

Original Publication

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DREAM: Empowering Preclinical Medical Students With Labor Support

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Citation: Shakartzi H, Wenren L, Fernandes S, et al. DREAM: empowering preclinical medical students with labor support. *MedEdPORTAL Publications*. 2018;14:10665. https://doi.org/10.15766/mep_2374-8265.10665

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Abstract

Introduction: Delivery Resources, Experiences, and Advocacy for Moms (DREAM) is an interprofessional service-learning program that empowers preclinical medical students by training them to provide labor support. Boston Medical Center is a safety-net hospital featuring an in-house doula service with limited coverage capacity. Consequently, many patients do not receive continuous labor support, although evidence shows that continuous labor support improves outcomes and may help reduce birth-outcome health disparities. We present a pragmatic approach to integrating preclinical students as labor-support staff and outline the methods and content of the training process as well as the evaluations used to assess program effectiveness. **Methods:** Students were trained by doulas (Birth Sisters) and midwives to provide prenatal, labor, and postpartum support. Students completed an orientation and training workshop and then partnered with a Birth Sister for one prenatal visit, labor, and postpartum visit prior to working independently. Student leaders provided structure, mentoring, and support for preclinical students. Pre- and postsurveys assessed student confidence and obstetric knowledge acquisition. Budget, logistics, and program evaluation process are reviewed. **Results:** Students demonstrated increased knowledge, as well as confidence in communication, advocacy, and support. Although balancing DREAM with academics was stressful, students continued to meet academic standards and felt their participation was gratifying and worthwhile. Student reflections and patient statements on their experience show the program was mutually beneficial. **Discussion:** Preclinical students need gratifying clinical opportunities to develop confidence in communication and advocacy skills. Partnering them with underserved women to provide labor support is a pragmatic and clinically valuable intervention.

Keywords

Pediatrics, Obstetrics, Program Development, Labor Support, Doulas

Appendices

- A. DREAM Application.docx
- B. Orientation Outline and Content.docx
- C. Educational Handouts.docx
- D. Teens and Tots Presentation.pptx
- E. Assignment Log Templates .xlsx
- F. DREAM Pre- and Postevaluation Survey.docx
- G. DREAM Reflection Prompt .docx
- H. Quality Improvement Communications Checklist .docx
- I. DREAM Business Cards .docx

All appendices are peer reviewed as integral parts of the Original Publication.

Educational Objectives

By the end of this activity, learners will be able to:

1. Demonstrate enhanced knowledge in the field of obstetrics and gynecology.
2. Experience early clinical gratification by providing labor support to underserved women.
3. Develop increased confidence in providing labor support, in patient advocacy, and in patient and care-team communication skills.
4. Help expand labor-support coverage at a safety-net hospital.

Introduction

Delivery Resources, Experience, and Advocacy for Moms (DREAM) is an interprofessional service-learning program at the Boston University School of Medicine (BUSM), developed in order to bridge gaps in preclinical student knowledge and experience and optimal patient care in a low-resource setting. The program is designed to empower preclinical medical students by offering an opportunity to experience early clinical gratification, build confidence, and develop a unique set of skills while providing outreach.

Preclinical medical education is largely lecture based, with limited patient experience. Furthermore, OB/GYN residencies struggle with recruitment, with OB/GYN clerkships having consistently low student satisfaction scores in recent years.¹

Labor-outcome health disparities are widespread and include differences in rates of cesarean delivery, maternal and fetal death, hypertensive complications of pregnancy, postpartum hemorrhage, and postpartum depression.^{2,3} Reducing these disparities may be accomplished by providing optimal support throughout pregnancy, since evidence shows that continuous labor support improves outcomes and has clinically meaningful benefits.⁴ Continuous labor support has been shown to increase the likelihood of spontaneous vaginal delivery, resulting in shorter labors, improved patient satisfaction, reduced cesarean rates and instrumental deliveries, and decreased epidural use.⁴

DREAM is a labor-support service-learning program deployed at Boston Medical Center (BMC), a safety-net hospital with a highly underserved and poor patient population. Obstetric patients at BMC are especially vulnerable and high risk.⁵ The OB/GYN Department at BMC functions as an integrated care team comprising OB/GYN and family medicine physicians, in addition to nurse midwives. It additionally consists of 19 women from the neighboring urban community who participate in the Birth Sisters Program, an in-house, multicultural, labor-support program for patients with specific referral criteria. Birth Sister patients must have one of the following characteristics:

- New immigrant (<1 year).
- Teen (<18 years old).
- Refugee.
- Homeless.
- History of domestic violence or trauma.
- History of anxiety.
- History of depression.
- History of preterm labor.
- Plan trial of labor after cesarean.

