

A Prospective Cohort Study Using e-Learning Modules as a Supplemental Teaching Resource for Obstetrics and Gynaecology Clerkship Students

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Abstract

Objective: Increasing enrolment in medical schools in Canada has necessitated the development of distributed clinical learning sites to provide appropriate clinical experience. The Faculty of Medicine at Dalhousie University has clinical clerkship sites distributed across Nova Scotia, New Brunswick, and Prince Edward Island, with diverse educational exposures. This study was designed to examine the influence of online learning modules, developed to standardize learning across education sites during the clinical clerkship, on the acquisition of knowledge by medical students during their obstetrics and gynaecology clerkship rotation.

Methods: The third year medical school class was divided into two natural cohorts for the purposes of this study. Group 1 had their obstetrics and gynaecology rotation from September 2012 to March 2013 (n = 54), and Group 2 had their rotation from April to September 2013 (n = 60). All students were given the opportunity to complete an online formative examination before their summative multiple choice examination; only Group 2 students had access to six obstetrics and gynaecology e-learning modules, upon which the formative examination was based.

Results: Forty-seven students in Group 1 (87%) and 45 students in Group 2 (75%) completed the formative examination, with an overall participation rate of 81%. There was no difference in median scores between Group 1 (score 9, IQR 8 to 10) and Group 2 (score 9, IQR 8 to 11, $P = 0.08$).

Conclusion: Having access to six e-learning modules did not improve the third year medical students' scores on a formative examination completed before their summative multiple choice examination.

Key Words: Obstetrics, gynaecology, undergraduate medical education, clinical clerkship

Competing Interests: None declared.

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Résumé

Objectif : L'accroissement du nombre des inscriptions aux facultés de médecine canadiennes a rendu nécessaire la mise sur pied de sites satellites d'apprentissage clinique pour offrir une expérience clinique adéquate. La faculté de médecine de l'Université Dalhousie compte des sites de stage clinique qui sont distribués d'un bout à l'autre de la Nouvelle-Écosse, du Nouveau-Brunswick et de l'Île-du-Prince-Édouard, lesquels offrent une diversité d'expositions pédagogiques. Cette étude avait pour but d'examiner l'influence des modules d'apprentissage en ligne (élaborés en vue de standardiser l'apprentissage d'un site de stage clinique à l'autre) sur l'acquisition des connaissances par les étudiants de médecine au cours de leur rotation en obstétrique-gynécologie.

Méthodes : Les étudiants de troisième année de médecine ont été répartis en deux cohortes naturelles aux fins de cette étude. La rotation en obstétrique-gynécologie des étudiants du groupe 1 s'est déroulée entre septembre 2012 et mars 2013 (n = 54) et celle des étudiants du groupe 2 s'est déroulée entre avril et septembre 2013 (n = 60). Tous les étudiants se sont vu offrir l'occasion de passer un examen formatif en ligne avant leur examen sommatif à choix multiples; seuls les étudiants du groupe 2 ont eu accès à six modules d'apprentissage en ligne en obstétrique-gynécologie (sur lesquels l'examen formatif a été fondé).

Résultats : Quarante-sept étudiants du groupe 1 (87 %) et 45 étudiants du groupe 2 (75 %) ont passé l'examen formatif (taux global de participation : 81 %). Aucune différence n'a été constatée en matière de scores médians entre le groupe 1 (score 9, écart interquartile de 8 à 10) et le groupe 2 (score 9, écart interquartile de 8 à 11, $P = 0,08$).

Conclusion : L'accès à six modules d'apprentissage en ligne n'a pas donné lieu à une amélioration des scores des étudiants de troisième année de médecine dans le cadre d'un examen formatif passé avant l'examen sommatif à choix multiples.

