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– 'docendo ac discendo' – 'by teaching and by learning' –

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A Peer Reviewed International Journal for the Advancement of Clinical Skills
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This issue:

Can we instinctively estimate vital signs?

Student-tutoring scheme – the blind leading the blind, or a useful tool?
Venepuncture – a necessity or 'reflex testing'?
Learning through simulation – taking control

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The International Journal of Clinical Skills looks forward to contributing positively towards the training of all members of the healthcare profession.

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Foreword

In line with our commitment to advance learning, knowledge and research worldwide in the clinical skills field, the launch issue of the International Journal of Clinical Skills (IJOCS) provided informative quality articles for the global healthcare arena. Integrating individual and collaborative clinical research makes the IJOCS success so huge.

The continued expansion of IJOCS is being mirrored by a programme of long-term commitment by our business partners, so that our continued pledge to the academic community and subscribers, can be fulfilled both now and into the foreseeable future.

Good healthcare professionals use both individual clinical expertise and the best available external evidence, and neither alone is enough. Without clinical expertise, practice risks becoming tyrannised by evidence, and without current best evidence, practice risks becoming rapidly out of date. This is where the IJOCS provides an invaluable tool to enhance patient care. Containing innovative research from a broad sweep of subject areas, IJOCS provides a groundbreaking stance in this educational field. The launch of the IJOCS remains a hot topic for clinicians, academics and students alike.

As well as the IJOCS, we now have the pending excitement of the Clinical Skills Lab (CSL). This is a free not-for profit database sponsored by the IJOCS. CSL has over 100 contributors, and it aims to publish information on clinical skills for the purposes of teaching and learning. This material will be available on a global scale via the internet, and will be an evolving database, encouraging contribution from the clinical skills community.

The IJOCS has proved to succeed in its original aim, which was aptly put by Professor The Lord McColl of Dulwich: '*…the International Journal of Clinical Skills will not only enhance our attempts to provide a quality health service, possibly with some standardisation, but also provide a vehicle for teaching and learning…*'

I would like to express my gratitude to all of my colleagues, sponsors and subscribers, who continue to support this unique publication.

The International Journal of Clinical Skills – 'by teaching and by learning' – 'docendo ac discendo'

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Effectiveness of simulation on promoting student nurses management skills

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Abstract

The purpose of this study was to explore the effectiveness of simulation on promoting student nurses management skills. A review of the literature suggests that newly qualified nurses are not adequately prepared for their role as staff nurse. Deficits in management skills are the main areas of concern for both newly qualified staff and hospital employers. Consequently, all involved in students' clinical learning environment are charged with the responsibility to devise sound innovative and effective teaching methodologies to prepare students for their role as staff nurse upon registration.

A simulation exercise was conducted in Dublin City University by the Clinical Education Centre project team for fourth year general undergraduate student nurses. The main focus of the simulation was to promote consolidation of knowledge in the areas of organisation and management of patient caseload, clinical practice, and communication, legal, ethical and professional issues. A qualitative and quantitative approach was used for this study. Ninety students participated in the simulation exercise and 68 completed the questionnaire. Six focus group interviews were conducted with 15 students in each group. Results identified that simulation is a realistic and enjoyable way of learning and helped prepare students for their clinical role as staff nurse. Students indicated that they felt the exercise had helped them to consolidate their previous knowledge, felt more confident and were able to determine their own learning needs. However, participating in the simulation exercise was also seen as a stressful experience for some students. In conclusion, simulation used as an educational strategy running parallel and closely linked with clinical experience, is a powerful tool to prepare students for their role as staff nurse. It allows students to reflect on and learn from their strengths and weakness promoting improvement on their management skills and enhancing nursing services.

