Confidence in Performing Normal Vaginal Delivery in the Obstetrics Clerkship: A Randomized Trial of Two Simulators

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Abstract

Objective: To compare clerkship medical students' confidence in performing a simulated normal vaginal delivery (NVD) after participating in a simulation training session using two different models.

Methods: Medical students were randomized to participate in a simulated NVD session using either an obstetrics mannequin or a birthing pelvis model. Questionnaires were used to assess confidence and evaluate the simulation before and immediately after the session and on the last day of the obstetrics clerkship rotation.

Results: One hundred ten students were randomized. At the start of the clerkship, both groups had similar obstetrics exposure and confidence levels. Only 15 students (13.9%) agreed they were ready to attempt a NVD with minimal supervision or independently. This increased significantly to 43 students (39.4%) immediately after the session. At the end of the clerkship, 79 of 81 responding students (97.5%) were confident that they could attempt a NVD with minimal supervision or independently. There were no significant differences noted between simulator groups at any point. The sessions were rated as equally useful and realistic, and this remained unchanged at the end of the clerkship.

Conclusion: Simulated NVD training using either an obstetrics mannequin or a birthing pelvis model provides clerkship students with a positive experience and increases confidence immediately. It should be implemented early in the rotation, as it appears the clerkship experience also plays a large role in terms of students' confidence. Despite this, students maintain this type of learning is useful. Effective simulation training can easily be incorporated into clerkship training.

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Résumé

Objectif : Comparer la confiance des étudiants de médecine en stage clinique, pour ce qui est de l'exécution d'une simulation d'accouchement vaginal normal (AVN), à la suite de leur participation à une session de formation en simulation au moyen de deux modèles différents.

Méthodes : Des étudiants de médecine ont été affectés, au hasard, à une session de simulation d'AVN faisant appel à un mannequin obstétrical ou à une session de simulation faisant appel à un modèle de bassin simulant l'accouchement. Des questionnaires ont été utilisés pour évaluer la confiance et la simulation avant et immédiatement après la session, ainsi qu'au cours de la dernière journée de la rotation en obstétrique.

Résultats : Cent dix étudiants ont été affectés au hasard à l'un ou l'autre des groupes de simulation. Au début du stage clinique, les deux groupes présentaient des niveaux de confiance et d'exposition à la pratique obstétricale semblables. Seulement 15 étudiants (13,9 %) étaient d'avis qu'ils étaient prêts à tenter un AVN de façon indépendante ou sous une supervision minimale. Cette proportion a connu une hausse considérable en passant à 43 étudiants (39,4 %) immédiatement après la session de simulation. À la fin du stage clinique, 79 des 81 étudiants répondants (97,5 %) étaient confiants de pouvoir tenter un AVN de façon indépendante ou sous une supervision minimale. Aucune différence significative n'a été constatée entre les groupes de simulation à quelque moment que ce soit. Les sessions ont été évaluées comme étant tout aussi utiles et réalistes les unes que les autres; cette constatation est demeurée la même à la fin du stage clinique.

Conclusion : La formation faisant appel à la simulation d'un AVN au moyen d'un mannequin obstétrical ou d'un modèle de bassin simulant l'accouchement offre aux étudiants en stage clinique une expérience positive et accroît immédiatement leur confiance. Une telle formation devrait être mise en œuvre tôt au cours de la rotation, puisqu'il semble que l'expérience vécue au cours du stage clinique joue également un rôle important pour ce qui est de la confiance des étudiants. Peu importe la chronologie de la simulation, les étudiants soutiennent que ce type d'apprentissage leur est utile. Une formation efficace en simulation peut facilement être intégrée au stage clinique.