The Birth Sisters Program is currently too understaffed to meet all our vulnerable patients' needs. Consequently, many women do not receive optimal labor support.

BMC also has a unique Teens and Tots Program, which is a prenatal/postpartum pediatric and adolescent primary care clinic for pregnant and parenting teen families. Adolescent families through the age of 20 can enroll in the program, and women who are less than 18 years old qualify for and receive a Birth Sister. However, given the limited capacity of the Birth Sisters Program, patients who are over 18 years old in the Teens and Tots Program may not receive a Birth Sister and thus may lack optimal labor support.

The DREAM Service-Learning Group was established to equip preclinical medical students with the skills necessary to provide effective prenatal, labor and delivery (L&D), and postpartum support in order to expand labor-support coverage and work toward the vision that all women with limited social support and services who give birth at BMC will have the opportunity to receive continuous labor support.

A program such as DREAM provides early clinical exposure through training and patient care and builds student confidence and OB/GYN knowledge, all the while expanding labor-support coverage. An obstetrics longitudinal course for first-year medical students is available on *MedEdPORTAL*⁶; however, there are currently no available resources for educators to train medical students to provide labor support independently or to follow as a guide to establish a labor-support team.

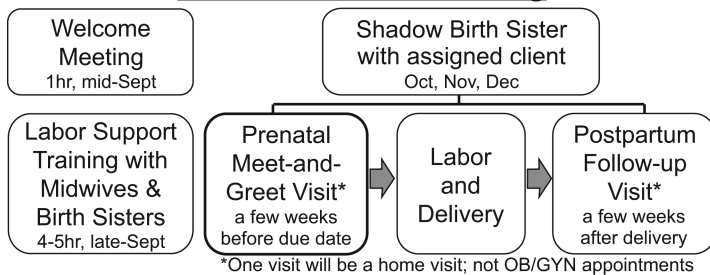
Methods

DREAM Structure Overview and Program Tracks

Preclinical medical students at BUSM were trained with prenatal, L&D, and postpartum support skills through collaboration with the OB/GYN Department, the Teens and Tots Program, and the Birth Sister Program at BMC. Training included a 5-hour orientation session led by midwifery faculty and select Birth Sisters at BMC, followed by a full shadowing experience with a Birth Sister and her patient. For the

shadowing experience, DREAM students were partnered with a Birth Sister and expected to attend one prenatal visit and one postpartum visit (one of which was a home visit) and an L&D for one patient prior to working independently. The shadowing experience was ideally accomplished by the end of the first semester of the academic year. After fulfilling the shadowing requirements, DREAM students were able to select one of two tracks to work independently, the General Labor Support Track or the Teens and Tots Program Track (Figure 1). The General Labor Support Track works with adult women, whereas the Teens and Tots Program Track works with adolescent women between the ages of 18-20 who are enrolled in the Teens and Tots Program. Students participating in either track were required to attend one prenatal and one postpartum visit, in addition to the L&D. Students who chose to participate in the Teens and Tots Program Track were required to attend additional educational lectures, an additional “meet the pediatrician” prenatal appointment, and two well-child pediatric visits after delivery. Students who participated in the Teens and Tots Program Track had the opportunity to follow their patient in the Teens and Tots clinic longitudinally for additional visits if desired.

Orientation and Training



Providing Labor Support: Your Own Clients

Choose one track:

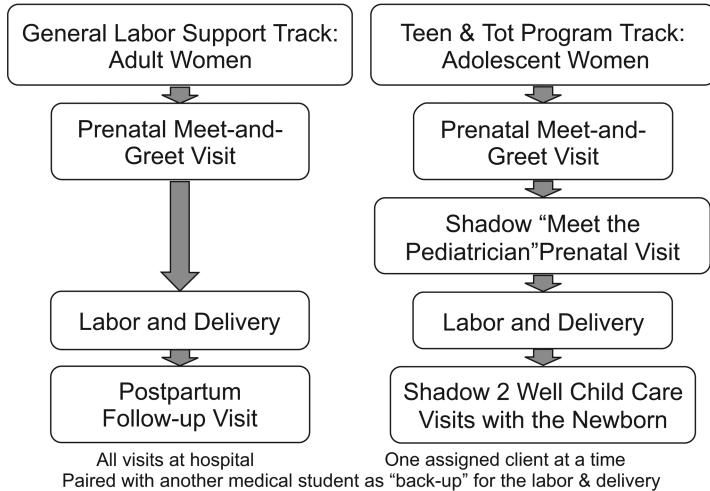


Figure 1. DREAM Program structure and overview with general academic-year time line.