Background

Employers of the health service require qualified and competent staff nurses to provide quality nursing care. The nature of the newly qualified nurse's role has changed with an expectation that they can assume responsibility to manage an increasingly complex clinical environment. Consequently, it is essential that student nurses be equipped with management skills such as prioritising and managing an allocated workload, dealing with unexpected events and delegating tasks which are necessary for newly qualified nurses. However, currently there is evidence to suggest that students are inadequately prepared for their role as staff nurses. Gerrish[1], Mole & McLafferty[2] and Tzeng[3] identified from their studies that students lacked knowledge and skills in the management of patients as well as the organization of the environment. The same problem was identified in Ireland. Simmons H, Clarke J, Gobbi M, et al.[4] conducted an evaluation on nurse education and training in Ireland, and reported that student nurses lacked managerial skills on registration.[4]

A European directive recommended that nurse education should be based on a four year degree programme, in 2002 the BSc (Hons) nursing degree programme was developed and nurse education was transferred from hospital-based schools of nursing, into third level institutions in Ireland. As this new programme rolled out, anecdotal evidence from students expressed concern about their role transition from student nurse to registered staff nurse. Particular concerns were highlighted about difficulties they experienced in relation to managing and prioritising care when caring for a group of patients. A review of the 4th year curriculum revealed there was little opportunity to help students consolidate knowledge and skills developed in previous years. Individual skills were taught in isolation whereas in the real world any one patient will require a number of different interventions performed simultaneously to provide holistic care.

There are a number of other contributing factors that may explain the lack of certain management skills. While students were on their rostered placement they were often sent to external placements instead of having students develop their various managerial roles in their parent hospital. Recently, student's clinical placements on their final year of the programme have decreased from fifty two weeks to thirty six weeks. In addition to this, Chanely[5] found that students experienced a difference of value systems between nurse educators and clinical practice. Where practice areas stress the importance of management of tasks, where as O' Shea and Kelly[6] found that nurse educators place importance on patient care suggesting that they place less emphasises on various managerial roles. Also, educators have a tendency to use a didactic style of teaching to discuss theories and principles of management. Didactic teaching can make it difficult for students to apply the theories and principles when managing a ward. As there can be a number of complex activities occurring at the one time on the ward. Further more, Gerrish's[1] study found that there are shortfalls in the nursing curriculum, particularly with regard to the development of managerial skills. The need for programme content that would meet those needs was identified.

Simulation is described as being extremely useful for narrowing the theory-practice divide, as it provides a realistic experience in a highly controlled and supportive environment.[7] Simulation not only places the learner in a lifelike situation that entails the student gathering information, processing that information and making effective decisions based on this process, it also provides an opportunity for immediate feedback that offers

the student an accurate assessment of his/her performance.[8] While this teaching approach enables students to reflect upon prior learning, it also allows for analysis and synthesis of the information learned during the simulation exercise and to process this information into existing knowledge[9]. Rauen[10] states that simulation also allows students to think on their feet, as existing knowledge must be accessed speedily and be applied to a simulated clinical situation. Thus, simulation offers constructive, realistic and highly participative learning.

Mole and McLafferty[2] report that opponents of simulation claim simulation does not help students' to learn about real–life situations or doesn't ensure the transfer of skills from the simulated environment to clinical practice. Conversely, research studies have shown simulation practice can prepare students with skills that can transfer into practice, promote self confidence and improve clinical judgement[11,12,13]. Moreover, recent research studies measuring knowledge gained from simulations have found that learning outcomes achievement was as good as those from lectures and other formal methods of learning.[14,15,16] Higgs[17] states that simulations encourage students to learn by understanding and not by memorising theory and principles. Furthermore, creating a simulation practice session that mimics the real hospital setting when ran parallel to students' clinical placement can maximise the students learning so that they gain the full benefit of simulation as a learning tool.[18] As a strong emphasis has been placed on using innovative teaching methodologies to prepare student nurses for clinical practice[19], the aim of this study was to explore the use of simulation for its effectiveness as a teaching strategy to promote student nurse's managerial skills as part preparation for registered nurse.

Preparation for simulation

A simulation project team was established consisting of nursing lecturers and clinical skills nurses from the School of Nursing, and nursing staff from clinical practice. The input of clinical colleagues was important to mirror some dimensions of clinical and management skills. Learning outcomes were identified to meet the needs of newly qualified staff nurses and then developed with reference to the An Bord Altranais' (The Irish nursing board) competency framework.[20] Scenarios were identified for the learning outcomes. Detailed scripts were written for each scenario. The organisation of the environment and resources required were also identified.

