Improving Affective Fidelity of Simulations: A Strategy to Enhance Emotional Learning for Undergraduate Nursing Students

Jeanette Ignacio, MD
Alice Lee Centre for Nursing Studies
Yong Loo Lin School of Medicine
Background

• High-acuity clinical events evoke strong emotional responses that can affect performance
  – Management of the patient
  – Patient outcomes

• Stressors in the clinical setting pose remarkable effects to healthcare professionals
  – ability to analyze clinical situations, to make decisions and to perform certain clinical procedures (LeBlanc, 2009)
Background

- Nurses’ role is pivotal as first responders
  - Critical to manage emotions

- Strategy to provide emotional training in a high-acuity or stressful event may reduce stress (Liaw, et al., 2012; Harvey, et al., 2010)
Background

• **Simulation should also address affective issues to be effective** *(Kneebone, 2005)*
  – degree of realism of simulation training results in similar learner emotional responses *(Flanagan, Nestel and Joseph, 2004)*

• **Standardized patients (SPs)**
  – appropriate “tools” to bring realism to a clinical scenario *(Anderson, Holmes, LeFlore, Nelson and Jenkins, 2010)*
  – Communication and interaction
Objectives

• To determine the effects of using standardised patients (SPs) versus simulators in deteriorating patient simulations in terms of performance and stress

• To explore students' feedback on the value of SPs in simulation training to prepare them for their clinical attachment
Methods

• Participants were students enrolled in Clinical Decision-Making module
  – Simulation sessions of deteriorating patients and resuscitation scenarios
  – SP and Simulator Preparation

• Outcome measures
  – Salivary alpha-amylase
  – Rescuing A Patient In Deteriorating Situations (RAPIDS) tool
    *(Liaw, et al., 2012)*
Methods

Figure 1: CONSORT diagram of the study

57 Participants, Randomised

Intervention Group N=29

Control Group N=28

Simulation Pre-test (Demographics, Baseline & post-surgery, alpha-amylase, RAPIDs tool)

Simulation Intervention Programme with three simulation stations

Intervention Group (SP) N=29

Control Group (Simulator) N=28

Simulation Post-test (Baseline & post alpha-amylase, RAPIDs tool)

9 Week Clinical Attachment

Focus Group Discussion (14 Participants)
Methods
# Results: Demographics

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Mean (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>21.75 (1.078)</td>
<td>20-25</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>8</td>
<td>14.0</td>
</tr>
<tr>
<td>Female</td>
<td>49</td>
<td>86.0</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td>51</td>
<td>89.5</td>
</tr>
<tr>
<td>Malay</td>
<td>4</td>
<td>7.0</td>
</tr>
<tr>
<td>Indian</td>
<td>1</td>
<td>1.8</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>1.8</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polytechnic Diploma</td>
<td>10</td>
<td>17.5</td>
</tr>
<tr>
<td>Junior College</td>
<td>47</td>
<td>82.5</td>
</tr>
</tbody>
</table>

©JIgnacio_CDTL_Nov2014
Results

- Inter-rater reliability across two assessors
  - Pre-test ICC
    - 0.906 (95% CI, 0.840-0.944)
  - Post-test ICC
    - 0.930 (95% CI, 0.882-0.959)
# Results: Performance

Table 2: Comparison of performance by groups

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Group</th>
<th>N</th>
<th>Pre-test M (SD)</th>
<th>Post-test M (SD)</th>
<th>Difference M (SD)</th>
<th>Within Groups t values</th>
<th>Between Groups F values</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAPIDS Tool Scores</td>
<td>Intervention</td>
<td>29</td>
<td>55.07 (11.56)</td>
<td>69.33 (7.87)</td>
<td>13.13 (10.28)</td>
<td>-7.017***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>28</td>
<td>53.91 (14.08)</td>
<td>67.99 (11.23)</td>
<td>14.14 (16.03)</td>
<td>-4.647***</td>
<td>0.108</td>
</tr>
</tbody>
</table>

*p value significant at <0.05

***p value significant at <0.001

©Ignacio_CDTL_Nov2014
## Results: Stress

**Table 3 Comparison of stress by groups**

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Group</th>
<th>N</th>
<th>Pre-test % change</th>
<th>Post-test % change</th>
<th>Difference</th>
<th>Within Groups</th>
<th>Between Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salivary alpha-amylase levels</td>
<td>Intervention</td>
<td>29</td>
<td>86.66 (18.94)</td>
<td>75.64 (29.58)</td>
<td>-11.02 (30.12)</td>
<td>0.366</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>28</td>
<td>88.34 (21.67)</td>
<td>43.49 (15.72)</td>
<td>-44.85 (19.91)</td>
<td>2.252*</td>
<td>1.021</td>
</tr>
</tbody>
</table>

