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Can the use of simulation support pre-registration nursing students in familiarising themselves with clinical skills before consolidating them in practice?

Final Report

Conducted for the Nursing and Midwifery Council

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Conducted for the Nursing and Midwifery Council

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Executive summary

1. The project was completed between September and December 2006, led by UWE in collaboration with the Bristol Medical Simulation Centre. It was commissioned by the Nursing and Midwifery Council as one of thirteen pilot sites. We explored the use of simulation support for pre-registration children's and adult nursing students in familiarizing themselves with clinical skills before consolidating them in practice. We also interviewed six nurse mentors about the use of simulation in preparation for practice.

2. Students from years one and three of the curriculum were involved following randomization into either control or simulation groups. A total of 69 students were involved in the simulation group and with the control group involving 13 students in objective structured clinical examinations (OSCEs) and 27 in vignettes.

3. The simulation group attended five sessions in manual handling, resuscitation, infection control, managing violence and aggression and clinical decision making, leaving practice placements to take part. The sessions were run combining adult and children's nurses together, affording across branch learning opportunities. They then completed a final day completing OSCEs and vignettes. The control group attended for one day, to complete vignettes and OSCEs. Mentors were interviewed in placement settings.

4. Data collected included pre and post-test manual handling and resuscitation results were analysed using z and t-tests. Mean scores for vignette tests were computed and results for the two groups were compared using a t-test. The overall mean score for the OSCE was computed, with 75% set as the pass mark. A t-test was used to compare the two group scores. Interview discussions were transcribed and thematically analysed.

5. The results showed a significant improvement in manual handling knowledge and a highly significant improvement in resuscitation knowledge following simulation. The vignette results suggested the simulation group showed a significant improvement in learning, the simulation group achieving a significantly greater vignette scores than those in the control group. The OSCE results however showed no significant difference in performance across the two groups, though this may reflect the small numbers involved.

6. The mentor interviews on analysis identified four key themes. These included a lack of consensus as to what simulation is, the suggestion that student confidence and patient confidence in student performance would increase as a result of simulation and a belief that student learning would improve from simulation. Mentors also suggested that various issues would need consideration around the use of simulation. Only two felt practice hours could be replaced by simulation, all were in support of simulation and felt that it would offer scope for collaborative working between education providers and clinical practice staff.

   In conclusion, whilst acknowledging the limitations of using a small sample the results suggest simulation can offer an effective way of preparing pre-registration adult and children's nurses for practice.

1.0 Introduction

1.1 Background to the study

The increasing demands of working in complex healthcare situations means that nurse educators are struggling to find adequate clinical placements for their students (Rhodes and Curran, 2005). Time restraints and the number and quality of mentorship is further suggested as impacting on student ability to link theoretical knowledge to practical skills. Henneman (2005) notes that simulation can be integrated into nursing educational courses enabling students to practice skills in a safe environment. Simulation has been suggested as a way to bridge the gap between theory and practice.

A review of the literature showed simulation; a technique which has been used in fields such as aviation since 1930's (Scherer et al, 2003) is now being used in a variety of ways in nursing education and has been shown to have a variety of positive effects.

Rowles and Brigham (1998) have defined simulation as "a near representation of an actual life event" and suggested that simulation may be presented using computer software, role play, case studies, games, or manikins that represent reality and actively involve learners in applying the content on the lesson (Rowles and Brigham, 1998).

Two recent papers by Alinier et al (2006) and Nunn (2004) provide accounts of the effectiveness of simulation in supporting nursing students in the development of clinical skills. Alinier et al (2006) when looking at the effectiveness of scenario based simulation training technology in undergraduate nursing education, found intermediate fidelity training to be a useful technique in allowing small groups of students to develop knowledge of how to react in a critical care situation whilst being in a safe environment. Their findings highlighted this type of training as a useful way to help students develop a minimum standard of skills prior to working in a real life practice setting. The study provides quantitative evidence of a positive impact of

simulation training. However, simulation based training did not have a statistically significant effect on perceptions of stress or confidence about working in a highly technological environment, although Alinier et al (2006) reported feedback from the participants to be in favour of the use of such methods. Alinier et al (2006) further notes that simulation can be beneficial when used appropriately and suggests that students should play a major role and be 'in control' of the situation and decide on appropriate treatment and actions to enable them to make judgements and learn from their mistakes. They highlight the importance of regular feedback.

An earlier paper (Nunn, 2004) explored the effectiveness of simulation as part of a crisis management course for intensive care nurses run at the medical simulation centre at St. Bartholomews and the London NHS Trust. Ten nurses were involved with an introductory session and a video, after which two were involved in simulated ITU whilst the rest observed. Nunn (2004) concluded that simulation training offers "tuition that is constructive, realistic and highly participatory". She notes that simulators are ideal for technical and behavioural training, for individuals, small groups or teams. Nunn (2004) suggests that with current government led changes in healthcare provision such as implementing the European working time directive (DoH, 2003), healthcare training opportunities with real patients are likely to become scarcer and simulation centres could provide part of the solution for alternative training in nurses.

Simulation including role play and case studies have been shown to increase student self efficacy suggesting more confidence in performing health teaching. Goldenberg et al (2005) suggest the use of simulation as a teaching-learning method, applying simulation as a strategy to enhance other learner behaviors, and cultivating lecturer's use of simulation in their teaching. (Goldenberg et al, 2005) Simulation and the use of Human Patient Simulators are being used progressively to teach clinical nursing skills. Other simulation techniques currently of use are role playing techniques. Comer (2005) supports simulation as it provides risk free opportunities to practice clinical skills and develop clinical judgement. Nurses involved in role play reported

increased understanding of course material and a decrease in failure rate on the corresponding exam was observed.