Three pilot studies took place on a small scale. The first pilot study took place with staff enacting all roles to check the facilities and equipment. The second pilot took place with staff enacting all roles to check the scenarios. The final pilot took place with three 4th year nursing students acting as nurses and volunteers from the local community acting as patients to review the entire exercise and test the questionnaire. The pilot studies allowed for trouble shooting and better organisation for the main simulation session. For example, when running the first pilot study events were not synchronized, which caused staff playing the role of students to feel overwhelmed. Events needed to be placed in 'real time'; thus, the scheduling of time was added to each scenario. In addition to this it was identified in the second pilot that scripts needed to be made 'tighter', this is, patient's scripts needed to be more detailed and include information about the patients underlying condition to enable the actors to fulfill the requirements of the role. Medium fidelity mannequins were identified as appropriate for two of the scenarios that required clinical interventions. Wilson et al[21], Ambrose et al[22], and Stark[23] found that mannequins are sufficiently realistic for improving clinical performance and are suitable for teaching purposes.

The simulation

The students received an orientation to the clinical area. During this time questions were addressed and clear details of the expectation of each member of the team were provided. A member of the project team ensured that the students were clear on the aims of the session, and the expected learning outcomes. Students were made aware in advance that this exercise was not linked to an assessment strategy in their nursing programme. Due to time and human resource constraints it was not possible to facilitate all students to play the roles of nurses. It was decided that some students should play the roles of patients in order to allow all of the 4th year students to experience the simulation exercise. The cost of using School of Nursing Staff or actors to play the roles of patients would have been prohibitive.

To maintain realism in terms of nurse/patient ratio a group of 4 students to 11 patients were used to ensure visibility of students by assessors and to minimise the risk of some students assuming a passive role. The session commenced with the clinical nurse manager giving a verbal patient handover at 10am. Then the clinical nurse manager left the ward/unit but was available to students via telephone. This was to encourage students to work through the various issues using their own clinical judgment and decision making skills. Four observers, two from academia and two from clinical practice, watched the simulation exercise to see if it was meeting the identified learning objectives and to provide feedback to students. Students were given an option to fill out a questionnaire immediately after the simulation was finished. Debriefing and feedback sessions were held after the questionnaire was completed. This was to help students learn from both positive and poor practice and ensure that they went away with a positive belief about their own performance. Focus groups were conducted directly after the debriefing session.

Method

The simulation was conducted parallel to students' clinical placements. Students have 4 hours of independent learning time while on practice. The simulation exercise was conducted during these 4 hours. Ethical approval was received from the Research Ethics Committee in DCU. Written consent was obtained from each student before the simulation exercise. Each simulation had a group of 15 students. Four students acted role of staff nurse, 11 acted the role of patients and 2 mannequins were used as patients. Ninety students participated and 68 completed the questionnaires with a 75.5% response rate. Twenty one students played the role of nurses and 100% completed questionnaires. Sixty nine students played the role of patients and 47 completed questionnaires (68.1%).

Qualitative and quantitative methodologies were used to evaluate the simulation session. A questionnaire was developed by the project team and piloted with the students in the third pilot exercise and changes made accordingly. The questions were based on the learning outcomes, an extract of which can be seen in table 1. The questionnaire was completed by students after the simulation. The first section of the questionnaire consisted of a list of closed questions with 'yes' or 'no' answers about the simulation exercise. The second section consisted of 23 aspects of nursing. Students were asked to rate their own perception of their knowledge from very poor to excellent both before and after the exercise. The questions fell under four category headings as follows: (1) organisation and management of patient caseload, (2) clinical practice, (3) legal, ethical and professional issues and (4) communication. The final section consisted of three open ended

questions to complement the quantitative data collected. No demographic information was collected as this may have led to the identification of individual students. Quantitative data were analysed using non-parametric statistics in SPSS. Six focus group interviews lasting one and a half hours were conducted following each simulation. This included both participants that acted the role of student nurses as patients, and student nurses as staff nurses. Questions relating to the focus group were planned around students' perception towards simulation as a learning tool to prepare them for their role as staff nurse. For example, what did you learn from playing the role of a staff nurse? And what are your views on using simulation as a learning tool? Qualitative data was analysed using content analysis.

