The Impact of Simulation on Pre-Graduated Medical Education of Gynecology and Obstetrics

Cristina Nogueira-Silva, Fábio Viveiros, Vera Trocado, Alexandra Miranda, Vanessa Silva, Ana Raquel Lemos, Jorge Correia-Pinto, Manuel João Costa
It is universally accepted that clinical skills constitutes an essential learning outcome.

Students sometimes complete their educational programs armed with theoretical knowledge but lack vital clinical skills for their work.
INTRODUCTION

Increased number of students entering in medical schools

Opportunities for medical students to learn and gain experience performing technical skills on direct physical examinations on patients has decreased.

To develop alternative strategies to overcome the deficit in training and decreased exposure to clinical cases.
Simulation-based training: a controlled and supervised environment and be able to repeat the same clinical gestures multiple times without risks for the patient

Simulation-based training in Gynecology and Obstetrics

Critical: due to the sensitive nature of examinations on this specialty, medical students may find these examinations particularly challenging and awkward, without prior training
**MAJOR AIM:** To evaluate the impact of the G&O simulation in student’s confidence, self‐comfort and performance in undergraduate medical education

**MINOR AIM:** To evaluate the influence of the G&O simulation in their interest in women’s health and interest in choosing this specialty as a future medical career.
METHODS

✓ A prospective, observational, descriptive and analytical study

To evaluate the influence of the G&O simulation in student’s confidence, self-comfort, performance, their interest in women’s health and interest in choosing this specialty as a future medical

To compare students exposed to the simulation with the unexposed

G&O

All the 4th year medical students from the School of Medicine – University of Minho (SM-UM) of two academic years

6th year medical students from SM-UM from an academic year not exposed and other from an academic year exposed
Gynecology
- Breast exam
- Speculum examination
- Pap smear test
- Bimanual pelvic exam

Obstetrics
- Leopold’s maneuvers
- Uterine size measuring
- Evaluation of Bishop’s score
- Collection of genital swab for GBS

Models and Simulators
METHODS

Study material about each clinical gesture

4 Students groups, 4 clinical gestures

Each group has a facilitator

Final Discussion
METHODS

To evaluate the influence of the G&O simulation in student’s confidence, self-comfort, performance:

- **4th year medical students (2015-2016 and 2016-2017)**

Pre- and post- surveys:
- ✓ Gender of the student
- ✓ Confidence
- ✓ Self-comfort
- ✓ Performance
- ✓ Interest for women’s health
- ✓ Interest in choosing G&O as future medical career

10-point scale (1 is lowest, 10 is highest)

After the clinical clerkship, students were asked to complete a final survey to evaluate the impact of the simulation curriculum on the clinical rotation.
METHODS

To compare the performance of students exposed vs. not exposed

- 6th year: final OSCE’s (objective structured clinical examination)

- A station for evaluation of 2 gynecology gestures (speculum examination and pap smear test) and others for 2 obstetric gestures (Bishop’s score and collection of a genital swab for GBS detection) were included (0-20)
# RESULTS

## Gynecology

Note: Data are scores on a 10-point scale (1 is lowest, 10 is highest)

SD: Standard Deviation; \(^*n=207\); \(^{b}n=207\); \(^{c}\) Paired \(t\)-test; \(^{*}\)Statistically significant

<table>
<thead>
<tr>
<th></th>
<th>Pre-Simulation(^a) (mean ± SD)</th>
<th>Post-Simulation(^b) (mean ± SD)</th>
<th>(p) Value(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Confidence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast Exam</td>
<td>5.77 ± 2.02</td>
<td>8.64 ± 1.07</td>
<td>(&lt;0.001^*)</td>
</tr>
<tr>
<td>Speculum Examination</td>
<td>5.40 ± 2.01</td>
<td>8.25 ± 1.09</td>
<td>(&lt;0.001^*)</td>
</tr>
<tr>
<td>Pap Smear Test</td>
<td>5.63 ± 2.02</td>
<td>8.60 ± 1.07</td>
<td>(&lt;0.001^*)</td>
</tr>
<tr>
<td>Bimanual Pelvic Exam</td>
<td>5.02 ± 1.99</td>
<td>8.12 ± 1.15</td>
<td>(&lt;0.001^*)</td>
</tr>
<tr>
<td><strong>Self-comfort</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast Exam</td>
<td>6.21 ± 2.38</td>
<td>8.62 ± 1.26</td>
<td>(&lt;0.001^*)</td>
</tr>
<tr>
<td>Speculum Examination</td>
<td>5.79 ± 2.28</td>
<td>8.51 ± 1.21</td>
<td>(&lt;0.001^*)</td>
</tr>
<tr>
<td>Pap Smear Test</td>
<td>5.88 ± 2.28</td>
<td>8.59 ± 1.18</td>
<td>(&lt;0.001^*)</td>
</tr>
<tr>
<td>Bimanual Pelvic Exam</td>
<td>5.61 ± 2.27</td>
<td>8.40 ± 1.27</td>
<td>(&lt;0.001^*)</td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast Exam</td>
<td>5.37 ± 2.04</td>
<td>8.42 ± 1.01</td>
<td>(&lt;0.001^*)</td>
</tr>
<tr>
<td>Speculum Examination</td>
<td>5.18 ± 1.95</td>
<td>8.16 ± 0.97</td>
<td>(&lt;0.001^*)</td>
</tr>
<tr>
<td>Pap Smear Test</td>
<td>5.32 ± 1.97</td>
<td>8.33 ± 0.98</td>
<td>(&lt;0.001^*)</td>
</tr>
<tr>
<td>Bimanual Pelvic Exam</td>
<td>4.80 ± 2.03</td>
<td>8.07 ± 1.04</td>
<td>(&lt;0.001^*)</td>
</tr>
</tbody>
</table>