Other research has supported the use of simulation:

- McConville (2006) suggested that using video clips to demonstrate to student nurses how to effectively cope with adverse situations is an effective teaching strategy for enhancing student self efficacy.
- Wildman (1997) has demonstrated that simulation can be a valuable approach used for preparing students for management experiences.
- Goddard and Jordan (1998) were able to show that the use of a teaching strategy employing simulation had a positive impact on student attitudes towards disabled people over time.

Phase one of the Review for Fitness for practice at the point of registration strongly supported the use of simulation and skills rehearsal as a vehicle for increasing opportunities for students to familiarise themselves with skills before rehearsing and consolidating these skills in practice. (Long, 2006). Nursing and Midwifery Council (NMC) were also asked by education providers to consider permitting some practice hours (currently 2300 hours over three years pre-registration training) to be used for simulation (Long, 2006). As a consequence the Nursing and Midwifery Council sought expressions of interest from educational providers to undertake a pilot study involving the use of designated practice hours for simulation. In total thirty three higher education institutions tendered for the pilot this faculty of Health and Social Care, UWE, was one of the thirteen successful institutions. The project has relevance for clinical practice as it is essential that students are adequately prepared to carry out clinical skill delivery during practice and have the ability to link theory and practice which is aided through simulation (Morgan, 2006). It is intended that the outcomes of the project should enable the NMC to consider whether current requirements need to be reviewed.

1.2 Purpose of the study

The research was conducted as part of a pilot study for the NMC to investigate whether simulation can support the development of clinical skills in pre-registration nursing students and if current requirements for training need review.

1.3 Research question

The research was guided by the following question:
Can the use of simulation support pre – registration nursing students in familiarising themselves with clinical skills before consolidating them in practice?

2.0 Methods

A multi method design utilising qualitative and quantitative methodologies in two phases was employed:

Phase 1- Student simulation experiment.
Phase 2- Nurse mentor focus groups.

2.1 Ethics approval and consent

Ethics approval was obtained from COREC and from the University of the West of England, Faculty of Health and Social Care Research Ethics Committee. This was secured prior to data collection. Voluntary purposive sampling was undertaken from both the adult and child branch students. Student recruits were provided with research information sheets detailing the aims of the project and involvement. Adult branch and child branch students recruited to the study provided written informed consent. Those forming the simulation group provided this prior to starting the first of the six simulation

days. They received two copies of the consent form, one to retain and one was held by the research team. Both copies were signed by the student with a witness signature. The consent process was overseen by members of the research team. Those in the control group completed this process prior to completing the vignettes and OSCE. Ward managers of the clinical areas supporting the students in the simulation group were sent a research information sheet explaining the project and a letter asking them to refer the information to the student's mentor. On receiving a positive response from the mentor, the research team sent mentors details of the interviews. The mentors were given research information sheets and asked to complete two copies of the written consent form.

The project leaders were not directly linked to the students as personal tutors and were not involved in the assessment of the students at this stage of the programme; thus reducing the potential for students to feel coerced into taking part.

2.2 Sampling strategy

Students on the adult and child programmes at the University of the West of England, Bristol undertaking modules with practice placements during September and December 2006 (September 04 and January 06 cohorts) were eligible participants for the simulation and control groups. The study recruited 69 to the simulation groups (See Table 1) and in all there were n=13 in the OSCE control group and n=27 in the vignette control group. Nurses acting in mentor roles for the students taking part in the simulation groups were involved in the study.

Table 1: Simulation Group

Group	Number	Percent
September 2004 Adult	27	39.1
September 2004 Child	22	31.9
January 2006 Adult	14	20.3
January 2006 Child	6	8.7
Total	69	100%

To add rigor to this pilot study a power calculation was performed as a guide for the sample size, though these aren't usually required for pilot work. The power for this pilot study was set at 80% with a 5% significance level. To control for any confounding variables or loss, in light of the exploratory nature of this pilot the sample size for each group was therefore set at 62. Unfortunately the study was unable to recruit these numbers. Student volunteers for phase one were randomised by the research team into the control and simulation group placing volunteers randomly into either one or the other group.

Eligible students were approached whilst in the university completing theory blocks. The research project was explained, a research information sheet outlining the project and involvement required was provided along with a letter of invitation to take part. The students were invited to return a positive reply to the letter of invitation to the research team within one week, volunteering to take part in the project. It is important to note that those volunteering for the simulation took part in various elements of the study, reflecting sickness and absence issues (See Table 2). Eligible nurse mentors were identified once the student volunteers were known and contacted via Ward Managers.

Table 2: Simulation groups for sub-studies

	MH		BLS		OSCE		Vignette	
Cohort	Number	Percent	Number	Percent	Number	Percent	Number	Percent
September 2004 Adult	24	38.7	16	32.0	10	25.0	13	27.1
September 2004 Child	19	30.6	17	34.0	14	35.0	18	37.5
January 2006 Adult	13	21.0	11	22.0	11	27.5	12	25.0
January 2006 Child	6	9.7	6	12.0	5	12.5	5	10.4
Total	62	100%	50	100%	40	100%	48	100%

2.3 Data collection methods

2.3.1 Phase 1

Phase one of the study used a simulation and control group. The simulation groups were absent from their practice placement setting for a total of six days. Five of the six simulation days were focused around basic life support, manual handling, infection control, clinical decision making and managing violence and aggression. Theoretical preparation was delivered using existing university educational materials. Simulation was used in order to apply theory to practice. Knowledge gained in basic life support and manual handling was then tested through the use of multiple choice questionnaires. The sixth day was used in order to consolidate learning through observed structured clinical examinations (OSCE's). The students then completed the vignette scenarios (n=48) and a written evaluation of their experiences on the simulation days and their ability to apply this to practice. Forty of the students volunteered to have their OSCE videoed for analysis. In the control group students from the same adult and child programmes completed the vignettes (n=27) and volunteered to take part in OSCEs (n=13). This took place within a work-based learning day, as part of academic course time. The results of the vignettes and OSCE analysis have been compared. All nursing students had practice placement mentors who are qualified nurses.

