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Impact of audio-visual storytelling in simulation learning experiences of undergraduate nursing students

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ABSTRACT

Background: Use of high fidelity simulation has become increasingly popular in nursing education to the extent that it is now an integral component of most nursing programs. Anecdotal evidence suggests that students have difficulty engaging with simulation manikins due to their unrealistic appearance. Introduction of the manikin as a 'real patient' with the use of an audio-visual narrative may engage students in the simulated learning experience and impact on their learning. A paucity of literature currently exists on the use of audio-visual narratives to enhance simulated learning experiences.

Objective: This study aimed to determine if viewing an audio-visual narrative during a simulation pre-brief altered undergraduate nursing student perceptions of the learning experience.

Design: A quasi-experimental post-test design was utilised.

Participants: A convenience sample of final year baccalaureate nursing students at a large metropolitan university.

Methods: Participants completed a modified version of the Student Satisfaction with Simulation Experiences survey. This 12-item questionnaire contained questions relating to the ability to transfer skills learned in simulation to the real clinical world, the realism of the simulation and the overall value of the learning experience. Descriptive statistics were used to summarise demographic information. Two tailed, independent group *t*-tests were used to determine statistical differences within the categories.

Results: Findings indicated that students reported high levels of value, realism and transferability in relation to the viewing of an audio-visual narrative. Statistically significant results ($t = 2.38, p < 0.02$) were evident in the subscale of transferability of learning from simulation to clinical practice. The subgroups of age and gender although not significant indicated some interesting results.

Conclusions: High satisfaction with simulation was indicated by all students in relation to value and realism. There was a significant finding in relation to transferability on knowledge and this is vital to quality educational outcomes.

1. Introduction

The use of high fidelity simulation in healthcare education is well established to the extent that the incorporation of high fidelity simulation is an integral component of any Bachelor of Nursing program (Foronda et al., 2013). Simulation has been shown to be an effective teaching method for select skills and knowledge gains (Foronda et al., 2013). However, a critique of high fidelity manikins in healthcare education relates to their unrealistic appearance (Barry et al., 2012) with some students unable to engage and relate with the inanimate object in an authentic manner. Literature relating to nursing student engagement with manikins is, however, largely anecdotal (Power et al., 2016). Evidence suggests that engagement with learning results in improved knowledge retention and a deeper understanding of subject matter, which may be utilised for future practice (Wolff et al., 2015). The creation of an authentic and believable simulated learning experience that engages the learner is therefore optimal for maximal learning (Walsh and Van Soeren, 2012).

This study developed a learning and teaching strategy that designed to increase realism and subsequent engagement with the simulation experience among undergraduate nursing students through the incorporation of audio-visual (A-V) narratives. A-V narratives are short audio-visual productions (Guise et al., 2012) and in this case, with actors portraying aspects of a patient journey in a clinical situation. The use of A-V techniques and resources have been identified as highly effective teaching strategies that are frequently used in health education

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(Al-Shaer et al., 2011; Fero et al., 2010; Mcconville and Lane, 2006; Volandes, 2007). Ironside (2006) asserts that the use of narratives contributes to a deeper understanding of a situation or scenario subsequently leading to the ability to use and incorporate this learning in future practice. McAllister et al. (2013) further supported the use of narratives suggesting this methodology was facilitative in understanding patient contexts. A-V narratives are an effective framework to support deep learning (Moon and Fowler, 2008).

Recent research by Power et al. (2016) examined the use of A-V vignettes prior to completing a simulation experience to improve the participant learning experience (Power et al., 2016). This qualitative study reported increased student engagement with the manikin and improved student reflection on personal values and prejudices (Power et al., 2016). It also indicated an increased ability for students to suspend their disbelief, feel connected and be able to approach the manikin in a more understanding and empathetic fashion (Power et al., 2016). Connection with the manikin was also a finding supported by Lehtola (2007) who asserted that a narrative story improved student engagement and understanding of the context in which a simulation took place. The use of named characters provided credibility to the simulated experience and allowed students to relate to the situation and remember the learnings (Lehtola, 2007).