INTRODUCTION

Performing uncomplicated normal vaginal deliveries (NVD) is an essential skill to be learned during undergraduate medical training.[1,2] In 2001, more than 84% of students from responding United States medical schools delivered less than 10 babies during their obstetrics rotation.[2] Comparable data are not available for Canadian medical students, but given the large class sizes and high rates of Caesarean section, the chance to participate in actual vaginal deliveries is limited during clerkship. Patients can also refuse students' involvement. Few women expect them to deliver the baby and the placenta, and up to 30% may refuse medical student participation at the time of delivery because of concern that their inexperience could have a detrimental effect on their care.[1,3] Additionally, students may be intimidated by the obstetrics rotation. Jude et al. noted that a student's first obstetrics experience is often in the delivery room, "with all of the anxieties of the patient and student on full display," and demonstrated that untrained students lack confidence before performing their first vaginal delivery.[4]

To address situations like this, in which being unprepared and untrained can be detrimental, educators can use simulation.[5] Simulation-based training is widely used in medical training to help students develop good technical skills and approaches, as well as confidence, before they practise on patients.[6,7] The usefulness and effectiveness of simulation in obstetrics has been established, and it is frequently used to teach students to perform an uncomplicated NVD.[8–10] Three recent randomized studies demonstrated that medical students who practised uncomplicated NVD on a simulator were significantly more confident in their own ability to perform a vaginal delivery than those who received traditional lecture-based teaching and/or demonstrations only.[4,11,12] Additionally, simulator-trained students scored higher on oral, written, and performance examinations and were satisfied with the learning experience.[11–13] One small study also demonstrated that students who received the simulator training participated in significantly more deliveries during their clerkship, suggesting that the increased confidence allowed them to incorporate more quickly into the obstetrics team and that the response of patients to the increased confidence was more favourable.[11] All of these studies used the NOELLE obstetric mannequin (Gaumard Scientific, Miami FL).

Since practising NVD on an obstetrics simulator appears to be more beneficial than traditional teaching alone, we have incorporated simulation into the obstetrics curriculum. Our medical students receive teaching on either a life-size obstetric mannequin or a birthing model pelvis. Some instructors prefer the portability and simplicity of the model pelvis, whereby the facilitator pushes the baby through for the delivery. The obstetric mannequin is larger and more cumbersome to transport. It uses a hydraulic mechanism to deliver the baby, which might be considered more realistic. The purpose of our study was to compare medical students' self-rated confidence for attempting to perform NVD after a training session with either the obstetric mannequin or the model pelvis, in order to optimize clerkship training by using the better simulator and to provide additional evidence for effective simulator use in medical students' obstetrical training.

METHODS

Our third year medical students complete a six-week obstetrics and gynaecology clerkship rotation at one of four affiliated teaching hospitals. On the second day of the rotation, they attend a group orientation and introductory lecture on normal labour and delivery. During the 11 months allocated for the simulation sessions, all clerkship students were invited to participate in our study after this lecture.

The timeline of the study is presented in Figure 1. Participants answered an initial questionnaire identifying any previous clinical obstetrics experience and their baseline, self-rated levels of confidence pertaining to various aspects of NVD on a four-point scale (Figure 2). We used the same response scale and adapted the questionnaire used in two recent randomized NVD simulation studies of medical students.[4,12] We omitted questions about performing NVD alone or with resident supervision as this does not typically occur during clerkship at our institution. The questionnaire demonstrated content validity when assessed by two of our academic obstetrics faculty members before use. Construct validity and responsiveness had been demonstrated in the previous studies: students rated their confidence higher after simulated learning as well as with time and clerkship experience.[4,12]

After returning the baseline questionnaire, facilitators handed participants sequentially numbered opaque sealed envelopes containing their study group assignment. The randomization sequence was computer-generated in blocks of 10 to ensure equal distribution between groups, and was done before the start of the study by the principal investigator. The study arm consisted of a session on the NOELLE obstetric mannequin (Gaumard Scientific, Miami FL) and the control arm was a session with the Standard Prompt Birthing Simulator Pelvis (Limbs & Things Inc., Savannah GA). A simulated NVD requires the facilitator to push a lubricated model baby manually through the Prompt