2.3.2 Phase 2

In phase two of the study mentors for students in the simulation group were invited to take part in individual interviews to discuss the possible impact of simulation on the development of their student's clinical skills. The interviews involved six nurse mentors in total. The research was overseen by an Advisory Group with representatives from the Work Force Development Confederation and the University.

2.4 Data analysis

2.4.1 Phase 1

The pre and post-test basic life support (BLS) and manual handling (MH) data were computed to achieve frequency measures and descriptive statistics. The vignette and OSCE data were also analysed producing frequency tables and descriptive statistics. Paired t-tests were computed for the BLS and manual handling to see if there was a significant improvement in post-test scores following simulation. A z-test was calculated for BLS and manual handling to ascertain whether the proportion of students who passed the post-test was significantly greater than the proportion who passed the pre-test. A t-test was used to see whether the simulation group achieved significantly greater mean scores in the OSCE. A pass mark was set for the OSCE at 75%, a z-test was used to see if the proportion passing in the simulation group was significantly greater than in the control group. Finally, a t-test was computed to see if the simulation group achieved a significantly greater result in the vignettes than that seen in the control group.

2.4.2 Phase 2

Interview data were prepared for analysis by producing of verbatim transcripts. Two research team members reviewed each transcript to enhance the rigour of analysis and provide some measure of inter-rater reliability. The analysis was based on Pattern coding and Pre-structured Case Analysis, supporting data reduction, display and conclusion drawing using the framework suggested by Miles and Huberman (1994). The emergent issues were coded by each researcher, then merged into themes and are presented as themes with illustrative data.

3.0 Results Phase 1

3.1 Manual Handling results

Sixty-two participants completed the pre training and post training manual handling multiple choice questionnaires (MH-MCQ). The pass mark for this was set at 75%. Fifty-four (87.1%) participants passed the pre training MH-MCQ and 58 (93.5%) passed the post training MH-MCQ.

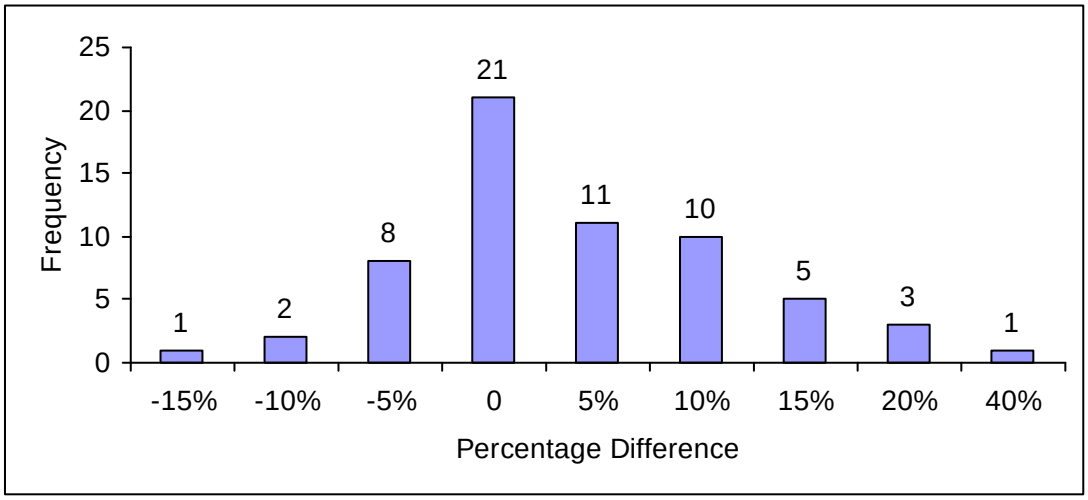
The mean score for the pre training MH-MCQ was 85.5% (95% CI 82.7 to 88.2; SD 10.85333) and the mean score for the post training MH-MCQ was 89.6% (95% CI 87.2 to 92.0; SD 9.42174) demonstrating a small overlap of the pre and post training confidence interval. The mean score for the post training MH-MCQ was 4.1% greater than the pre training mean. To test whether MH training would significantly improve the score on the MH-MCQ a paired *t*-test was undertaken. The result ($t = 3.660$, d.f. = 61, $p < .01$) was achieved, suggesting there was a significant improvement in MH knowledge following the simulation.

The proportion of students passing the pre training MH-MCQ was 0.871 (95% CI 0.788 to 0.954). This increased to 0.935 (95% CI 0.874 to 0.996) in the post training MH-MCQ. A z-test was used to compare whether the proportion of students passing the post training MH-MCQ after simulation was proportionately greater than those passing the pre-training MH-MCQ ($z = 1.503$, $p = 0.0668$). The results demonstrated that although the proportion increased, there was no evidence to suggest that the proportion passing was significantly greater in the post training MH-MCQ. This does not necessarily mean the training is in-effective, the explanation for the non-significant increase is more likely to reflect the fact that a large proportion passed the MH-MCQ prior to the training.

Ten (16.1%) participants post training MH-MCQ score was lower than the pre training score, 21 (33.9%) participants had the same score in both MCQ's and

31 (50%) increased their scores in the post training MH-MCQ. Out of the 21 who maintained their score six scored 100% in both MCQ's (see Figure 1).

