practice of rapidly changing technology such as simulators (Kneebone 2003). Despite the constraints of our study and the somewhat small sample of students, the results support those of other studies (Abrahamson et al 1969, Gordon et al. 1980, Chopra et al. 1994) and provide quantitative evidence of a positive impact of simulation training.

Our results support the use of simulation in nursing education. It is however, important

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to recognise that it can only be-beneficial to students if it is used appropriattely and in a way that improves the quality of teaching and learning. New training tools require new ways of teaching, and this is particularly true with the newer patient simulators as they offer greater realistic interactivity between facilitators and trainees. This means that facilitators can, and probably should, have les interaction with students during scenarios. Students themselves should play the major role during the session, as they should be the ones "in control" of the situation. This allows them to learn from mistakes and act on their own judgement. Both the practice of basic skills and the experience of scenario-based training are forms of practice and it is recognised that practice makes perfect.

The conclusion made was that intermediate-fidelity simulation is a useful training technique. The use of simulation technology has great potential in continuing professional education and lifelong learning (Issenberg et al. 1999). It enables small groups of students to practise in a safe and controlled environment how to react adequately in a critical patient care situation. This type of training is very valuable to equip students with a minimum of technical and non-technical skills before they use them in practice sessions.

* Alinier G et al. 2006. Journal of Advanced Nursing. Effectiveness of intermediate-fidelity simulation training technology in undergraduate nursing education. 54(3), 359–369

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