% change values were calculated based on the following formulas:

\[
\text{Pre-test 2}^{\text{nd}} \text{ amylase collection} - \text{Pre-test baseline} / \text{Pre-test baseline} \\
\text{Post-test 2}^{\text{nd}} \text{ amylase collection} - \text{Post-test baseline} / \text{Post-test baseline}
\]

*p value significant at <0.05
Results: Focus Groups

• Stressful experience that developed emotional preparedness

• Developed student awareness on patient interactions

• Provided student practice in realistic environments
Stressful experience that developed emotional preparedness

- “SP gave us more stress, so in terms of stress, we know what to do”
- “it would be better in managing stress because the SPs can actually react to... they are real humans”
- “you can handle your anxiety level better compared to simulator ones.”
- “I was in the SP group and then for the first few times when we practiced, we always were very nervous, don’t know what to do, don’t know what to get. Because CDM (Clinical Decision-Making), we actually practiced, a lot, a lot of times for deteriorating patients. So I kind of know what to do in the clinical setting.”
- “For me, the SP session was more stressed because patient’s acting was very fierce, and he act very well also... actually I have met a few patients like very fierce...”
- “…I would feel more stressed because it’s really a human... But of course the SP was more helpful and realistic so when I’m more prepared, then I could relate to the patient, the real patient better.”
- “In the sense when SP comes in during school, it was a training opportunity with the SP. So I was able to face them with more confidence even though I was struggling inside.”
- “So, I feel that SP is better because it’s more real. And the thing is that it better helped me apply into practice when I am in my clinical attachment.”
- “There were two deteriorating incidents, the first one I panicked... then after that all the module stuff came back to my mind. The next incident that happened, I was more calm, I could do things better.”
- “So whatever you had that experience with the (standardised) patient, at that very moment you remember like emotions... it helped me to prepare myself for when I go to hospital...”
Developed student awareness on patient interactions

- “It allows spontaneous communication...”
- “… it would affect the way I respond or the way I interact, or the way I will nurse my patient...”
- “I felt that really helped in my communication skills in the hospital itself because the mannequin cannot portray real human feelings, react as like a human can, but a standardised patient could.”
- “Maybe SP gave us a wake-up call. We need to always keep in mind that we are not treating patients that are unresponsive to us. In that way it helps but at the same time every human is different.”
- “It helps with the communication part I guess...”
- “… to anticipate what kind of reactions they will have. It allows you to know where they are coming from. You will also empathise with them...”
- “The SP of course it helps more on communication part and anticipating what is unexpected.”
- “… we have to deal with their emotion (SPs).”
- “… I think standardised patient will help us, prepare for our non-verbal skill. I think we usually forget about that.”
- “…SP because living humans will give you reactions you cannot anticipate, so you have to learn to manage not only the clinical part but also how you interact with the human being as opposed to just a mannequin.”
- “So I think SP really trained me sort of multi-task because you have to, not only to handle the condition in the simulation but also handle the person you are taking care of. Not only the condition but also the person’s emotion...”
Provided student practice in realistic environments

• “...when they are in pain, they will act like a patient in pain which can be very difficult at times to handle... you will be more sensitive and you will be more aware of where they are coming from...”
• “...when you have SPs you can see that they are flushed, can see that they are real.”
• “...but for SP, you can feel the softness of the body like the hand can do things, the physical exam as compared to the SimMan.”
• “For me I’m from the mannequin group. I definitely think that the SP is more realistic in general.”
• “SP is the closest you get to the real thing.”
• “… we don’t know what to expect of the SP. Once we do this, he will react for us in this way... there will definitely be a response... So it is more realistic in that way.”
• “Then with the SP... you can see her flush rate, the lips turning blue or dry. You can actually do a physical assessment on the patient from head to toe...”
• “For me, actually in my ward, I experienced quite a bit of the deteriorating cases... it’s actually exactly the same as what we were taught in school.”
Discussion/Conclusion

• By enhancing the psychological fidelity of simulations, it was expected that the students will be able to practice their skills and show responses similar to real life clinical deterioration
  – Improvement in performance of both groups during post test showed that repeated exposures improved performance
  – Challenge to simultaneously perform skills & interact with "real" patient
• Amylase percent change values suggesting a general reduction of stress for both groups
  – Significant decrease in the simulator group, participants felt more stressed in the SP group – more realistic
• Future direction
References


©JIgnacio_CDTL_Nov2014
Thank you for your attention!