Figure 1: Percentage difference in pre and post training MH-MCQ Scores



3.2 Basic Life Support results

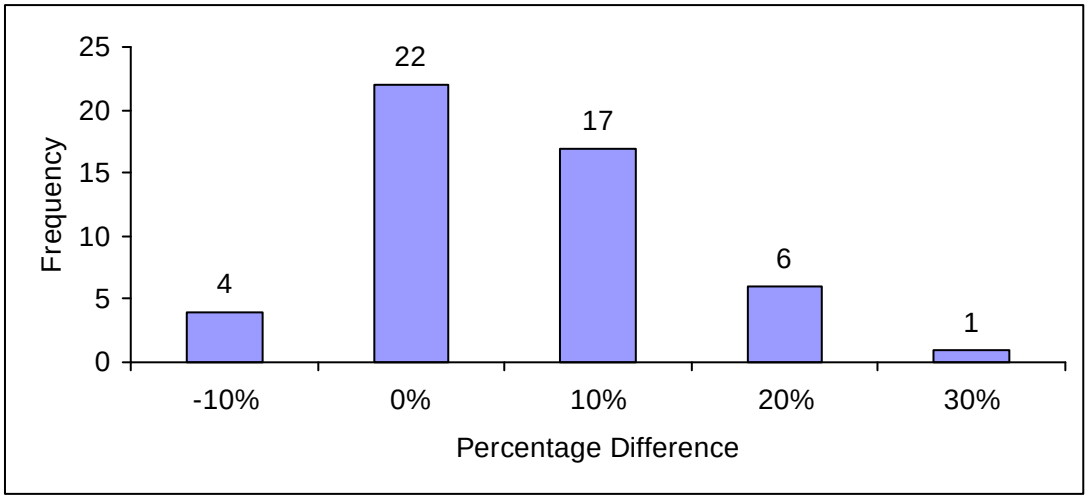
Fifty-three participants completed the pre-training Basic Life Support multiple choice questionnaire (BLS-MCQ), 52 completed the post training BLS-MCQ and 50 completed both. The pass mark for the MCQ was set at 75%. Thirty-nine (73.6%) passed the pre training MCQ and 47 (90.4%) passed the post training MCQ.

The mean score for the pre training BLS-MCQ was 82.8% (95% CI 79.3 to 86.3; SD 12.461) and the mean score for the post training BLS-MCQ was 88.4% (95% CI 85.7 to 91.1; SD 9.553) demonstrating a small overlap in the confidence interval for pre and post training. The mean score for the post training BLS-MCQ was 5.6% greater than the pre training mean. A paired *t*-test was undertaken. The result ($t = 5.6$, d.f. = 49, $p < .001$) is highly significant, identifying that student learning improved through simulation.

The proportion of students passing the pre training BLS-MCQ was 0.736 (95% CI 0.617 to 0.855). This increased to 0.904 (95% CI 0.824 to 0.984) in the post training BLS-MCQ. Using a z-test to measure whether the proportion of students passing the post training BLS-MCQ was greater than the proportion passing the pre training BLS-MCQ ($z = 2.775$, $p < .01$) demonstrating that the proportion of those respondents passing the post training BLS-MCQ was significantly greater than the proportion passing the pre training MCQ. This suggests the use of simulation can support BLS learning opportunities.

Four (8%) participants had a lower post training BLS-MCQ score, 22 (44%) maintained their score and 24 (48%) improved their score (see Figure 2). Out of the 22 who maintained their score eight achieved 100% in both MCQ's.

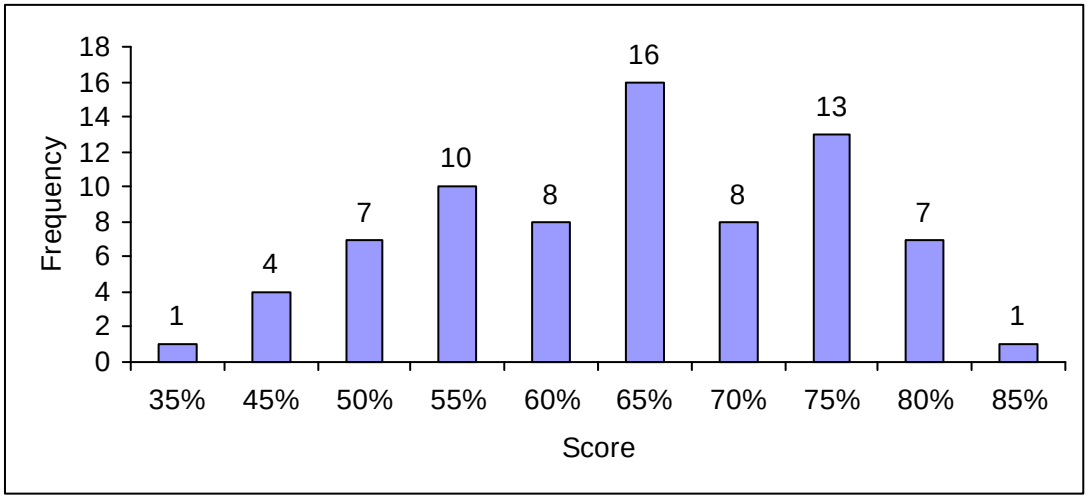
Figure 2: Percentage difference in pre and post training BLS-MCQ Scores



3.3 Vignette results

Seventy-five participants took part in the vignette. 48 (64%) were in the simulation group and 27 in the control group. There was no pass mark awarded for the vignette. The overall mean score for the vignette was 64.2% (95% CI 61.7 to 66.7, SD 10.844), the minimum scored was 35% and the maximum 85% (see Figure 3).