Results

The questionnaire data and the focus group data will be reported together under four common themes that emerged from the data as follows: Benefit, realism, stress and knowledge. These will be discussed in turn.

Benefit

Both quantitative and qualitative data obtained shows that simulation is beneficial and has a positive impact on students' confidence and their ability to perform their duties. Students responded positively to simulation increasing their confidence in their own ability. This was reflected by 90.5% of students that acted the role of nurses and 83% of students who acted the role of patients. Students as nurses stated they felt their 'confidence increased' when they achieved what they had to do. Students as patients stated they felt their 'confidence grew watching classmates performance'

Most students considered simulation to be an enjoyable and valuable way to learn. Students comments from the debriefing session were that simulation should be available across the four years of the programme. They felt it was a better way of learning than practicing individual clinical skills. One hundred percent of students acting the role of patients indicated they enjoyed the simulation exercise where as 85.7% of students acting the role of nurses enjoyed the exercise. Chi square analysis suggests that this difference is significant (x^2=4.045, df=1, p<.027). The majority of students would not only recommend the exercise to other students but would avail of the opportunity to do it again. Comments from patients and nurses were: *'more simulation please, please'*, *'great idea'* and *'brilliant'*.

The results of the first section are outlined in table 1.

Table 1: Benefit

Question	Nurses			Patients		
	n	Yes	No	n	Yes	No
Did you enjoy the simulation exercise?	21	18 (85.7%)	3 (14.3%)	47	47 (100%)	0
Has this simulation increased your confidence in your own ability?	21	17 (81%)	4 (19%)	47	39 (83%)	8 (17%)
Would you recommend this exercise to other students?	21	19 (90.5%)	2 (9.5%)	47	47 (100%)	0
If it could be facilitated, would you do the exercise again?	21	20 (95.2%)	1 (4.8%)	47	44 (93.6%)	3 (6.4%)

Realism

the paragraph should read "The majority of students acting as nurses (90%) and students acting as patients (97.8%) indicated that the simulation exercise reflected the reality of the clinical environment. Students found simulation to be a realistic challenge. Comments made were: *'very unrealistic in relation to what I experienced in clinical practice'*, *'compares to the real world'*, *'felt it was like working on the job'*, and *'felt the simulation exercise represented real life'*.

One student stated: *'workload unrealistic, too much for one hour, that would happen on a twelve hour shift'* in contrast another student commented: *'very quiet in simulation'*.

Students reported that the simulation exercise was beneficial in promoting their experience in their role as staff nurse. Students acting the role as nurses (90.5%) and students acting the role of patients (97.9%) commented: *'felt well prepared' and 'it would be helpful to students to have simulation before their rostered placement'*.

The qualitative data reinforces the findings in table 2.

Table 2: Realism

Question	Nurses			Patients		
	n	Yes	No	n	Yes	No
Do you feel that the exercise reflected the reality of the clinical environment?	20	18 (90%)	2 (10%)	46*	45 (97.8%)	0
Do you think the experience gained in this exercise will help you in your role as a staff nurse?	21	19 (90.5%)	2 (9.5%)	47	46 (97.9%)	1 (2.1%)

Stress

Table 3 indicates the stress experienced by the 2 different groups of students. For this question 75% of students who acted the roles of nurses found the exercise stressful whereas only 21.3% of students who acted the roles of patients found it stressful. Chi square analysis indicates that this difference is significant (x^2=15.091, df=1, p<0.0001). The qualitative data suggests that some students as nurses found the exercise stressful. One student commented: *'initially I found being watched intimidating'*. Some students stated: *'pressure to do everything right' and 'nervous'. Students as patients responded: 'not on top of us' and 'like the way they were (observers) at the door'*.

Both students as nurses, and students as patients, explain this further; Once they got into their role they reported: *'forgot about being observed'* and *'didn't know that they were there'*.