INTRODUCTION

Traditionally, medical training has been based on didactic lectures and hands-on clinical experience. Over the past decade, the average size of medical school classes in Canada has increased. This increase in learners has necessitated the development of numerous distributed clinical learning sites to ensure adequate clinical exposure for each student.¹ Community and regional hospitals are now relied upon to provide clinical exposure in addition to the more traditional university-affiliated tertiary care institutions.^{1,2} A major challenge for medical school undergraduate programs is providing a comparable learning experience for students regardless of their training site.³

E-learning is an educational tool that has evolved over time to help provide equivalent learning experiences for all students by bridging the gaps in education caused by distance, and by standardizing learning content across distributed teaching sites. This may be accomplished by using web-based tutorials, discussion boards, virtual patients, email, and Internet-mediated videoconferencing.⁴ The most cited advantage of e-learning is the increased accessibility to information regardless of location and time of day.^{2,5} Another benefit is the opportunity for personalized instruction, since learners are able to control aspects of the content, learning sequence, pace, and time of their experience.^{2,5} E-learning enables learners to be active participants in their own education, and motivates the learner to become more engaged.^{2,5} E-learning may help with the transition between the systematic acquisition of knowledge that dominates the first two years of medical school and the transfer of this knowledge into clinical practice that begins in clerkship.⁶

Numerous studies have addressed the influence of e-learning on overall educational achievement.^{3,4,7,8} Studies involving health care professionals have demonstrated a positive effect on satisfaction, knowledge, skills, and behaviours with e-learning compared with no intervention, with small and heterogeneous differences compared with traditional learning.^{4,7} Pediatric online case simulations have been shown to be beneficial in pediatric clerkships, and have been well received by program directors because these cases also helped programs meet accreditation standards by providing documented clinical experiences and consistency in education across training sites.³ A study evaluating an online resource to aid medical students in learning how to perform a pelvic examination showed a positive effect on knowledge and skill acquisition.⁸

Because of the limited available information on the subject, the primary objective of this study was to examine the influence of online learning modules on the acquisition of

knowledge by medical students during their obstetrics and gynaecology clerkship rotation. The secondary objective of this study was to develop online learning modules for this obstetrics and gynaecology clerkship program; these modules were designed to provide an additional learning resource for all students in the MD undergraduate program.

METHODS

The MD undergraduate program at Dalhousie University is divided into pre-clerkship (years 1 and 2) and clerkship (years 3 and 4). The pre-clerkship years offer a basic foundation in anatomy and physiology, including obstetrics and gynaecology. During clerkship, all students who are not part of a longitudinal integrated clerkship complete a six-week obstetrics and gynaecology rotation at a tertiary, community, or regional hospital in Nova Scotia or New Brunswick. Formal teaching includes a protected academic half-day each week with seminars given by faculty, as well as a separate half-day once every six weeks for students to give a 10-minute presentation to their peers on an assigned topic. Distributed sites participate in the academic half-days and student presentations by videoconferencing. Every 12 weeks during clerkship, two groups of students complete a summative multiple-choice question examination.

The development of six e-learning modules that were specific to obstetrics and gynaecology began in October 2012 and was completed in March 2013. The modules encompassed early pregnancy complications, menopause, cervical cancer screening, normal labour and group B streptococcus status, gestational diabetes mellitus, and postpartum hemorrhage. The modules were intended to supplement, and not replace, particular areas of the clerkship curriculum. The modules were developed using the SoftChalk software program (SoftChalk LLC, Richmond, VA), an eLearning program that allows educators to create and share interactive content. After the modules were developed, they were made accessible to all medical students in the Dalhousie program through the Dalhousie University Blackboard online learning system.

The third-year medical school class of 2012–2013 was chosen as the study population. A single class was chosen to minimize confounders such as curriculum changes. This group completed their six-week obstetrics and gynaecology clerkship rotation at various clinical teaching sites in New Brunswick and Nova Scotia between September 2012 and September 2013. The clinical teaching sites were community, regional, and tertiary care hospitals that provide health care services to communities with populations ranging from approximately 25 000 to 400 000

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