Figure 3: Vignette Scores (n = 75)

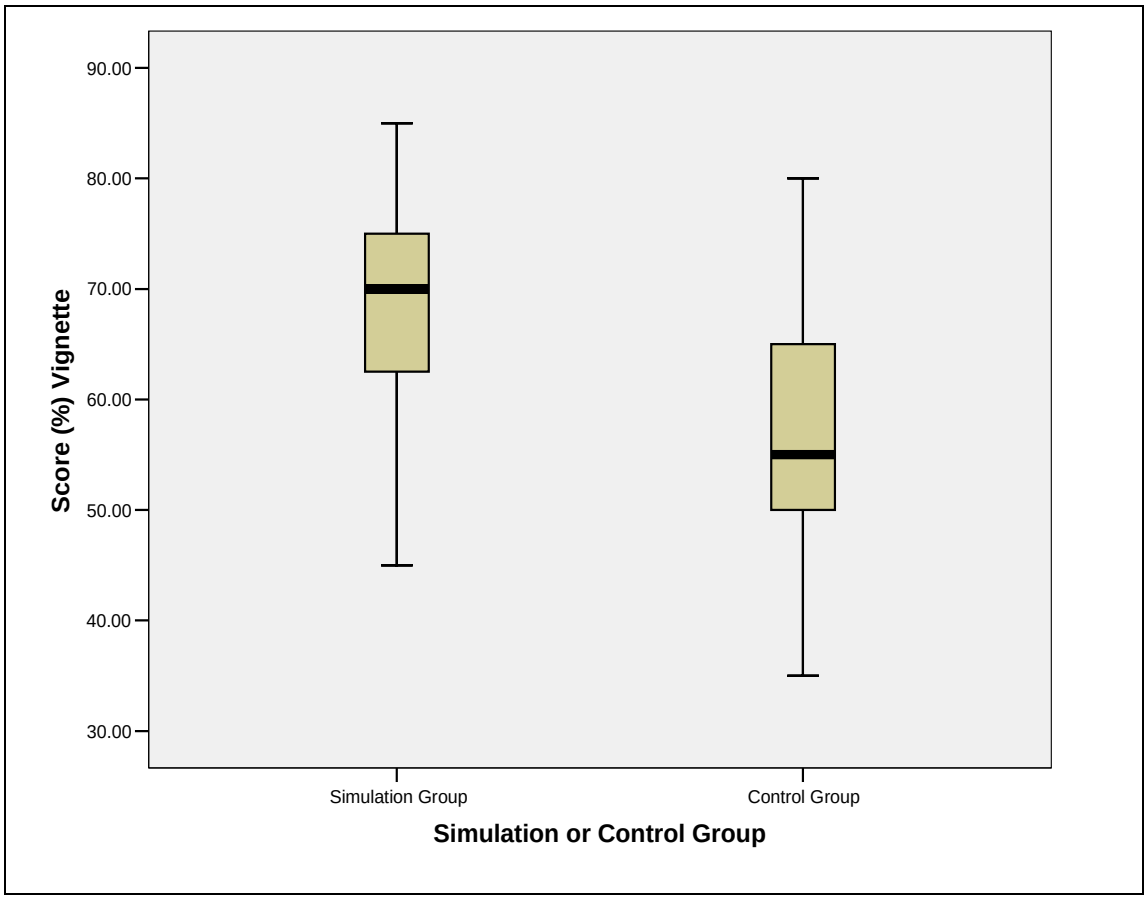


The simulation groups mean score was 68.5% (95% CI 65.4 to 71.5, SD 9.400). The minimum scored was 45% and the maximum 85%. The control

groups mean score was 57.6% (95% CI 53.6 to 61.6, SD 10.036). The minimum scored was 35% and the maximum 80% (see Figure 4).

A *t*-test was performed that demonstrated that simulated learning can significantly improve learning with students in the simulation groups achieving significantly greater vignette scores than those in the control group ($t = 4.427$, $p < .01$).

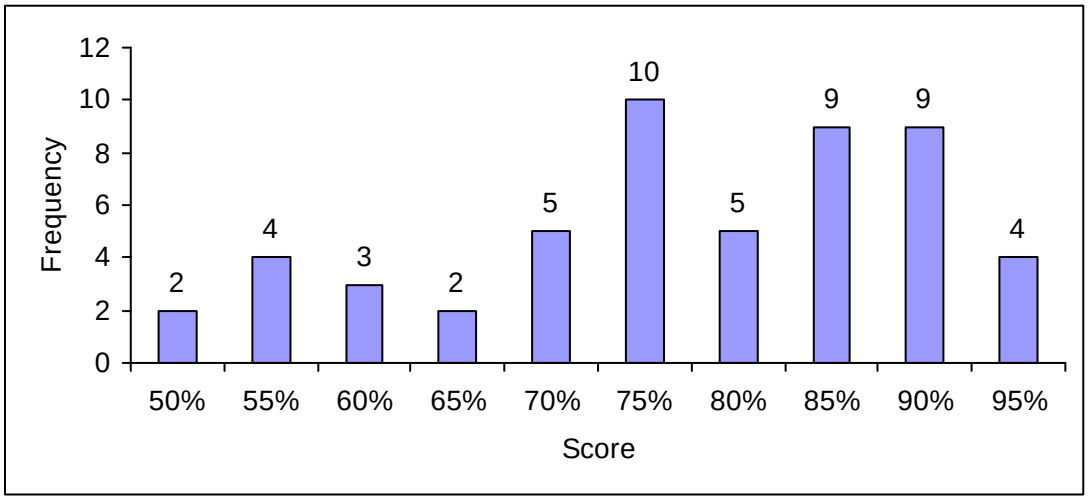
Figure 4: Vignette Scores for Simulation and Control Groups



3.4 OSCE results

Fifty-three participants completed the OSCE, 40 (75.5%) were in the simulation group and 13 (24.5%) in the control group. The pass mark for the OSCE was 75%; overall 37 (69.8%) participants passed the OSCE (see Figure 5). The overall mean score for the OSCE was 77.1% (95% CI 73.6 to 80.6, SD 12.612), the minimum scored was 50% and the maximum 95%.