This study drew on the principles of narrative pedagogy in nursing to increase student understanding of the patient experience. Walsh (2011) explains that this method is different to storytelling, which is a recounting of sequence of events. Rather, the narrative is the way in which the story is told, therefore, manipulation of the context impacts on perception and understanding of the situation (Walsh, 2011). The A-V narrative was a five-minute recording using real actors to portray the patient, patient's wife and staff caring for the patient. The narrative comprised three short segments: the patient with his wife in a pre-admission clinic, the patient and his wife at home discussing concerns and, post procedure with the theatre nurse giving patient handover to the ward nurse. The context of the patient as a real world person with problems and concerns affecting family members designed to influence the understanding of the patient's story and the meaning that students attached to it (Diekelmann, 2001).

This study investigated how using an A-V narrative incorporated into the pre-briefing of a clinical simulation, influenced third year nursing students' perceptions of the simulation experience. Comparisons were made of student perceptions of the experience and perceived transferability, value and realism of learning between two groups - those who viewed an A-V narrative prior to undertaking the simulation and those who participated in a standard verbal pre-briefing. A review of relevant literature revealed limited research in the areas of narratives in simulation and this prompted this research.

2. Methods

The aim of the A-V narrative was to transform the artificial simulation environment to a real world representation of a clinical patient problem and context to facilitate active and engaged learning, and assist in connecting theory to practice for third year baccalaureate nursing students.

Specifically, overall aims of completing this study were:

1. Determine student perceptions of A-V narrative pre-brief information in simulated learning experiences and identify variances across subgroups of third year baccalaureate nursing students.
2. Determine if the implementation of A-V narrative pre-briefing in a simulation experience altered student perceptions of their ability to transfer learning to the clinical area.

2.1. Setting

This study was conducted across two campuses of a School of Nursing in a large metropolitan university. The school offers a Bachelor of Nursing program and three double degrees (nursing/behavioural science, nursing/paramedic science and nursing/public health).The Clinical Simulation Centre (CSC) at both campuses has purpose-built rooms for pre and debriefing of students prior to and after a clinical simulation. The CSCs at both campuses have been designed to simulate a clinical care area and include a fully computerised high fidelity human 'patient' in a hospital style setting, with a viewing room and adjacent facilitator control room. Simulations are undertaken by students in groups of eight, with four being active participants and four students being observers. Simulations require students to complete some pre-reading in relation to the scenario. The simulation timeframe is a 60-minute period comprising of a 10-minute pre-brief, followed by 20 min of simulation. Students are guided through a 30 min debrief session conducted by a facilitator who is a registered nurse and trained in delivery of clinical simulation.

2.2. Participants

The population for this study was baccalaureate students enrolled in nursing degrees (either single or double). The study included a convenience sample of third year nursing baccalaureate students enrolled in a clinical capstone unit in semester 2, 2016. The simulation and debriefing sessions are a standard, non-assessed learning experience within this clinical capstone unit and all students enrolled in this unit were invited to participate in the study. Students were informed that participation was voluntary and that non-participation would in no way impact on their grade for the unit.

2.3. Ethics

Ethical approval for this study was obtained through the University Human Research Ethics Committee, approval number 160000069. All participants were emailed a participant information package. Participant information sheets were also available on the day of simulation. Return of completed surveys implied consent to participate in the study.

2.4. Design

This study used a quasi-experimental design and collected data using a post-test questionnaire. The instrument used was the Student Satisfaction with Simulation Experiences instrument (Abdo & Ravert). The questionnaire measured perceptions of value, realism and transferability of the experience with good reliability (Abdo & Ravert).

2.5. Procedure

All undergraduate nursing students in a second semester clinical capstone unit in 2016 were invited to participate in the study through announcements and emails delivered via the learning management platform. Prior to the simulation, students' self-allocated to a simulation group as per standard procedure. Groups were then randomised using a computer generated program to either the control group (standard pre-brief) or intervention group (A-V narrative pre-brief). The intervention group watched and listened to an A-V recording of the patient's history, interaction with an admitting nurse, discussions between the patient and his wife and a post procedure handover by the nurse caring for the patient. The control group undertook verbal pre-briefing as per standard practice, which was a verbal handover of the patient condition. All students then participated in the same high fidelity simulation and subsequent debriefing.

