Enhancing Health Care Student Inter-Professional Learning Through a Pilot Simulation Ward Experience Using Mask-Edtm(KRS Simulation)

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Abstract

Pre-clinical training is traditionally conducted in 'siloed' disciplines limiting inter-professional learning (IPL) opportunities. A pilot using Mask-Ed^{TM} technology was used to simulate an authentic IPL experience for health-care students and enhance the IPL experience of students in a preclinical simulation-training program. A multidisciplinary, simulated ward experience was conducted using Mask-Ed^{TM}. Students completed pre- and post-pilot Interprofessional Collaborative Competencies Attainment Surveys (ICCAS). A focus group was conducted to explore participant IPL experience and pre-clinical skill development. Statistically significant improvements were found in all six domains of the ICCAS (collaboration, roles and responsibilities, patient centred approach, conflict management and team functioning). Focus group analysis generated three themes: authenticity, mistakes are ok and learning. This pilot study suggests that Mask-Ed™ simulation is an effective method to teach IPL to health students.

1. Introduction

Clinical simulation creates realistic opportunities for students to enhance contextual learning through experience as part of their pre-clinical training (Dornan, Littlewood, Margolis, Scherpbier, Spencer, & Ypinazar, 2009). As the Australian health care system is characterised by a diverse multidisciplinary workforce, the need to educate health students in an inter-professional way is essential (Consan Consulting, 2012; Sansan-Fisher, Baitch, & Teterson, 2005). A criticism of health education in Australia is that it has adopted a siloed education model, thus eliminating the opportunity to encourage multidisciplinary interaction (Consan Consulting, 2012; Sansan-Fisher, Baitch, & Teterson, 2005). In addressing this criticism, many educators have designed pre-clinical training utilising simulation tools such as: clinical skills laboratories and modelled props (including manikins, fake foods/equipment) (Ewertsson, Allvin, Holmstrom, & Blomberg, 2015). However, much of this pre-clinical training occurs within disciplines with minimal opportunity for multiple disciplines to be truly involved in the simulation of patient care (Ewertsson, Allvin, Holmstrom, & Blomberg, 2015). There is a need to develop educational opportunities that allow multiple health professionals to learn how to work together to enable the best possible patient outcomes. If students of different health disciplines can learn together to care for patients then they are more likely to appreciate the roles other disciplines play in the care of patients (Frost, Isbel, Kellett, & Lawlis, 2017).

Inter-professional Learning (IPL) has been identified as a practical educational approach to reduce the gap between 'siloed' pre-clinical education and real world IPL clinical application (Consan Consulting, 2012; Hobgood, Sherwood, Frush, Hollar, Maynard, & Foster, 2010; Lapkin, Levett-Jones, & Gilligan, 2012; Mitchell, Groves, Mitchell, & Batkin, 2010; Sansan-Fisher, Baitch, & Teterson, 2005; Wenrich, Jackson, Wolfhagen, Ramsey, & Scherpbier, 2013; World Health Organization, 2010). The Centre for the Advancement of Inter-Professional Education (CAIPE) defines IPL application when "two or more professions learn with, from and about each other to improve collaboration and the quality of care" (Centre for the Advancement of Inter-Professional Education, 2002). Outlined by the World Health Organisation (WHO), effective IPL should incorporate key competencies, such as; communication, collaboration, roles & responsibilities, collaborative patient/family-centred approach, conflict management/resolution and team functioning (World Health Organization, 2010). Addressing these competencies emphasises the importance of teamwork, promotes an understanding of health professional interactions in the workplace and reinforces individual disciplinary roles within real workforce dynamics (Mitchell, Groves, Mitchell, & Batkin, 2010; World Health Organization, 2010). Therefore, the importance of integrating IPL to prepare health students for real world application is widely acknowledged (Hobgood, Sherwood, Frush, Hollar, Maynard, & Foster, 2010; Lapkin, Levett-Jones, & Gilligan, 2012; Mitchell, Groves, Mitchell, & Batkin, 2010; Sansan-Fisher, Baitch, & Teterson, 2005; World Health Organization, 2010). Furthermore, IPL has been identified as a key strategy required in institutional reform to achieve optimal health and patient care (Mitchell, Groves, Mitchell, & Batkin, 2010; World Health Organization, 2010).