Figure 5: OSCE Scores (n = 53)

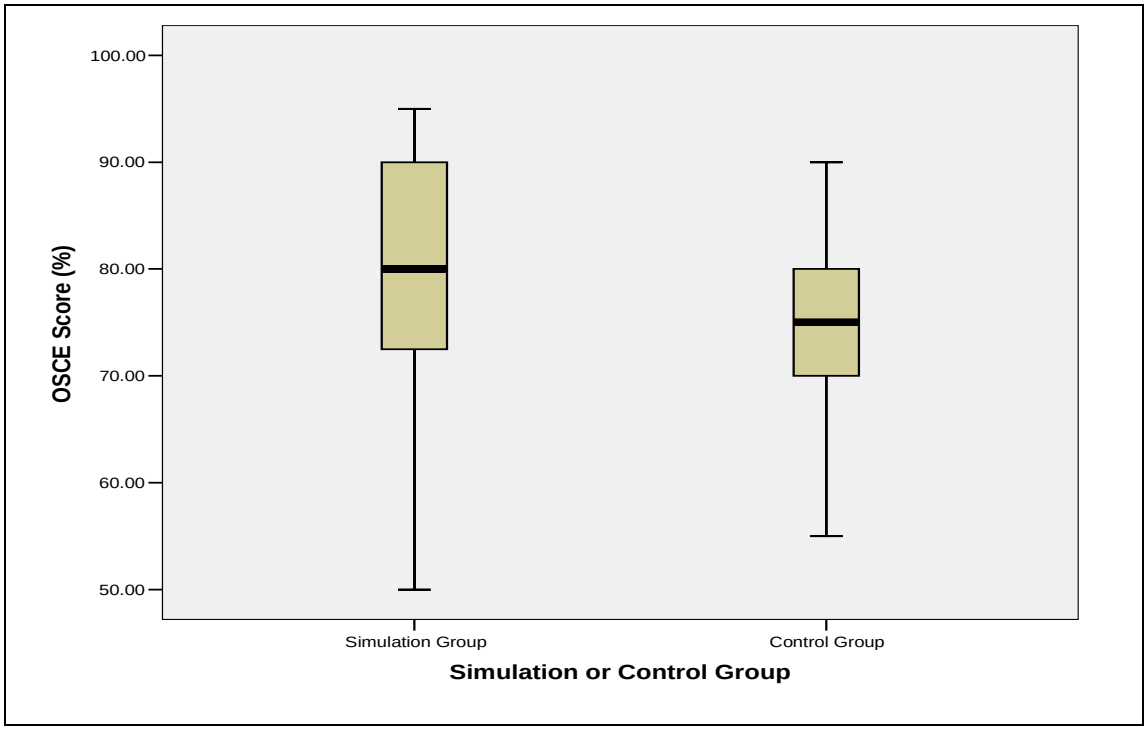


The simulation groups mean score was 77.8% (95% CI 73.5 to 82.1; SD 13.268). The minimum scored was 50% and the maximum 95%. Thirty (75%) in the simulation group passed the OSCE. The control group mean was 74.2% (95% CI 67.7 to 80.7, SD 10.772). The minimum scored was 55% and the maximum 90%. Seven (53.8%) in the control group passed the OSCE (see Figure 6).

A *t*-test showed no statistically significant difference in the mean scores between the simulation and the control groups (t = .935, df = 51, p = .354).

The proportion in the control group passing the OSCE was 0.538 (95% CI = 0.267 to 0.809) and in the simulation group 0.750 (95% CI 0.616 to 0.884). To test whether the proportion of the simulation group who passed the OSCE was greater than the proportion of those passing in the control group a z test was performed (z = 1.553, p = 0.0630). Although the proportion passing was increased this was not a statistically significant result, there is no evidence therefore that the simulation groups learning significantly increases the proportion passing OSCEs, though it should be recognised that the numbers taking part in the control OSCEs were much reduced and this has affected the outcome.

Figure 6: OSCE Scores for Simulation and Control Groups



4.0 Discussion – Phase 1

Overall simulation has been shown to be effective in developing knowledge and skills in the areas piloted that included MH, BLS, infection control, managing violence aggression and clinical decision making. The simulation has had a statistically significant effect on knowledge gain between pre and post test MCQ results in BLS as seen in previous resuscitation skills research (Moule, 2002). The proportion of students passing the BLS MCQ following simulation was considerably greater than seen in the pre-test. The proportion of students passing the manual handling MCQ did not significantly increase following simulation, however, over 87% passed the pre-simulation test. Therefore the scope for improvement was limited, as their initial knowledge was so great. This may reflect a change in local manual handling training within the faculty following a review of all manual handling provision in 2004 which has resulted in a more scenario and simulation based approach to skill development.

Van Eerden (2001) reported positively that vignettes offer a controlled method in the assessment of student performance reflective of their actual practice. Accepting the value of vignettes as an assessment tool, the results of this study are interesting. As in previous research with qualified staff (McGuigan and Moule, 2006) the students found the vignettes challenging. Despite this, the students were able to complete the vignettes with the simulation group achieving significantly greater scores in the vignettes than the control groups. This suggests the simulation group were able to apply their learning to the vignette scenarios to a greater extent than the control group.

Previous research has documented the benefits of using OSCE assessments to support the development of practice skills (Rennie and Main, 2006). The use of OSCEs in health care assessment has been in place for some time (Harden and Gleeson, 1979; Ali et al , 1996), predominantly in medicine and the allied health professions, though with some development seen in nursing (Nicol and Glen, 1999). Employed in this research, the results achieved are worthy of note. The difference seen in OSCE performance between the simulation and control groups was minimal. The proportion in the simulation group passing the OSCE was greater than the proportion in the control group. However, this was not a statistically significant increase, with the simulation group achieving a mean score of 77.8% and the control group a mean score of 74.2%. This may reflect limitations of the study, resulting from a small sample size being secured for the control OSCEs that included only 13 participants.