The simulation was the same scenario for both control and intervention groups. The patient scenario involved a 65-year-old man with a history of diabetes and increasingly frequent episodes of chest pain, admitted for an elective coronary angioplasty. The students were

required to work through a range of learning activities, which were discussed with the students at the commencement of the simulation scenario.

The preparatory pre-reading for the simulation was the same for both groups and was available on the learning management platform. Following the simulation debrief all students were asked to complete a post-test questionnaire. Simulation facilitators included eight sessional academics all of whom had previous experience in facilitating clinical simulation education sessions who had all been provided with a one-hour education session of the study aims and requirements.

2.6. Data Collection

The post-test questionnaire asked two demographic questions (age and gender) to determine if there were any differences in these subgroups of students. An adaptation of the evaluative tool 'Student Satisfaction with Simulation Experiences' (Feingold et al., 2004; Abdo and Ravert, 2006) was used. This study used 12 items that related to the three subscales of: the ability to transfer skills learned in simulation to the real clinical world (3 questions), the realism of the simulation (3 questions) and the overall value of the learning experience (6 questions) (Feingold et al., 2004). These 12 items were all scored on a 4-point Likert scale with response choices ranging from 4 = strongly agree to 1 = strongly disagree to obtain the extent of student-item agreement with response choices (Feingold et al., 2004). Permission to adapt and use this tool was obtained from the authors. The questionnaires were anonymous and completed by all students (intervention and control) on a hard paper copy in an allocated room adjacent to the simulation room and collected in a sealed returns box to ensure confidentiality of responses.

2.7. Data Analysis

All data were statistically analysed using the software package Statistical Package for the Social Sciences (SPSS 23.0). Descriptive statistics were used to summaries demographic information including the mean and standard deviations. The categories of value, realism and transferability were scored as per guidelines (Feingold et al., 2004). Two tailed, independent group *t*-tests were used to determine any statistical differences within the categories of value, realism and transferability in the intervention and control groups.

3. Results

A total of 442 students were enrolled in the baccalaureate nursing semester two clinical capstone unit in 2016 across the two campuses. Of these, 418 students attended the simulation and 385 students completed the survey, giving a response rate of 92% of students that attended the simulation experience. The demographics of the two groups were similar and are shown in Table 1.

Eighty-one percent of participants were female and the 20–25 year age group was the largest comprising 55% of the cohort. There were no significant differences between the two groups.

Ninety per cent or more of participants indicated their agreement with the realism questions i.e. the scenario recreated a real-life situation, the simulator space resembled a health care setting and the simulator model provided a realistic patient simulation. Ninety-five percent or more of participants indicated their agreement with the value questions i.e. the scenario adequately tested technical and clinical decision making skills, the simulation was a valuable learning experience, the simulation reinforced learning objectives of this course, that participants believed they received adequate feedback and that the overall experience enhanced their learning. Ninety per cent or more of participants indicated their agreement with the transferability questions i.e. the simulation increased participant confidence about going into the real clinical setting, the simulation improved clinical competence and prepared the student to perform in the "real-life" clinical setting.

Table 1
Demographics of student groups (n = 385).

	Control *n* (%)	Intervention *n* (%)	Total *n* (%)
Female	153 (80.5%)	168 (87.5%)	321 (84%)
Male	37 (19.5%)	24 (12.5%)	61 (16%)
Age groups			
< 20 years	4 (2.2%)	7 (3.7%)	11 (3%)
20–25 years	103 (56.6%)	102 (54%)	205 (55.3%)
26–30 years	43 (23.6%)	32 (16.9%)	75 (20.2%)
> 30 years	32 (17.6%)	48 (25.4%)	80 (21.6%)

Table 2
Subscale values.