Table 3: Stress

Question	Nurses			Patients		
	n	Yes	No	n	Yes	No
Did you find the exercise stressful?	20	15 (75%)	5 (25%)	47	10 (21.3%)	37 (78.7%)

Knowledge

Overall student's ratings of their own level of knowledge increased after the exercise. In some instances they were lower which would indicate that

the exercise identified gaps in their knowledge that they were not aware of. Despite the fact that students felt some degree of stress, most students felt simulation was a valuable learning tool. They acknowledge that the exercise helped them to consolidate their knowledge in the area of clinical practice. Both students acting the role of patients and nurses stated: *'learnt a lot from simulation'*, *'increased level of knowledge'*, *'know more about patients conditions'* and *'at the right level for training in clinical practice'*.

In the questionnaire students were asked to rate their own perception of their knowledge from very poor to excellent both before and after the exercise. Mann Whitney U tests were used to compare how students who acted the roles of nurses and students who acted the roles of patients rated themselves, in relation to their perceived level of knowledge before the exercise. This indicated that there was no significant difference in students' perceived knowledge between the two groups. The 'after' ratings were also analysed using Mann Whitney U test. These indicated significant differences ($p < 0.05$) in a number of areas with students who acted the roles of patients having a significantly higher increase in perceived knowledge than those who acted the roles of nurses. They are as follows: Encouraging and facilitating independence and self-care ($p=0.001$), Attending to basic/fundamental nursing needs of patient/client ($p = 0.012$), Recognising professional and ethical dilemmas ($p = 0.018$), Patient/client education ($p = 0.009$) and Health promotion ($p = 0.001$). (See table 4: Knowledge)

Table 4: Knowledge, Mann Whitney U tests comparing nurses and patients for after questions

Question	U	P
Supporting colleagues and working as a team member	436.5	0.941
Managing resources efficiently and effectively	429.0	0.846
Maintaining patient safety	437.0	0.945
Dealing with unusual or unexpected events (problem solving)	413.0	0.906
Preparing patients for discharge	312.5	0.489
Preparing patients for procedures or theatre	391.5	0.638
Prioritising and managing an allocated workload	403.5	0.662
Delegating tasks	402.0	0.540
Questioning/challenging approaches to care appropriately	328.0	0.051
Encouraging and facilitating independence and self-care	251.5	0.001
Attending to basic/fundamental nursing needs of patient/client	292.5	0.012
Recognising changes in physical, emotional, social or psychological health status and taking appropriate action	374.0	0.216
Recognising professional and ethical dilemmas	302.0	0.018
Performance within level of training	404.0	0.434
Maintaining patient confidentiality	427.5	0.689
Adhering to local and national policies, procedures and guidelines	333.5	0.057
Maintaining patient privacy, dignity and respect	391.0	0.320
Gathering and recording relevant information	348.5	0.099
Communicating with colleagues including members of the multi-disciplinary team	420.0	0.605
Communicating with patients/clients, relatives	402.5	0.527
Conflict management	342.0	0.164
Patient / client education	283.0	0.009
Health promotion	233.5	0.001

Before and after scores for each group were analysed using Wilcoxon Signed Rank Tests. These indicated that overall there was a significant increase ($p < 0.05$) in perceived knowledge in 21 of the 23 areas examined. Analysis at nurse/patient level indicates that for students who acted the roles of patients, there was a significant ($p < 0.05$) increase in perceived knowledge in all areas. For students who acted the roles of nurses there was a significant increase ($p < 0.05$) in 11 of the 23 areas examined. The areas included are as follows: supporting colleagues and working as a team member, managing resources efficiently and effectively, maintaining patient safety, dealing with unusual or unexpected events (problem solving), prioritising and managing an allocated workload, recognising changes in physical, emotional, social or psychological, health status and taking appropriate action, recognising professional and ethical dilemmas, maintaining patient confidentiality, adhering to local and national policies, procedures and guidelines, gathering and recording relevant information, and communicating with colleagues including members of the multidisciplinary team.

In the focus groups students stated that they valued the opportunity to get feedback on the exercise and ask questions during the debriefing sessions. Students' comments were: *'found it useful to have queries answered to clarify and resolve issues that we were unsure of'* and *"Feedback was very beneficial to recognise the appropriate management of patients and highlight care that was overlooked"*

One student commented: *'feel it increases your knowledge when you find out what you have done is correct'*. All students stated that the simulation exercise allowed them to: *'reflect upon their work'* and *'think about what they were doing'*.