5.0 Findings and discussion – Phase 2

Four key themes emerged from the discussion. These are presented below with direct verbatim quotes to support.

5.1 Understanding of simulation

During the interviews it was apparent that a number of the mentors were not fully conversant with the application of simulation in pre-registration nurse

education. A number were confusing simulation with clinical skills teaching and role play. Whilst three of the mentors interviewed were able to discuss simulation, showing understanding of this, three were unable to demonstrate full awareness of the complexities and benefits of simulation and its use in nurse education. They tended to view simulation as clinical skills teaching, reflecting on their own training that involved students practising skills on one another and practising these skills in isolation.

5.1.1 Simulation viewed as clinical skills teaching

Mentors drew on their own learning experiences to make sense of the simulation that their students were undertaking.

> *P 1 'Well you know, I did my sort of training twenty years ago and, well more than twenty years ago and we used to um, actually simulate manual handling, um on each other, we would do, um we would have babies, um you know sort of dolls that we would wash and dress and we would have dummies in the beds that we would wash as well and give a bed bath to, um making beds and you know that sort of thing, which is really sort of right in the beginning of your training, but then we also used to come in and used to have to practice um you know giving injections on oranges and things like that so and first aid we have always done first aid on each other, so we were able to bandage each other up and we would do um, you know first aid on manikins as well, you know CPR and things like that so when you said to me, when I was asked to give my views on it I thought we already do that'.*

> *P 4 '…..I can remember being fed by a fellow student and you know performing mouth care and manual handling. I know you do that anyway, but I think it is all the same sort of thing, hands on stuff. But also practical things like taking a blood pressure, yeh, sizing cuffs, making sure that you put it in the right position and doing it manually, obviously using a dynamap is crucial, um and also practice on each other, doing a simulation you can um, you can almost have an empathy with the patient then, so I am thinking the hands on stuff, but also the practical stuff, obviously you can't practice injection techniques on individuals but you can do blood pressures and temperature monitoring, recording pulses and that sort of thing'.*

These views further support the use of clinical skills teaching and demonstration in a safe practice environment a theme that has remained evident within the literature (Wildman, 1997; Jeffries et al, 2002; Morgan, 2006), but suggest that some mentors may need educational preparation to

use simulation. Simulation is employed in a variety of ways in nursing education, being seen as "a near representation of an actual life event" (Rowles and Brigham, 1998).

Simulation may be presented using a variety of means including computer software, role play, case studies, games, or manikins that represent reality and actively involve learners in seeing the taught skills within their clinical context (Rowles and Brigham, 1998). Simulation goes much further than clinical skills demonstration. It not only provides a safe environment for skills development and confidence in skills delivery, but supports the student in approaching clinically based scenarios and making decisions about care delivery. Simulations provide an opportunity to relate an up to date evidence base to inform practice decisions and clinical confidence and competence.

5.2 Increased confidence

The mentors believed that student involvement in simulation would contribute to the development of confidence in practice. In turn they felt this would have a positive effect on patient's who would themselves have greater confidence in the student's ability to deliver care.

5.2.1 Students and patients will develop confidence through simulation

Mentors described confidence developing amongst students and patients.

> *P 3 'Well I can't help but think that they must be a good idea to practice in a safe environment; the student nurses feel that if they do make any mistakes it is not going to be something terrible and there is going to be someone there to talk them through things. Um and also to make them feel more confident on the ward and doing things, you know for real when that have to really'.*

> *P 1 'Um, well it will benefit patient care because I think it gives, um, the student more confidence to actually deal with something and if they feel more confident then the patients are going to feel more confident when they are being looked after by people who appear to know what they have done and perhaps have been in that situation before or be it a simulation'.*

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The use of simulation and skills rehearsal as a vehicle for increasing opportunities for students to familiarise themselves with skills before rehearsing and consolidating these skills in practice was reported on Phase one of the Review for Fitness for practice (Long, 2006). The potential benefits of increased confidence in skill delivery gained through simulation have been identified previously. Two studies reporting on the development of confidence and self-efficacy amongst first year students found simulation beneficial. The students reported increased confidence in their ability to practise, feeling adequately prepared for their placement experiences (McConville, 2006; Morgan, 2006). There is minimal evidence reporting the potential impact of simulation training on patients, something that may usefully be explored through future research.

5.3 Student Learning

It was apparent from the discussions mentors had had with allocated students that learning had occurred following the simulations. This seemed to be multi-faceted and related to team working experiences as well as arising from completing various scenarios. The simulations also afforded opportunities for interprofessional learning as students from adult and children's nursing worked together.

5.3.1 Mentor's report student learning following simulation

A number of papers identify student learning occurring during simulation and the following Objective Structured Clinical Examinations (OSCEs) (Nunn, 2004; Alinier et al, 2006; Morgan, 2006). It was apparent from the discussions that the mentors felt their students had found involvement with the project a positive learning experience.

P 6 ' The students have some experience of practice before they come to the wards, which will take the pressure off practice to provide all the learning opportunities to achieve the practice outcomes.'

P 2 'Well having spoken to my student, yes I think so. For instance the student that I have got does have um some learning issues. …… for ……. is finding this really beneficial'.

P 1 'But after speaking to my student, um, she learnt from um the scenario, not necessarily the actual doing of it, like the CPR and stuff like that, it was the scenario that you were putting them in, so she said that you would say right here is a person lying on the floor, they have had x, y and z done to them, what would you do? You know, so it was that what she felt that she learnt more from, it was the actual scenario, it was taking part in it, being perhaps in control or not in control and being part of a team and that is where she learnt more of her skills from, not doing the CPR and things like that it was the actual taking part in it, having a different scenario to think of and actually working in a team'.