Simulation is widely used as a pre-clinical and IPL tool for health students (Ewertsson, Allvin, Holmstrom, & Blomberg, 2015; Frost & Reid-Searl, 2015; Reid-Searl, Levett-Jones, Cooper, & Happell, 2014) and can be defined as an activity in which real life scenarios are replicated, in order to contextualise learning experiences (Centre for the Advancement of Inter-Professional Education, 2002; Ewertsson, Allvin, Holmstrom, & Blomberg, 2015). Mask-Ed™(KRS simulation) (henceforth Mask-Ed™) is a simulation technique that can be used to simulate authentic situations (Frost & Reid-Searl, 2015; Reid-Searl, Levett-Jones, Cooper, & Happell, 2014) through the use of silicone props to create realistic interactive characters (Reid-Searl, 2011). The educator within the Mask is able to coach the students and prompt learning moments by using the Mask-Ed™ character as a platform for learning. The interactive and spontaneous nature of Mask-Ed™ allows a realistic portrayal of a ward environment to be created.

Despite the need to include pre-clinical IPL education for health students, there is limited evidence in regards to the effect pre-clinical simulation has on IPL (Consan Consulting, 2012;

Ewertsson, Allvin, Holmstrom, & Blomberg, 2015; Frost & Reid-Searl, 2015; Lapkin, Levett-Jones, & Gilligan, 2012; Sansan-Fisher, Baitch, & Teterson, 2005; Wenrich, Jackson, Wolfhagen, Ramsey, & Scherpbier, 2013; World Health Organization, 2010). Mask-Ed has been studied in isolated disciplines such as nursing (Kable, Arthur, Levett-Jones, & Reid-Searl, 2013), physiotherapy (Australian Physiotherapy Association, 2014) and radiography (Reid-Searl, Bowman, McAllister, Cowling, & Spuur, 2014) and evidence suggests that as a technique Mask-Ed™ promotes communication and can be used to prepare students for clinical practice (Frost & Reid-Searl, 2015). Despite the evidence in single disciplines, to our knowledge, Mask-Ed™ has not been previously used in IPL. The aim of the pilot project was to explore the use of Mask-Ed™ in an inter-professional environment.

This led to three research questions:

1. Is Mask-Ed an effective teaching method for interprofessional learning?
2. What are the experiences of students as they use Mask-Ed in inter-disciplinary learning?
3. Can Mask-Ed™ facilitate health students understanding of other professions roles in the care of an older adult?

2. Methods

A. *Mask-Ed^TM simulation*

During this pilot simulation, Mask-Ed^TM was used to create realistic characters, with lifelike medical profiles, requiring treatment by a team of health professionals in a simulated clinical setting. This pilot capitalises on the strength of Mask-Ed^TM whereby Mask-Ed^TM characters are health professionals (experts in the mask) who have undertaken training in the technique, who use their character to 'coach' the students through the simulation scenario.

The IPL approach is attained through simulating health professional collaboration to improve the quality of patient-centred care to the Mask-Ed™ character, while implementing scenarios addressing the following key competencies: communication, collaboration, roles & responsibilities, collaborative patient/family-centred approach, conflict management/resolution and team functioning (World Health Organization, 2010).

Mask-Ed^TM was used to provide IPL pre-clinical training to nursing, dietetics and occupational therapy students using a simulated acute care ward with two patients. The two characters 'Hilda'(Figure 1) and Betty'(Figure 2) were developed specifically to have care needs from each of the student groups and to facilitate an opportunity for the students to work together. The characters of 'Hilda' and 'Betty' were developed by the individual educators within the Mask, as per the Mask-Ed™ technique. Specialist educators from each of the disciplines represented in the study (nursing, dietetics and OT) assisted in the preparation of the scenarios used in the ward environment. Additionally a video was used to show the home circumstances of 'Hilda', this assisted the OT students specifically. Prior to students entering the simulated acute ward, they were given hand over by a staff member acting as a nurse unit manager.
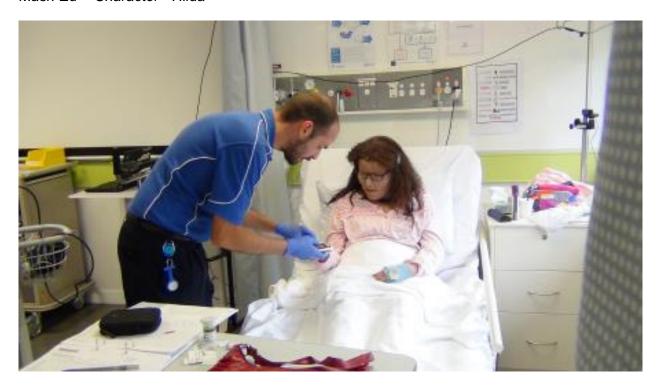
Figure 1:

Mask-Ed™ Character - Hilda

Figure 2:

