

Try- It! Mini-Grant Report

Amy Ravin, MD

Department of Obstetrics and Gynecology

St. Louis University School of Medicine

Project title: Using model simulation to enhance medical student education about labor and delivery

Course: third year medical student ob/gyn rotation, and some fourth year subinternships on obstetric rotations

Background: All third year medical students rotate through obstetrics and gynecology for 6 weeks in their third year of medical school. They usually spend one week on days and one week on nights in the labor suite. This is part of their clinical education and is part of gaining knowledge of normal and complicated labor and delivery.

The teaching of various topics in obstetrics, gynecology and women's health occurs at various times and in various formats during their rotation. Primarily, they learn by seeing and doing on the hospital wards and in the clinics. On Friday mornings the students on the ob/gyn rotation attend Grand Rounds and have two formal lectures. Additionally, there is self-directed reading in a variety of hand-outs and textbooks

For labor and delivery, the medical students attend and participate in routine vaginal deliveries. Unfortunately, the students are often in competition with ob/gyn, family medicine and emergency medicine residents to perform deliveries. They very often watch the birth of the baby and assist directly in the delivery of the placenta.

Simulations are being used more frequently in a variety of training programs and in medicine. There is a growing literature showing that the use of simulators in medical education can improve various technical skills. One benefit is that students and residents learn and gain skills with no risk to patients. There is also a growing literature about simulators for education specifically about labor and delivery. One paper showed that it improved student confidence, satisfaction and performance on end of rotation exams. Pelvic anatomy and labor and delivery are three dimensional and can be complicated to understand. The use of 3-D models should enhance understanding by new learners.

Materials and Methods: For my *Try-It!* summer mini-grant, we bought a plastic model of the bony pelvis and a model fetus to use with it. Additionally, we obtained a model torso/pelvis that can simulate labor and delivery.

I then had groups of 3-5 students join me in 1.5-2.5 hour sessions to use the models in teaching about pelvic anatomy, the cardinal movements of labor, and a simulation of labor and delivery. Each student went through the process of labor and delivery with the model bony pelvis and then with the full model torso.

To evaluate this new teaching technique, I developed a standardized test of the students' knowledge of the stages of labor, lacerations that occur, and cardinal movements of labor. The test was given before and after the simulation exercise to measure if the simulation is helpful in teaching specific information about normal labor. Additionally, the students were given a questionnaire to for self-assessment of their knowledge and readiness to participate in a delivery before and after the simulation. Finally, they completed a survey to evaluate how useful the medical students found the simulation exercise.

Results: July to December we had 84 third year students do their ob/gyn rotation. 43 students participated in the simulation. The vast majority of those were third year students, approximately 4 were fourth year subinterns. Twelve had already done their labor and delivery rotation, 28 were in the process of doing it and three had not yet done it.

The following tables show their responses to the questions. Their self-assessed knowledge of the stages of labor and cardinal movements of labor improved markedly pre to post-test as shown in tables 1 and 2.

Table 1.