Discussion

The findings of this study supports the literature which indicates that simulation is a beneficial, valuable and an effective methodology to teach student nurses clinical and managerial skills.[12,24,25,26] Initially, coordinating a comprehensive simulated ward environment is time consuming and expensive. However, once it is set up, few resources are needed for future simulations making it a cost effective teaching tool. Due to the enormous time commitment it was not practical to utilize lecturing and clinical staff as patients. Additionally, to use actors would have been excessive from a cost point of view. The project team felt students could act the role as good as actors. For these reasons, the project team decided to utilize students as patients.

Student nurses were utilized as patients in the pilot simulation. No issues arose in relation to students acting as patients during the pilot or at the debriefing sessions. In fact, there was a positive response from both groups of students. Perhaps, both their familiarity with the hospital setting and their wide range of interactions with patients' behaviours and conditions helped them to emulate their role. Positive comments in the focus groups from students acting as patients were 'know what it's like to be a patient' and 'learned from watching my peers'. Students in the role of nurses didn't express any concern about being watched by their peers, who were patients, during the simulation.

Despite the fact that students felt stressed in the initial stage of the simulation exercise, they perceived the exercise reflected the reality of clinical practice and they believed that the experience gained in the exercise prepared them for their role as staff nurse. Humour was used while orientating students to the ward to help alleviate anxiety that students

might be experiencing.[27] Lecturers noted students started to relax and form relevant and meaningful dialogue during the simulation exercise. Students reported that once they began their role as staff nurses, their anxiety levels decreased. The observers reported that once the students settled down they progress very well. This reaffirms the findings of Nicol and Freeth[28] who identified that students took the simulation exercise seriously and at the start became anxious. Nevertheless, once the exercise got underway students became comfortable and performed well. Positive responses, to feeling prepared for clinical practice, arose because they were provided with an environment that gave them a sense of accomplishment, and that they had learned something practical and useful.[29] The majority of students said that not only would they recommend the simulation exercise to other students, but that they would also like more simulation-based training in their undergraduate nursing education.

The findings in this study identified that students found the debriefing session constructive to help them reflect on their own learning needs. Debriefing is a good medium for reflection on both strengths and weaknesses. Reflection offers immediate feedback which reinforces learning, encourages students to think critically and can help to discuss how to intercede in complex clinical situations. Thus, promoting improvement on their learning needs.

Students in this study perceived that they have consolidated previous nursing knowledge in the areas of organisation/management, clinical practice, communication and ethical/professional/legal issues. They specified that they felt an increase in confidence in their ability to perform in clinical practice. The findings of this study concur with Tompkins[30], Johnson[31], Kneebone RL, Scott W, Darzi A, et al.18 and Nazar and Andrews[32] who found that learning can occur within a safe environment that mimics what is actually done in real life without threat of imposing damage on patients. Simulation can promote the transference of knowledge gained in the simulation exercise to clinical practice,[29,24,12,31] therefore, promoting increased confidence and improved clinical and managerial skills. Applying knowledge learned in the simulation exercise to the real ward situation may help to bridge the theory-practice gap.

A limitation of this study was the convenience sample of the group of students from a single college. In future research it would be useful to extend this to varying groups of students. In addition to this, when running simulations, roles should be exchanged so that students who act the role of patients, can experience the role of nurses and visa versa. This would further enhance all students learning.

Conclusion

The evaluation by the students indicates that this simulation exercise represents a believable working environment which is corroborated by other studies in various countries. Therefore, we can conclude that simulation promotes deeper learning that is experiential and similar to clinical practice. This study took place during student's independent learning time attached to their clinical placements. It was not an alternative for practice placements but to complement other forms of training and instruction. The results of this study indicate that simulations are an immensely valuable approach to help senior nursing students acquire management skills. As a result of the positive findings we have incorporated simulation into our curriculum for the next academic year. It is hoped that the results of this study will help other educators to design and incorporate simulation into their programmes as an effective teaching strategy. Further research is essential to investigate the effect of simulation on care delivery. ■

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