Mask-Ed™ Character - Betty

The pilot occurred over two days in August 2016, shown in Table 1. Ten students were divided into the two sessions on day one. As there were only two Dietetic students they were involved in both sessions. In addition to the two Dietetic students, each session had two Nursing and two Occupational Therapy students. On day two, the groups participated in a simulated case conference facilitated by a simulated medical practitioner. During the case conference each profession was asked to summarise their involvement with each patient including what interventions they did and what they planned to do. Additionally, on day two, both groups were required to attend a simulated family meeting where the character 'Betty' or 'Hilda' and their family members attended to discuss future care needs and the role students undertook in the care of the patient. Finally, on Day 2 a focus group was conducted during which participants discussed their experience and opinions regarding the simulation, IPL opportunity and pre-clinical learning skill development. The study was approved by the University of Canberra Human Research Ethics Committee (HREC 16-118). Informed written consent and media consent was obtained from all participants prior to the commencement of the pilot program.

Table 1:
Summary of pre-clinical IPL pilot program

	Group Session 1	Group Session 2
Character	Betty	Hilda
Day 1, Disciplines involved	2 x Nursing, 2 x Occupational Therapy, 2 x Dietetics	2 x Nursing, 2 x Occupational Therapy, 2 x Dietetics (same students as Scenario 1)
Session 1: AM Group A	Priorities of care for the session: Medication required OT initial interview Vitals Nurse prn meds OT kitchen assessment booked, patient needs medication prior to the assessment or becomes anxious and short of breath	Priorities of care for the session: Medication required Personal hygiene needs should be addressed. Dietitian assessment and education– diabetes, constipation from opiods GORD Breakthrough Pain Wound dressing
Session 2: PM Group B	Priorities of care for the session: Episode of shortness of breath Can have schedule 8 medication as required During interview with dietitian oxygen becomes detached Intravenous antibiotics due	Priorities of care for the session: Toileting OT interview Regular pain medication due at 2pm Pain assessment required OT equipment Hypoglycaemia
Family conference	Attended by Betty's daughter (actor 1) and the multi disciplinary team from both groups	Attended by Hilda's Daughter (actor 2) and the multi disciplinary team from both groups
Case conference	Health care team	Health care team

B. Participant recruitment

Students enrolled in three degree programs were invited to participate in the pilot simulation by email: Bachelor of Nursing, Master of Nutrition and Dietetics; and Master of Occupational Therapy. Participation was on a volunteer basis. Involvement in the pilot simulation was not linked to an assessment item within these programs. Students who volunteered to participate had either not undertaken a clinical placement or had been on clinical placement for 4 weeks or less.

C. Data Collection

The students IPL and pilot simulation experiences were assessed through two surveys and a focus group. Survey 1, completed after students had read the character's medical file and prior to engaging with the Mask-Ed™ patient, required students to rank the importance of health disciplines (nursing, physiotherapy, occupational therapy, dietetics, speech pathology, pharmacy, exercise physiology and psychology) in the treatment of 'Betty' and 'Hilda' using a Likert scale (0=not important, 1=maybe important, 2=neutral, 3=slightly important, 4=important, 5=very important). This survey was developed by the researchers, piloted and has been published elsewhere (Frost, Isbel, Kellett, & Lawlis, 2017). Survey 2 comprised a pre and post Interprofessional Collaborative Competencies Attainment Survey (ICCAS)© (Archibald, Trumpower, & MacDonald, 2014).The ICCAS survey has been developed in two languages as a valid tool for IPL assessment where participants rate statements, directly related to the six key IPL competencies (communication, collaboration, roles and responsibilities, collaborative patient/family-centred approach, conflict management/resolution and team functioning), according to a Likert scale (1=strongly disagree; 2=moderately disagree; 3=slightly disagree; 4=neutral; 5=slightly agree; 6=moderately agree; 7=strongly agree and 8=Not Applicable) (Archibald, Trumpower, & MacDonald, 2014). At the completion of the pilot simulation and group meetings, students participated in a focus group, facilitated by TL and JK. Focus group questions explored the IPL experience and impact on student learning in a pre-clinical setting.