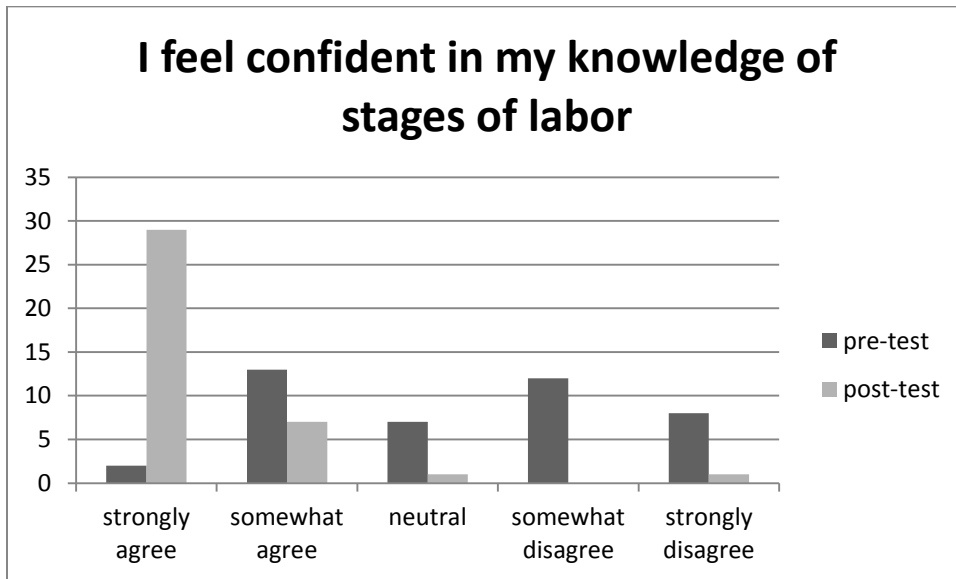
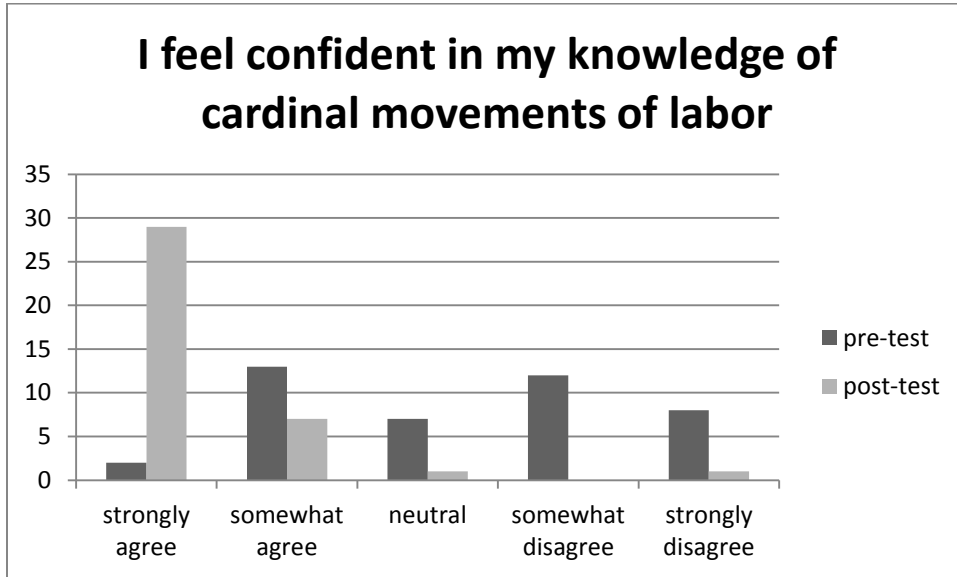
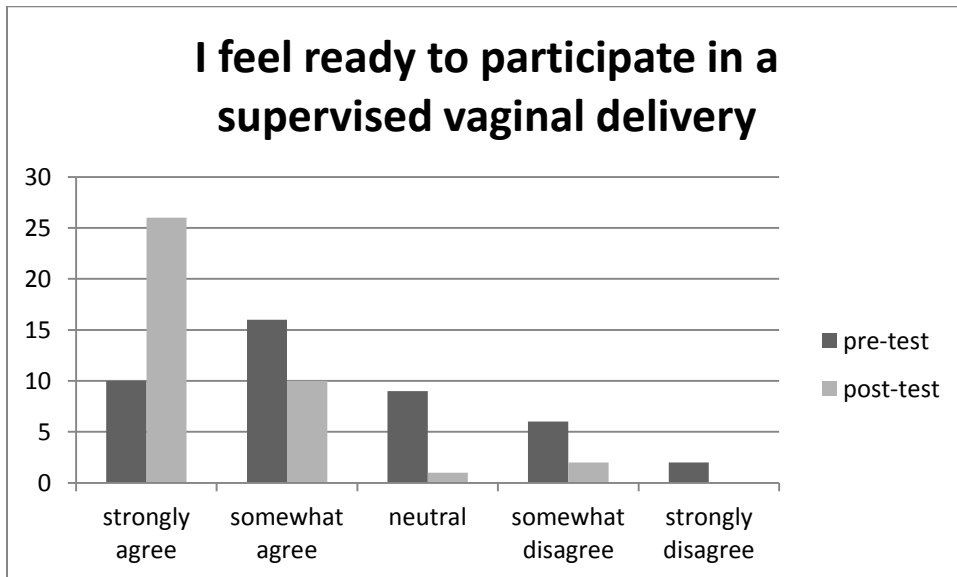


Table 2.



