Mar 10th, 2:00 PM - 3:00 PM

Clinical Simulation, the Effect on Objective Test Scores

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THE EFFECT OF SIMULATION ON OBJECTIVE TEST SCORES

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Ida V. Moffett School of Nursing
Samford University
Background

- Private, Baptist University in Birmingham, about 450 students
- Traditional Undergraduate BSN
- Accelerated second degree BSN program
- Graduate programs, including FNP, Nurse Educator, Nurse Anesthesia, RN to MSN, & others
- DNP
They arrived!

- Obtained our first simulators in summer 2009
- Converted a classroom to a simulation room
- Faculty had several in-service events to prepare
- First simulation experience for students and faculty was in fall 2009
ROUND 2

- By spring 2010 we had a simulation center
- Observation room
- Debriefing room
- Pediatric room
- OB room
- Adult health room
- Anesthesia room
- Jan term of even more inservice
The students evaluations of their Sim experience has been consistently positive.

Results are consistent with most studies:
- Feel more confident
- Like risk free environment
- Like the challenge of working with peers as “real” nurses
Purpose

This project examined the effect of simulation utilized in the school of nursing on objective test scores.
HYPOTHESIS

There is no statistically significant difference on objective test scores between students who utilize simulated clinical experience to reinforce content as compared to students taught the same content without exposure to simulation. (alpha = .05)
ASSUMPTION

The study assumes that the multiple choice exam format is an accurate and appropriate way to evaluate clinical reasoning.
PROCEDURE

- First semester junior nursing students enrolled in clinical courses (Childbearing Family & Adult Health) in spring 2009 were not exposed to clinical simulation.
- The students enrolled in the same courses in fall 2009 and spring 2010 had a simulated experience to reinforce specific course content.
The childbearing simulation experience involved a complicated pregnancy.

The Adult health simulation patient was experiencing diabetic ketoacidosis.

This was the first simulation experience for the fall 2009 students and the second semester of simulation for the spring 2010 students.
## ADULT HEALTH SCORES

### No simulation – First simulation group

<table>
<thead>
<tr>
<th></th>
<th>No simulation MEAN (SD)</th>
<th>First simulation MEAN (SD)</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT EXAMS</td>
<td>71.67 (18.76) n = 39</td>
<td>71.50 (14.96) n = 20</td>
<td>57</td>
<td>-0.034</td>
<td>.973</td>
</tr>
<tr>
<td>FINAL EXAMS</td>
<td>87.69 (15.64) n = 39</td>
<td>85.00 (15.73) n = 20</td>
<td>57</td>
<td>-0.625</td>
<td>.535</td>
</tr>
</tbody>
</table>
RESULTS FIRST SIMULATION GROUP

There was no statistically significant difference in the unit exam scores or the final exam scores between Adult Health students with no simulation and the first group of simulation students.
<table>
<thead>
<tr>
<th>EXAMS</th>
<th>No simulation MEAN (SD)</th>
<th>second simulation MEAN (SD)</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT EXAMS</td>
<td>71.67 (18.76) n = 39</td>
<td>73.95 (16.20) n = 38</td>
<td>75</td>
<td>-0.57</td>
<td>.285</td>
</tr>
<tr>
<td>FINAL EXAMS</td>
<td>87.69 (15.64) n = 39</td>
<td>95.14 (8.70) n = 37</td>
<td>74</td>
<td>-2.54</td>
<td>.007</td>
</tr>
</tbody>
</table>
RESULTS – SECOND SIMULATION GROUP

- There was no statistically significant difference in the unit exam scores between the Adult Health students with no simulation and the second group of simulation students.

- There was a statistically significant difference in the final exam scores between the Adult Health students with no simulation and the second group of simulation students. The second group of simulation students scored higher on the final exam.
## CHILDBEARING FAMILY SCORES

### No simulation – first simulation group

<table>
<thead>
<tr>
<th>UNIT EXAMS</th>
<th>No simulation MEAN (SD)</th>
<th>First simulation MEAN (SD)</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>83.11 (19.69) n = 38</td>
<td>72.73 (17.52) n = 22</td>
<td>58</td>
<td>-2.046</td>
<td>.045</td>
</tr>
</tbody>
</table>

| FINAL EXAMS         | 88.72 (16.41) n = 39    | 89.09 (16.01) n = 22       | 59 | 0.086 | .932 |
RESULTS FIRST SIMULATION GROUP

- The Childbearing students with no simulation scored significantly higher on the unit exam than the first group of simulation students.
- There was no statistically significant difference in the final exam scores between the Childbearing students with no simulation and the first group of simulation students.
## CHILDBEARING FAMILY SCORES

### No simulation – second simulation group

<table>
<thead>
<tr>
<th></th>
<th>No simulation MEAN (SD)</th>
<th>Second simulation MEAN (SD)</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNIT EXAMS</strong></td>
<td>83.11 (19.69) n = 38</td>
<td>81.73 (15.93) n = 39</td>
<td>75</td>
<td>0.34</td>
<td>.368</td>
</tr>
<tr>
<td><strong>FINAL EXAMS</strong></td>
<td>88.72 (16.41) n = 39</td>
<td>93.33 (9.55) n = 39</td>
<td>76</td>
<td>-1.52</td>
<td>.067</td>
</tr>
</tbody>
</table>
RESULTS – SECOND SIMULATION GROUP

- There was no statistically significant difference in the unit exam scores between the Childbearing students with no simulation and the second group of simulation students.

- The difference in Childbearing final exam scores between the no simulation group and the second group of simulation students is approaching statistical significance.
DISCUSSION

- The first simulation group of students included students with only one experience with simulation.
- But this group also represented the first time simulation had been utilized by the teaching faculty involved in both courses.
DISCUSSION

- The second simulation group had more experience with simulation.
- This was also the second semester the faculty had utilized simulation.
- The faculty also had two presentations about simulation between the two semesters.
LIMITATIONS

- Methodological limitations to this study include:
  - Using a single setting
  - The limited scope of the material tested
  - The size and choice of the sample
  - The lack of control over clinical experience
RECOMMENDATIONS

• Additional research should be done to determine if faculty experience with simulation has an effect on the test scores of the students.
• Continue collecting data on future simulation experiences.
• Conduct qualitative study regarding student and faculty perceptions of simulation.
• Implement this research with a more diverse student population.
CONTACT INFORMATION

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