	Intervention	Control	Total	*t*	*p*
	Mean (SD)				
Value subscale	3.41 (0.43)	3.38 (0.44)	3.40 (0.43)	0.66	0.51
Realism subscale	3.29 (0.46)	3.24 (0.49)	3.27 (0.48)	1.18	0.24
Transferability subscale	3.29 (0.47)	3.17 (0.53)	3.23 (0.50)	2.38	0.02

While there was no statistical difference between the two groups in regards to value and realism, there was a statistically significant difference between the two groups in relation to transferability (see Table 2).

The mean scores of the subscales of value, realism and transferability generally increased across the age groups with no significant results in relation to the intervention in these categories in the below 20 year old age group. The 20–25 year age group indicated that, as well as transferability, realism showed an increase in the intervention group although not quite reaching statistical significance. In the 26–30 year age group, results indicated that subscale value showed an improvement although again did not reach statistical significance (See Table 3).

When comparing gender, it was of interest to note that the mean overall scores for all categories were higher for males than for females with and increased difference in the change of the mean scores within each subgroup (see Table 4).

4. Discussion

Satisfaction of participants in this study was rated highly in relation to value, realism and transferability of the simulated experience this study in comparison to a previous study. In a study by Feingold et al. (2004), scores of 3.04 ± 0.44 for the value subscale, 2.83 ± 0.43 for realism subscale and 2.52 ± 0.63 for the transferability subscale were reported, although this was not an interventional study. This indicates that participants in this study found the simulation to be of value, realistic and transferable to practice irrespective of the intervention. This was also indicated in the numbers of students who attended the non-compulsory high-fidelity simulation experience. Improved technological, academic knowledge and experience in the delivery of high fidelity simulation that has occurred since 2004 may have attributed to high satisfaction scores.

Evidence suggests that perceived lack of value in learning and teaching activities can lead to loss of interest in the learning activity, disengagement and subsequent disenchantment with the experience (Cioffi, 2001; Tze et al., 2016). In this study, the high score overall of value of the simulation indicated that participants believed that the simulation tested their technical skills, tested clinical decision-making, reinforced objectives of the course, received adequate feedback regarding their performance, was a valuable learning experience and enhanced their learning. While there was no significant difference between the two groups (intervention and control), there was a small rise

Table 3
Subgroup (age) comparisons.

		Intervention	Control	Total	*t*	*p*
		Mean (SD)				
< 20 years	Value	3.28 (0.38)	3.04 (0.42)	3.18 (0.39)	0.94	0.38
	Realism	3.24 (0.32)	3.17 (0.58)	3.21 (0.40)	0.27	0.79
	Transferability	3.10 (0.50)	2.83 (0.58)	3.00 (0.52)	0.79	0.45
20–25 years	Value	3.38 (0.43)	3.38 (0.39)	3.38 (0.41)	0.08	0.94
	Realism	3.31 (0.47)	3.17 (0.51)	3.24 (0.49)	1.92	0.06
	Transferability	3.27 (0.43)	3.12 (0.53)	3.20 (0.48)	2.21	0.03
26–30 years	Value	3.38 (0.43)	3.38 (0.39)	3.42 (0.44)	1.83	0.07
	Realism	3.31 (0.47)	3.17 (0.51)	3.30 (0.47)	0.07	0.95
	Transferability	3.27 (0.43)	3.12 (0.53)	3.27 (0.52)	2.18	0.03
> 30 years	Value	3.44 (0.46)	3.44 (0.53)	3.44 (0.49)	− 0.00	1.00
	Realism	3.29 (0.47)	3.35 (0.51)	3.32 (0.48)	− 0.58	0.57
	Transferability	3.32 (0.51)	3.28 (0.59)	3.30 (0.54)	0.29	0.77

Table 4
Subgroup (gender) comparisons.