D. Data Analysis

Quantitative data was analysed using the statistical analysis software for sciences IBM-SPSS Statistics (IBM Corp ©, 2015). A Shapiro-Wilk's test showed that the data were not normally distributed. Basic descriptive analysis, including median and range was conducted. A Wilcoxin Signed ranked test was used to determine differences between the pre- and post ICCAS survey categories and statements (Archibald, Trumpower, & MacDonald, 2014), and survey 1 responses. Significance was determined when $P<0.05$. Internal consistency was assessed using Cronbach alpha. The focus group was recorded and transcribed verbatim for qualitative analysis. Inductive thematic analysis, using NVivo 11.3.2, was used to analyse the qualitative data based on Braun and Clarke's method (Braun & Clarke, 2006). This process is an iterative bottom up (Frith & Gleeson, 2004) approach where the data is strongly linked to the themes that are generated, and is used when a specific research question is being addressed, such is the case in this research. TL conducted the quantitative analysis. SI and TL independently conducted the qualitative analysis and discussed initial codes and themes to refine. SI checked the quantitative analysis. JF and JK conducted an additional check of all analysis.

3. Results

Ten health students, Nursing (n=4/10), Occupational Therapy (n=4/10) and Dietetics (n=2/10), participated in simulations, surveys and a focus group. Students were either: third year undergraduates (n=4/10), or postgraduate students (n=2/10 first year; n=4/10 second year). Eight students were enrolled as domestic students and two students were enrolled as international students. Nine students were female and 8/10 were aged between 18-34 years. Prior to the Mask-Ed™ pilot simulation, one student indicated that they had prior work experience in a clinical health setting.

According to the Wilcoxin Signed ranked test the post-test ranks were not statistically higher that the pre-test ranks in all categories. Thus, the students' understanding of individual health profession roles in the treatment of both 'Betty' and 'Hilda' did not vary significantly pre and post survey as shown in Table 2.

Table 2:
Student understanding of individual health profession roles in the treatment of 'Hilda' and 'Betty'

Statement#	Pre-Median (IQR)	Post-Median (IQR)	Wilcoxon Signed Ranks significance
Hilda			
Nursing	5.00 (0.00)	5.00 (0.00)	0.317
Physiotherapy	5.00 (0.00)	5.00 (0.00)	0.317
Occupational Therapy	5.00 (0.00)	5.00 (0.00)	1.000
Dietetics	4.00 (2.00)	4.50 (1.00)	0.180
Speech Therapy	0.00 (3.00)	1.00 (3.75)	0.577
Pharmacy	5.00 (1.00)	4.50 (3.00)	0.336
Exercise Physiology	4.00 (2.00)	2.00 (1.00)	0.066
Psychology	4.00 (2.00)	3.00 (3.00)	0.461
Betty			
Nursing	5.00 (0.00)	5.00 (0.00)	1.000
Physiotherapy	3.00 (3.00)	4.00 (3.00)	1.000
Occupational Therapy	5.00 (1.00)	5.00 (1.50)	0.414
Dietetics	5.00 (1.00)	5.00 (0.50)	1.000
Speech Therapy	3.00 (3.25)	1.00 (3.50)	0.102
Pharmacy	5.00 (0.00)	5.00 (1.00)	1.000
Exercise Physiology	3.00 (2.25)	2.00 (1.00)	0.102
Psychology	4.00 (1.00)	5.00 (0.50)	0.157

Key: # Likert Scale: 0 = not important, 1 = maybe important, 2 = neutral, 3 = slightly important, 4 = important, 5 = very important.

A. Interprofessional Collaborative Competencies Attainment Survey

All students n=10 (100%) completed the pre and post ICCAS surveys. Internal consistency (Cronchbach's alpha) coefficients were high at 0.94 and 0.93 for the pre and post survey respectively. As shown in Table 3, a Wilcoxin Signed ranked test indicated that the post-test ranks were statistically higher than the pre-test ranks in all categories: communication Z= 2.67, p=0.008; collaboration Z= 2.37, p=0.018; roles and responsibilities Z= 2.81, p=0.005; collaborative patient/family-centred approach Z= 2.32, p=0.020, conflict management/resolution/team functioning Z= 2.67, p=0.008.

