A PILOT STUDY TO INTEGRATE AN IMMERSIVE VIRTUAL PATIENT WITH A BREAST COMPLAINT AND BREAST EXAM SIMULATOR INTO A MEDICAL STUDENT SURGERY CLERKSHIP

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Background: Taking a history and performing a breast examination on a woman with a breast complaint are essential clinical skills. The purpose of this study was to determine if a curriculum to teach these skills using a virtual scenario and a simulated breast mannequin can prepare third-year medical students rotating on surgery for history-taking (HT) and performing a breast exam (BE) on a real patient (RP) with a breast complaint.

Methods: After receiving baseline instruction in HT and BE through a faculty-delivered lecture and small group session utilizing a breast simulator (Figure 1) to teach the exam, medical students at the Medical College of Georgia (N=21) were randomized to either an interaction with a virtual patient (VP) with a breast complaint (Group 1, N=11) or to no VP interaction (Group 2, N=10) before an interaction with an RP with a breast complaint in the surgical oncology clinic. After the RP interaction, subjects in Group 2 also had the opportunity to interact with the VP. In the virtual scenario, subjects interact with a life-sized VP projected on the wall of an exam room via a commercially available speech recognition engine (Figure 2). Participants completed baseline and completion surveys to assess confidence and anxiety regarding HT and BE and the educational value of the curriculum. Data=Mean ± SD. Data were analyzed using paired and Student's t-tests.

Results: Most students felt the components of the breast curriculum were valuable (lecture- 89.7%, small group- 81.0%, surgical oncology clinic experience- 100%). Overall, students had significantly greater confidence in their HT and BE skills and less anxiety when performing BE after completing the curriculum (Table 1). When compared by group, students exposed to the VP prior to their RP interaction in clinic had significantly greater confidence in their HT skills after completing the curriculum (Table 2).
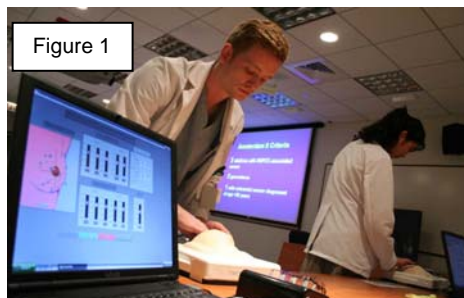
Figure 1

Table 1: Comparison of Baseline and Completion Measures (N=21)

Measure	Baseline	Completion	Δ-value
HT confidence[1]	2.86 ± 1.01	3.90 ± 0.70	1.05 ± 1.28*
HT anxiety[2]	2.52 ± 0.75	2.10 ± 0.77	-0.42 ± 0.98
BE confidence[1]	2.52 ± 0.87	3.67 ± 0.80	1.14 ± 0.91*
BE anxiety[2]	3.14 ± 1.06	2.38 ± 0.74	-0.76 ± 1.10*

[1]Five-point Likert-type scale (1=least confident 5=most confident)
[2]Five-point Likert-type scale (1=least anxious 5=most anxious)
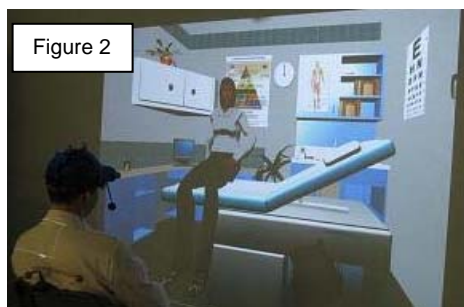*p<0.05, paired t-test

Figure 2

Table 2: Comparison of Completion Scores by Group

Measure	Group 1 (VP→RP)	Group 2 (RP→VP)
HT confidence[1]	4.27 ± 0.47	3.50 ± 0.71*
HT anxiety[2]	1.91 ± 0.70	2.30 ± 0.82
BE confidence[1]	3.64 ± 1.03	3.70 ± 0.48
BE anxiety[2]	2.45 ± 0.69	2.30 ± 0.82

[1]Five-point Likert-type scale (1=least confident 5=most confident)
[2]Five-point Likert-type scale (1=least anxious 5=most anxious)
*p<0.05, Student's t-test

Conclusions: In the context of a curriculum to teach breast history-taking and exam, VPs increase learner confidence in history-taking. There is tremendous potential to enhance current methods of teaching these important skills during the surgery clerkship through the use of virtual scenarios and mannequin-based simulators.