207 Students
## RESULTS

### Gynecology

207 Students

<table>
<thead>
<tr>
<th>Interest in women’s health</th>
<th>Pre-Simulation(^a) (mean ± SD)</th>
<th>Post-Simulation(^b) (mean ± SD)</th>
<th>(p) Value(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.75 ± 1.92</td>
<td>8.08 ± 1.67</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

| Interest in G&O\(^d\) as a future medical career | 5.86 ± 2.60 | 5.96 ± 2.48 | 0.066          |

Note: Data are scores on a 10-point scale (1 is lowest, 10 is highest)
SD: Standard Deviation; \(^a\)n=207; \(^b\)n=207; \(^c\) Paired t-test; \(^d\) Gynecology and Obstetrics
*Statistically significant
### RESULTS

**Obstetrics**

243 Students

Note: Data are scores on a 10-point scale (1 is lowest, 10 is highest)  
SD: Standard Deviation; a n=243; b n=243; c Paired t-test; *Statistically significant

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>Confidence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leopold’s Maneuvers</td>
<td>3.23 ± 2.03</td>
<td>8.31 ± 1.28</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Uterine Size Measuring</td>
<td>4.16 ± 2.33</td>
<td>8.85 ± 1.17</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>GBS detection</td>
<td>4.53 ± 2.34</td>
<td>8.97 ± 0.99</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Bishop’s score</td>
<td>3.24 ± 1.98</td>
<td>7.55 ± 1.41</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td><strong>Self-comfort</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GBS detection</td>
<td>5.41 ± 2.72</td>
<td>8.45 ± 1.36</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Bishop’s score</td>
<td>4.82 ± 2.71</td>
<td>8.32 ± 1.63</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leopold’s Maneuvers</td>
<td>3.31 ± 2.06</td>
<td>8.57 ± 1.41</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Uterine Size Measuring</td>
<td>3.78 ± 2.30</td>
<td>8.17 ± 1.45</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>GBS detection</td>
<td>4.13 ± 2.27</td>
<td>8.30 ± 1.29</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Bishop’s score</td>
<td>3.33 ± 2.00</td>
<td>7.70 ± 1.48</td>
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### RESULTS

Obstetrics

243 Students

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<thead>
<tr>
<th>Interest in women’s health</th>
<th>Pre-Simulation(^a) (mean ± SD)</th>
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</tr>
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<tbody>
<tr>
<td></td>
<td>7.86 ± 1.91</td>
<td>9.07 ± 1.27</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Interest in G&amp;O(^d) as a future medical career</td>
<td>5.74 ± 2.66</td>
<td>5.77 ± 2.67</td>
<td>0.341</td>
</tr>
</tbody>
</table>

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*Statistically significant
RESULTS: Final Survey

Gynecology

- Did not improved: 1.4%
- Improved: 9.6%
- Improved very much: 41%
- Improved much: 48%

Obstetrics

- Did not improved: 0.8%
- Improved: 10%
- Improved very much: 37%
- Improved much: 52.2%
RESULTS

Effect of Simulation on performance after 2 years

n= 111 students
✓ 49 not exposed (Control)
✓ 62 exposed (Simulation)

*: p<0.001; t-test
✓ Self-reported data (may not correspond to reality)

✓ Did not assess student clinical performance of these gestures in real-life patients (ultimate goal of the simulation exercise)

✓ There was a lack of individual feedback for the students after the simulation
✓ Simulation in G&O seems to improve students’ confidence, self-comfort, performance and interest in women’s health.

Improved confidence and student’s self-comfort may result in greater participation in clinical clerkships, which can result in more experience in performing clinical skills in real patients

✓ Simulation seems also to provide higher qualified performance.
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