Table 3:
ICCAS Pre & Post simulation Comparison

Statement#	Pre-Median (IQR)	Post-Median (IQR)	Wilcoxon Signed Ranks significance
Communication	**5.10 (1.65)**	**6.30 (1.10)**	**0.008**
1. Promote effective communication among members of an interprofessional (IP) team*	5.00 (1.25)	6.00 (1.00)	0.016
2. Actively listen to IP members' ideas and concerns	5.50 (1.50)	6.50 (1.00)	0.026
3. Express my ideas and concerns without being judgemental	5.00 (2.25)	6.50 (1.25)	0.011
4. Provide constructive feedback to IP team members	4.50 (2.25)	6.00 (2.25)	0.020
5. Express my ideas and concerns in a clear, concise manner	5.00 (2.25)	6.00	0.026
Collaboration	**4.80 (2.10)**	**6.70 (1.25)**	**0.018**
6. Seek out IP team members to address issues.	5.00 (0.05)	6.50	0.098
7. Work effectively with IP team members to enhance care	5.00 (2.25)	6.50	0.016
8. Learn with, from and about IP team members to enhance care	5.00 (3.25)	7.00	0.017
Roles and Responsibilities	**4.80 (1.10)**	**6.50 (1.00)**	**0.005**
9. Identify and describe my abilities and contributions to the IP team	5.00 (1.00)	7.00	0.009
10. Be accountable for my contributions to the IP team	5.50 (1.00)	7.00	0.027
11. Understand the abilities and contributions to the IP team	5.00 (2.00)	7.00	0.011
12. Recognise how others' skills and knowledge complement and overlap with my own	5.00 (1.25)	6.00	0.007
Collaborative Patient/Family-Centred Approach	**5.10 (1.75)**	**7.00 (1.20)**	**0.020**
13. Use an IP team approach with the patient** to assess the health situation	5.00 (1.75)	7.00	0.020
14. Use an IP team approach with the patient to provide whole person care	5.00 (2.50)	7.00	0.016
15. Include the patient/family in decision-making	6.00 (1.00)	7.00	0.131
Conflict Management/ Resolution and Team functioning	**5.50 (1.75)**	**6.80 (1.20)**	**0.028**
16. Actively listen to the perspectives of IP team members	6.00 (1.25)	7.00	0.041

17. Take into account the ideas of IP team members	6.00 (1.25)	7.00	0.026
18. Address team conflict in a respectful manner	5.50 (1.50)	7.00	0.119
19. Develop an effective care *** plan with IP team members	5.00 (1.00)	7.00	0.028
20. Negotiate responsibilities within overlapping scopes of practice	5.00 (1.25)	6.50	0.040

Key: # Likert Scale: 1 = strongly disagree; 2 = moderately disagree; 3 = slightly disagree; 4 = neutral; 5 = slightly agree; 6 = moderately agree; 7 = strongly agree.
* The patient's family or significant other, when appropriate, are part of the IP team.
** The word 'patient' has been employed to represent client, resident and service users.
*** The term "care" includes intervention, treatment, therapy, evaluation, etc.

B. Focus Group analysis

All (n=10) students participated in the focus group. Three key themes emerged from the thematic analysis of the focus group data: 1. Authenticity; 2. Mistakes are ok; 3. Learning.

Authenticity: Students reported that the simulated ward environment with the Mask-Ed™ character provided them with a learning environment that seemed real, which led to a feeling of authenticity. For example, in relation to the Mask-Ed™ character, two students commented:

"…it helps to get into the role of being a nurse and caring for an elderly patient because they've got the same attributes that a real patient has and they look like an elderly patient" (Nursing student).

"I guess it was realistic as well what would happen on a ward and, and, um, so I think that was a good experience for us" (Occupational Therapy Student).

Students stated that the simulated ward environment provided a more effective means by which they could understand and apply theoretical concepts, in comparison to other forms of teaching, as indicated by the following:

"I thought it was quite realistic how, with our client, we had, you know, multiple interruptions, she needed to go to the toilet, the cannula came out, nurses coming around to check stuff…. I guess it was realistic as well what would happen on a ward and, and, so I think that was a good experience for us" (Occupational Therapy student).

"It's a totally different ballgame when you're dealing with a live patient as opposed to a piece of paper" (Dietetic student).

"Well I said to [the supervisor] at the start, "Can I have the notes?" And he's like, "Oh, they're with the nursing staff." And I'm like, "Yeah, okay, this is real-life. It's not like a classroom, you know" (Occupational Therapy student).

Mistakes are ok: The simulation provided an environment for the students to make mistakes and learn from those mistakes, thus removing some of the angst and stress experienced when entering a clinical or patient centred environment for the first time, as indicated below:

"I think as someone that hasn't been on placement I'm very glad to have this experience prior to placement, because I made so many mistakes, but it was okay because I then got feedback from the people that I'd been nursing. It was really helpful" (Nursing student).

"I think just being able to have [the] opportunity to practise is, is important…the more you practise the more confident you feel" (Nursing student).

"I didn't pick up on, like, the rugs, so I don't think I was even looking at the floor unless [teacher] kind of pointed it out to us" (Occupational Therapy student).

Learning: Participants described situations where they gained knowledge in numerous areas regarding their own practice, other professional practice and the practicalities of working on a medical ward.