		Intervention	Control	Total	*t*	*p*
		Mean (SD)				
Male	Value	3.45 (0.49)	3.43 (0.38)	3.44 (0.42)	0.19	0.85
	Realism	3.39 (0.53)	3.28 (0.45)	3.32 (0.48)	0.88	0.38
	Transferability	3.47 (0.47)	3.18 (0.48)	3.30 (0.49)	2.33	0.02
Female	Value	3.41 (0.42)	3.36 (0.45)	3.38 (0.44)	0.91	0.36
	Realism	3.28 (0.46)	3.23 (0.50)	3.26 (0.48)	0.97	0.33
	Transferability	3.27 (0.46)	3.16 (0.55)	3.21 (0.51)	1.87	0.06

in the score for the intervention group and would suggest that incorporation of the A-V in the pre-brief may have contributed to the value that the participants saw in the simulation. This methodology is therefore worthy of further consideration. Creative strategies in simulation that will foster engagement and contribute to the overall value of simulated learning experience are areas for future exploration (Levett-Jones et al., 2015).

Our efforts to enhance perceived realism within the simulation were supported by an increase in results of the realism sub-scale in the study. Although there was a small but non-significant improvement in the control scores to intervention scores, the overall scores for realism were quite high. This suggests that participants believed the simulation recreated a real-life situation, the simulator resembled a real health care setting and provided a realistic patient experience therefore indicating that audio-visual pre-brief did not add to what the participants believed was already a realistic situation.

Participants in this study were third year baccalaureate nursing students in a clinical capstone unit who had all participated in multiple simulation experiences as well as off campus clinical placements during their course. These experiences may have increased the participants' ability to relate to the simulation and contextualise the scenario better than a less experienced cohort.

A continuing theme in nursing education relates to transferability of learning from a simulated setting to the clinical area (Kirkman, 2013; Rutherford-Hemming, 2012). A significant outcome was noted in this study between the control and intervention groups in relation to the transferability sub-scale questions. This indicates that participants who undertook the intervention believed the simulation experience significantly increased their knowledge going into the real clinical setting, that interaction with the simulation improved clinical competence and that the simulation prepared them to perform in a “real-life” clinical setting.

While high-fidelity simulation has been used and supported successfully into health care programs, this study has address the limited research area of the use of narratives in simulation. By incorporating an A-V narrative into the pre-briefing of a clinical simulation, third year nursing students' perceptions of the simulation experience were increased.

4.1. Limitations

The participants were third year baccalaureate nursing students from one university in Australia and the findings may not be generalisable to other universities or countries. This study was undertaken as part of a course and was restricted by time constraints, which therefore limited the breadth and depth of data, collected.

4.2. Future Directions

This study presents opportunities to build on the findings for future research and the collection of both quantitative and qualitative data about use of A-V narratives in high-fidelity simulations. Further research of this nature with first year baccalaureate nursing students who have had minimal experiences and opportunity to contextualise the simulation scenario may reveal varied results and increase the significance of group comparisons. Further research in this area should also be explored in other health professional education courses where simulations are also widely used.

5. Conclusion

This research has indicated high satisfaction results from third year nursing baccalaureate students in the sub-scale scores of value, realism and transferability in relation to their simulation experience. The results of the use of A-V narrative did not indicate any significant differences in the two subscale areas of value and realism; however, this is likely due to the already high levels of overall satisfaction with high-fidelity simulated learning experiences.

The mean scores did increase across all sub-scales of the intervention groups and although not statistically significant are of interest to investigate further and supports the use of high-fidelity simulation as a valuable inclusion for students in baccalaureate nursing courses. Of interest was the significant outcome in relation to the perceived transferability of learning from the simulation to the clinical setting. The use of an A-V narrative depicting a real-life patient story that led into the simulation experience was an important part of fostering students' ability to identify how learning could be translated from the simulation experiences into practice. The results of the transferability subscale between subgroups (control and intervention) indicates that further development of simulations should consider the makeup of the participant groups. The transferability, value and realism of the A-V narrative simulation may also become more evident to students once they are in the clinical setting and able to apply knowledge gained from this experience. Further studies using the A-V narrative evaluation

incorporating collection of qualitative data and post off-campus clinical experience reflection on the simulation would be valuable in expanding this area of research.

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Author Contributions

All authors made substantial contributions to: 1. The conception and design of the study, the acquisition of data and, analysis and interpretation of data, 2. Drafting the article and revising it critically for important intellectual content, and 3. Final approval of the version to be submitted.

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