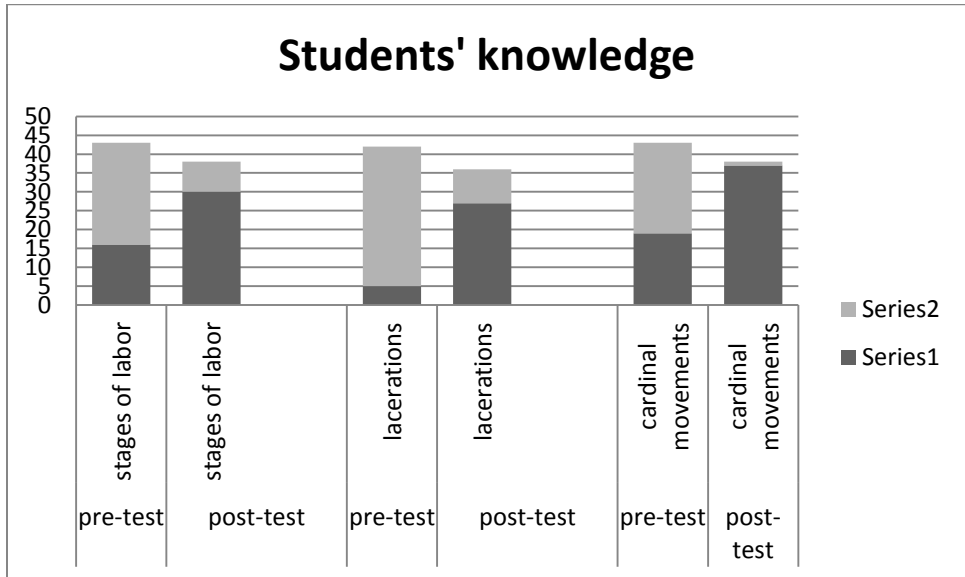
Additionally, the students' self-assessment of readiness to participate in a vaginal delivery with supervision markedly improved as shown in table 3.

Table 3.



The students were asked pre and post-test to write out the stages of labor, the cardinal movements of labor and to describe lacerations that occur during a vaginal delivery. They showed marked improvement in their knowledge in each of these areas after the simulation exercise as shown in table 4.

Table 4.



In the student assessment of the simulation exercise, the responses were overwhelmingly positive. 100% (43/43) stated that they strongly agreed with the statement that “Participating in the simulation was helpful.” All agreed (38/43 strongly, 5/43 somewhat) that “Participating in the simulation helped me understand the process of labor.” All agreed (27/43 strongly, 16/43 somewhat) that “Participating in the simulation helped me understand pelvic anatomy.” Most disagreed (19/44 strongly, 15/44 somewhat) that why could have gotten the same education from a lecture or discussion. All agreed with the statement “I would recommend continuing the use of the labor simulation during the third year rotation.”

In the appendix I have included the comments that they wrote at the end of the survey. These were also overwhelmingly positive with the most common suggestions to do the simulation routinely for all students and to do it as early as possible in the rotation.

Discussion:

The implementation of a formal small group labor simulation for third and fourth year students rotating through their ob/gyn clerkship was successful. The students gained knowledge, confidence in their skills and readiness to participate in patient care. The use of models allowed a hands-on, risk free setting for learning a complex 3-D process.

I have learned that this method of teaching was effective and the students enjoyed participating in it. However, it is time consuming for the educator! I hope in the future to expand the number of physicians and midwives who use the models to teach the students. This should help us increase the number that get to participate in the simulation. This will involve some co-ordination issues but should be achievable.

A small thing that I learned was that when the test/survey was printed on two sides of a paper, many students missed the entire reverse side of the paper. This is why some of the data is missing. They did not see the questions on the reverse side of the page. This did not occur when the questionnaires were single sided.

The models will have a limited life. The baby's arm broke almost immediately after getting caught on the "cervix." It is a small problem and doesn't really affect the quality of the simulation. However, the "joints" did frequently get caught. I thus have to assess the process and assist in ways that are not always physiologic to make the simulation proceed. The cervix seems to be the weakest part of the torso model. We have already torn two. Although we bought several replacement parts, we have only one more of those. I will have to explore ways to try to replace the elastic. Additionally, the model torso came with some models of lacerations. Although they are advertised as being able to be used for teaching suturing we found them much too difficult to use. They bent and broke the needles and after one use were permanently torn. Additionally, they do not give a very accurate demonstration of the anatomy of a laceration. They have very limited use.

The model does have some limitations, of course. It is not a perfect replica of normal human anatomy. The labia are very stiff and allow visualization of the cervix and fetus. I overcame this by draping our patient with a towel so the students could not see and had to palpate to do the cervical exam. Additionally, at a minimum during a cervical exam we assess dilation, effacement and station. The torso model does allow for a simulated pelvic exam, it only allows changes in dilation and station. It only has one level of effacement. I need to find another model to show the changes in effacement.

Despite its limitations, the model pelvic and torso were good additions to the standard ob/gyn clerkship educational repertoire.