The students who participated in this study had minimal experience working with other health professionals. Students learned to understand the roles and responsibilities of other disciplines in caring for patients.

"I think with having the simulation was good to understand how you fit in with other health professionals" (Nursing student).

"I think we have a tendency as health professionals to think that our field is the most important one in the world and we fail to recognise that everyone's important. So I think it was a very eye-opening experience for me, because I knew that everyone has their special skill-set" (Dietetic student).

"I think that now I have a better idea of what the other healthcare professionals are going to be doing too and sort of feeling that, "Well, okay, this is my bit, this is my nurse bit. They're doing their bits." And just feeling more confident with it all, rather than, "Who are these random people around?" (Nursing student).

"I think for me I need to know what every other allied health professional is competent in and what they specialise in and when to refer and who does what" (Nursing student).

"I think the simulation was good to understand how you fit in with other health professionals" (Occupational Therapy student).

Students not only reported increased knowledge of other discipline's roles in health care but also of their own role and how roles can be blurred sometimes, as indicated below:

"We didn't do any effective [treatment] until someone had phoned to check on the dog. So just knowing that, okay, me as a dietitian I'm actually allowed to make that phone call and that would have been helpful to the nursing staff who were already doing other things" (Dietetic student).

Students reported that the simulation gave them the opportunity to learn professional behaviours such as prioritisation, negotiation, communication, teamwork and organisation and that this gave them confidence that they would be able to perform in a real situation.

"I need to be able to say, "Well, yes, the obs are due four hourly. OT [Occupational Therapy] are going to come in 30 minutes. I'll do them 30 minutes earlier. Is that going to upset the doctors? Is that, you know, that sort of planning and negotiating and, and that sort of thing. And I think the simulation was very good to be able to give you that experience of communication" (Nursing student).

"I'll probably say self-confidence, because I have issues talking with people and everything, so one thing is having confidence in yourself and knowing what you do before you talk to other[s] [was], very good" (Nursing student).

"I sort of noticed how organised you have to be" (Nursing student).

Students also reported that the simulation also gave them a chance to reflect on the patient experience.

"I think to me it's like learning to think a little bit more in the patient's, or client's perspective" (Nursing student).

"I feel like having the confidence to advocate for my patient, because now I've got a better perspective" (Nursing student).

The simulation also gave the students the chance to learn the importance of a case conference and a family meeting as these opportunities are not normally included in class-room teaching. Many students commented that this experience was worthwhile and a good learning experience, as indicated below:

"In terms of the family conference, that was a really eye-opening experience as well because you've got two different types of families, I guess. You've got the families that are just, "Well, I'm here because I have to be here and I'm power of attorney and, like, whatever, she's going to die eventually." And you've got the other that's like, "I'm really loving and I want the best for my Mum", and whatever, so you've got two different types of people to deal with" (Nursing student).

"I really enjoyed the, the conferences and everything because I thought that was really good to see everybody, talking about their roles [and] how every element, like, complements each other and goes toward care "(Nursing student).

4. Discussion

This pilot study addressed three research questions; Is Mask-Ed™ an effective teaching method for inter-professional learning? What are the experiences of students as they use Mask-Ed™ in inter-disciplinary learning? and Can Mask-Ed™ facilitate health students understanding of other professions roles in the care of an older adult? The study findings showed that nearly all of the items on the ICCAS survey for interprofessional learning had significant improvement from pre-Mask-Ed use to post Mask Ed-use, and suggests that Mask-Ed™ is an effective technique for inter-professional learning. In addition, the qualitative findings of this pilot suggested that there were benefits to this technique that included understanding their role in the care of an older adult, learning with other disciplines and being prepared for the reality of clinical placement. Simulation, as a teaching technique in health care education, has been shown to be effective in providing students with IPL experiences (Hobgood, Sherwood, Frush, Hollar, Maynard, & Foster, 2010; Mitchell, Groves, Mitchell, & Batkin, 2010; Sansan-Fisher, Baitch, & Teterson, 2005) and the study found that this was true of the Mask-Ed™ technique. This pilot provided students with a unique experience of simulation through the use of Mask-Ed™ characters which enhanced the authenticity and allowed inter-professional interaction during the experience.