Mentors also felt students would learn from having feedback on the simulation and on their performance in OSCEs, which they could then reflect on and use in future practice.

P 2 'I think from my point of view when I sit and meet with them on a one to one, because I am not just working along side them but we have one to ones, I can gain quite a good understanding of what …. is getting from it and how it is making … feel, um, that… can understand certain situations and experiences and also the feedback that…. is getting is making …. feel quiet positive as well'.

5.4 Supporting simulation

The mentors identified several factors that they felt would need consideration should simulation be further incorporated into the pre-registration curriculum. It was particularly interesting to note that views amongst mentors varied when asked whether simulation hours could replace current practice. Two mentors felt simulation hours could reasonably replace time spent in practice, whereas four held opposed views.

5.4.1 How to support simulation

Those mentors who spoke positively about using placement hours for simulation suggested:

> *P 2 'I can only um reflect on the two that I have got now, and the one is doing it and the one isn't and I think the one who is doing it um, is getting an all round better knowledge of things, so I think if it was a day a week or a day a month'.*

This mentor also commented that simulation could provide opportunities for students to rehearse care delivery, using cases not readily available in practice settings.

> *P 2 'Well I think for the student because they are not deemed to be um part of the work force, there are some things that maybe they don't get involved with on their placement whereas if they can get a feel of it through simulation then that's good…'*

One mentor reflected upon their own training when agreeing simulation might replace practice hours:

> *P 3 ' I am just thinking of my own training and I am sure that I would have preferred it that way. I mean I suppose other people might think differently but I think I would say yes for that'.*

It is interesting to note that four of the mentors were not supportive of simulation replacing practice hours, though all commented that currently providing support for students in practice can be a strain on placement staff and it was felt that time pressures and the need to provide learning opportunities to support learning outcome achievement might be aided through simulation.

> *P 5 'I think it would in that it would probably take the stress off the wards, because we have a lot of students and I think maybe some times if a ward is very busy, some students on some wards I know do get neglected, so it is ensuring that everyone does get the skills taught that they need'.*

> *P 6 ' I think it would aid mentors regarding the time and staffing pressures. Rather than starting from scratch the student will have some*

experience which will relief the pressure of learning opportunities due to time pressures'.

It is noted that time restraints and the number and quality of mentorship can impact on student ability to link theoretical knowledge to practical skills. Mayne et al (2004) further believe that this is exacerbated by the increasing number of nursing students making it difficult to guarantee students exposure to relevant learning opportunities and mentor support. It was recognised by the staff interviewed in this pilot work that simulation can support mentors and students in achieving learning outcomes, though there remain debates and divided opinion as to whether simulation should take place in clinical or theory hours.

5.4.2 Practical and organisational issues

The mentors felt that simulations should take place in the university and be facilitated by those staff deemed credible. Mentors also suggested that simulation offers a valuable opportunity for collaborative working, with the potential to give clinical staff scope to contribute to scenario development and simulation delivery and assessment.

P 1 '… as long as the university staff are up to date, because you know it is very easy to come out of clinical practice, things change so quickly and then if the staff are not right up to date then they could be teaching slightly the wrong thing to do'.

In additional to credibility issues, the need for joint working was expounded by all mentors.

P 4 'I think we need to be communicating definitely, to find out, I think the university needs to be finding out what is happening on the wards, so that the skills that they are teaching are completely relevant and we are all teaching the same thing, there has to be a consistency and continuity, so that we know what they are teaching at university that we are doing on the wards and visa versa, we need to know, so that we don't confuse the poor students and that we are saying the same thing really'.

P 6 ‘ Simulation should be the initial week of clinical placement, needs to be relevant and tailored to the placement and student level… Need to get the trusts on board and ask individual assessors’.

A number of papers identify the use of skilled practitioners to support simulations (Morgan, 2000; Murphy, 2000; Nunn, 2004). Practice may vary with simulation being supported by practitioners or members of clinical skills teams, well versed in simulation facilitation and clinical skills support. It is apparent that simulation will require facilitation by those familiar with current practice and an ability to manage simulation scenarios, including approaches to managing feedback and the use of role play or the increasing available interactive manikins and wards.

6.0 Conclusions

Whilst acknowledging the limitations of the small control sample size and the inability to achieve participant numbers desired following power analysis, the results of this pilot study suggest simulation can offer a effective way of preparing pre-registration adult and child nursing students for practice. It is evident that there is scope for students of nursing to gain knowledge and skills from simulation. Students have also shown an ability to apply this learning to practice scenarios through vignettes and OSCEs. Mentor feedback has highlighted the benefits of increased confidence being developed amongst students and of the potential this has to translate to the patient care setting. The mentors highlighted a number of issues that would require consideration should simulation be adopted more widely. They identified simulation as offering the potential for further collaborative working between universities and practice staff. Amongst the mentor sample there was no consensus of opinion as to whether simulation was based placed within theory or practice hours.

7.0 Dissemination strategy

The results will be disseminated through the following channels:

- UWE Website.

- Faculty: The results will be put forward for the presentation to the Faculty at the E-learning and Health Informatics Seminar (Summer 2007) and the staff development day in January 2008. Feedback to the Learning Teaching and Assessment Committee and the Policy Resource Management Committee.
- Nursing Midwifery Council (NMC) dissemination of project outcomes.
- External paper: Results will be submitted to a high quality peer reviewed scientific journal.
- External stakeholder feedback.
- Abstract accepted at Royal College of Nursing (RCN) International Nursing Research Conference, University of Dundee, May 2007.

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