In terms of the experiences of the students, while the findings of this study are similar to the literature that suggests simulation provides a learning environment that can lead to improved student knowledge, skills and behaviours resulting in improved outcomes for patients (Cook, Hatala, Brydges, Zendejas, Szostek, Wang, & Hamstra, 2011), the Mask-Ed™ technique enhanced the real-life practical dimension. In doing so, the Mask-Ed™ simulation technique used in this pilot was able to enhance the practical skills of team work and interdisciplinary team work in health-care students and their application in a risk-free environment. The authentic interactive nature of the Mask-Ed™ proved to positively affect the learning environment in this cohort. Utilising Mask-Ed™ as a simulation technique has a further advantage, as Mask-Ed™ characters are health professionals and are able to 'coach' the students throughout the simulation scenario. The ability and knowledge that students can make mistakes with minimal consequences, provides not only a valuable learning experience but also allows the student to be more self-reflective in terms of the their thought processes, behaviours and eventual actions (Mitchell, Groves, Mitchell, & Batkin, 2010; World Health Organization, 2010). Additionally, the qualitative analysis from the data indicated that students had the opportunity to learn with and about the role of other disciplines and develop their professional skills in an authenticity and safe environment.

IPL is an important component of health care education, however many barriers to incorporating IPL activities into discipline curriculum have been shown to be difficult, particularly in the 'real-life' settings (Lawlis, Anson, & Greenfield, 2014). Our previous study, which used the Mask-Ed™ technique through digital story telling, was effective in eliciting student understanding of inter-professional roles (Frost, Isbel, Kellett, & Lawlis, 2017). The authors have built upon the findings in the current study to find that an authentic simulated Mask-Ed™ pre-clinical experience combined with the case conference and family meeting, was more effective as students were able to learn more about not only their role, actions and behaviours in the care of a patient but that of other health professions. Throughout the pilot the students were learning together as the simulation scenario's involved multiple disciplines interacting with each other at the same time. The combined qualitative and quantitative analysis not only supports the pilot as an effective means from which students can experience IPL but also a format in which the IPL competencies: communication, collaboration, roles and responsibilities, collaborative patient/family-centred approach, conflict management/resolution and team functioning (World Health Organization, 2010); can be met.

There are three main limitations that need to be considered. Firstly, the sample size in this study was small (n=10). However, as this is a pilot simulation, the small sample size allowed the authors to pilot the methods and scenarios to conduct the study. In addition, the size of the pilot was limited by the ward's capacity. Secondly, only three disciplines participated, therefore participants were not exposed to the roles and responsibilities of all health professions involved

in the health care of older adults in an acute ward setting. While this may have influenced the students' ability to answer post-simulation learnings in regards to these disciplines, the inclusion of more disciplines in the ward simulation may have overcomplicated the scenarios and the students' application and understanding of their and their peer's roles. Thirdly, IPL across all professions in the real world was not experienced in this simulation; therefore we recommend expanding the simulation in the future to include all professions included in the survey.

As a pilot, the findings suggest that Mask-Ed™ is a technique worthy of further research in relation to IPL. Larger cohorts of students and the inclusion of other disciplines and potentially other Mask-Ed™ characters would allow further conclusions about the effectiveness of this technique to be drawn. Additionally, comparative studies with other simulation modalities would strengthen the transferability of the findings of this pilot study.

5. Conclusion

This pilot study found that Mask-Ed™ simulation is an effective method that can be used to teach IPL to health students. Statistically significant improvements were found in collaboration, roles and responsibilities, patient centred approach, conflict management and team management, suggesting Mask-Ed™ has a previously untapped potential as a modality to teach IPL. Furthermore, findings suggest that Mask-Ed™ is an authentic learning tool which enables students to learn the roles and responsibilities of other health professionals, and develop professional behaviours, in a safe environment. Larger comparative studies are required to compare Mask-Ed™ with other simulation techniques in the area of IPL.

Contributorship:

Each author has contributed significantly to the paper and has met the criteria specified by the International Committee of Medical Journal Editors.

References

Archibald, D., Trumpower, D., & MacDonald, C. (2014). Validation of the interprofessional collaborative competence attainment survey (ICCAS). *Journal of Interprofessional Care,* 28(6), 553-558.

Australian Physiotherapy Association. (2014). Behind the Mask. from Available at: https://www.cqu.edu.au/__data/assets/pdf_file/0011/89813/S12DWR-A3-C13121208440.pdf

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology,* 3(2), 77-101.

Centre for the Advancement of Inter-Professional Education. (2002). Inter-professional Education: Definition. from [cited 27 June 2016]. Available from: http://www.caipe.org.uk

Consan Consulting. (2012). Evaluation of the GP Super Clinics Program 2007-2008 7.5.3 Role of the University. Canberra: Australian Government Department of Health.

Cook, D., Hatala, R., Brydges, R., Zendejas, B., Szostek, J., Wang, A., & Hamstra, S. (2011). Technology-Enhanced Simulation for Health Professions Education: A Systematic Review and Meta-analysis. *JAMA,* 306(9), 978-988. doi: doi:10.1001/jama.2011.1234

Dornan, T., Littlewood, S., Margolis, S., Scherpbier, A., Spencer, J., & Ypinazar, V. (2009). How can experience in clinicatl and community settings contribute to early medical education? A BEME systematic review. *Medical Teacher,* 28(1), 3-18.

Ewertsson, M., Allvin, R., Holmstrom, I., & Blomberg, K. (2015). Walking the bridge: Nursing students' leaning in clinical skill laboratories. *Nurse Education in Practice,* 15(4), 277-283.

Frith, H., & Gleeson, K. (2004). Clothing and embodiment: men managing body image and appearance. *Psychology of Men and Masculinity,* 51(1), 40-48.

Frost, J., Isbel, S., Kellett, J., & Lawlis, T. (2017). Using Digital story telling to assess health students' knowledge of interprofessional roles in the care of the older adult. *BMJ Simulation and Enhanced Technology Learning,* 3(1), online.

Frost, J., & Reid-Searl, K. (2015). Exploring the potential of Mask-EdTM (KRS simulation) to teach both the art and science of nursing: A discussion paper. *Collegian [internet],* October 16, 1-7.

Hobgood, C., Sherwood, G., Frush, K., Hollar, D., Maynard, L., & Foster, B. (2010). Teamwork training with nursing and medical students: does the method matter? Results of an interinstitutional, interdisciplinary collaboration. *Quality and Safety in Health Care,* 19(6), e25-30.

IBM Corp ©. (2015). IBM SPSS Statistics [Computer program on CD-ROM].32 bit ed. Version 23. New York, US: IMB Corp.

Kable, A., Arthur, C., Levett-Jones, T., & Reid-Searl, K. (2013). Student evaluation of simulation in undergraduate nursing programs in Australia using quality indicators. *Nursing and Health Sciences,* 15(2), 235-243.

Lapkin, S., Levett-Jones, T., & Gilligan, C. (2012). A cross-sectional survey examining the extent to which inter-professional education is used to teach nursing, pharmacy and medical students in Australian and New Zealand Universities. *Journal of Interprofessional Care,* 26, 390-396.

Lawlis, T., Anson, J., & Greenfield, D. (2014). Barriers and enablers that influence sustainable interprofessional education: a literature review. *Journal of Interprofessional Care*(28), 4.

Mitchell, M., Groves, M., Mitchell, C., & Batkin, J. (2010). Innovation in learning – an inter-professional approach in improving communication. *Nurse Education in Practice,* 10, 379-384.

Reid-Searl, K. (2011). Mask-Ed TM KRS Simulation, user guide. Rockhampton: Central Queensland University.

Reid-Searl, K., Bowman, A., McAllister, M., Cowling, C., & Spuur, K. (2014). The masked educator-innovative simulation in an Australian undergraduate Medical Sonography and Medical Imaging program. *Journal of Medical Imaging and Radiation Sciences,* 61(4), 233-240.

Reid-Searl, K., Levett-Jones, T., Cooper, S., & Happell, B. (2014). The implementation of MaskEd: Reflections of academic participation. *Nurse Education in Practice,* 14, 485-490.

Sansan-Fisher, R., Baitch, L., & Teterson, E. (2005). From bland to grand: an approach to classification of interprofessional education for undergraduate health sciences. *Focus on Health Professional Education: A Multidisciplinary Journal,* 7(1), 34-48.

Wenrich, M., Jackson, M., Wolfhagen, I., Ramsey, P., & Scherpbier, A. (2013). What are the benefits of early patient contact? – A comparison for three preclinical patient contact settings. *BMC Medical Education,* 4(13), 1-7.

World Health Organization. (2010). Health Professions Networks Nursing & Midwifery Human Resources for Health. Framework for Action on Interprofessional Education & Collaborative Practice. Report No: WHO/HRH/HPN/10.3. Geneva: WHO.

Supplementary Information

Inter-professional learning for healthcare students through a simulated ward experience using Mask-Ed™(KRS simulation)™

Student Focus Group Questions

1. What is your overall view of the simulation program?

2. What did you learn about yourself while undertaking the simulation program?

3. What did you learn about the other health professionals while undertaking the simulation program?

4. What skills did you develop (new and further development of current skill base?

5. What do you believe worked well in the simulation program?

6. Before expanding this program to other students, what do you think needs improving in the simulation program?

7. How has this program prepared you for your first clinical placement?