Preclinical Student Recruitment and Selection

Preclinical medical students (MS1 and MS2) voluntarily applied to participate in DREAM at the end of August by completing a student-designed short-answer application that highlighted clear program expectations and requirements (Appendix A). The program was introduced to students through a service-learning presentation to new MS1 students during orientation, the annual student activities fair, class-wide emails, and an additional information session designed to ensure that students appropriately understood the program and its requirements.

Eight MS1 and MS2 students were selected to participate as new members in DREAM. Enrollment was capped at eight students due to limited capacity of the Birth Sisters Program for student shadowing. DREAM Student Leaders selected new students based on the short-answer responses concerning their time-management skills, reason for participation in the program, languages spoken, and other extracurricular involvement during medical school. Given BMC's highly diverse patient population with a wide representation of languages, selection included a commitment to develop a diverse group of students to optimize student and patient experience.

Patient Selection and Referral to DREAM Program

Patient selection and logistics for shadowing (training) DREAM students: DREAM students shadowed a Birth Sister for a prenatal visit, an L&D, and a postnatal visit prior to working independently. Patients had to qualify for the Birth Sister Program and then volunteer to have a DREAM student shadow their Birth Sister for training. The Birth Sister assigned to the patient was responsible for educating the patient about the DREAM Program and determining interest in participation. The Birth Sisters Program Director and the Birth Sisters selected potential participants. Once a patient elected to work with both the Birth Sister and a DREAM student, the Birth Sisters Program Director contacted the DREAM Midwifery Faculty Leader and DREAM General Track Student Leader to facilitate student-Birth Sister partnerships. The Birth Sister's and assigned student's contact information was then shared, and they were responsible for communicating and coordinating appointments to facilitate the shadowing opportunity. The Birth Sister was responsible for communicating updates about the patient and relevant appointments and for notifying the student when the patient was in labor.

Patient selection and logistics for independent DREAM students: Health care providers identified patients who did not qualify for the Birth Sister Program and needed additional labor support and referred them to the DREAM Program. These health care providers included nurses, midwives, and physicians, and they were responsible for educating their patients about the DREAM Service-Learning Program and evaluating patient interest prior to voluntary participation or referral. DREAM Team flyers were posted in the Women's Health Center and on the L&D floor to serve as a program reminder. Once a patient agreed to enroll in the DREAM Program, the health care provider contacted the DREAM Midwifery Faculty Leader, who then assigned a DREAM student to the patient to initiate the student-patient partnership.

When the selected patient was an adult, the Midwifery Faculty Leader and DREAM General Support Track Student Leader worked together to pair an appropriate DREAM candidate for the patient's language needs and due date. When a selected patient was part of the Teens and Tots Program, the Teens and Tots Midwifery Faculty leader worked with the DREAM Teens and Tots Track Student Leader to facilitate student-patient pairing. Independently working DREAM students were paired with an additional DREAM student as backup in the event that the assigned student was unable to attend the L&D. The backup student was ideally in another class year to minimize scheduling conflicts. Once the student-patient assignment was finalized, the Midwifery Faculty Leader updated the patient's electronic medical record (EMR) by adding "DREAM Program Enrolled" to the patient's problem list, with the student's contact information as additional information. The Midwifery Faculty Leader additionally emailed the patient's contact information and estimated due date to the student over secure email. DREAM Student Leaders added clinic appointment dates and times to individual assignment logs and therefore required limited EMR access and patient information to help facilitate labor-support visits. The patient and the care team on L&D were responsible for contacting the DREAM student once the patient was admitted to the floor.

Orientation and Training

Five-hour labor-support educational session: Initial training included a required 5-hour educational session in September led by the DREAM Midwifery Faculty Leader, the Birth Sisters Program Director (a certified nurse midwife), and Birth Sisters at BMC. The DREAM student-founder, a certified doula, oversaw the content. Birth Sisters were required to undergo intensive labor- and social-support training held by BMC to become employed, and many of them had years of experience providing labor support. Orientation outlines and resources (Appendices B & C) were provided by facilitators and educators. DREAM students

were not required to have any prior training and were asked to fill out the preparticipation surveys without using any educational material.

The 5-hour training session was composed of an icebreaker activity, a site-specific presentation on patient demographics and social determinants of health, and five 15-minute small-group breakout sessions on topics of the prenatal visit, normal labor, active labor, pushing, and breast feeding (Appendix B). The breakout sessions were designed to educate students about labor, with an emphasis on student roles and supportive measures during different stages of labor. The training session concluded with a labor video and tour of the L&D floor at BMC. DREAM students had site-specific resources and student-designed educational handouts for reference after the session (Appendix C).

Shadowing a Birth Sister: After completion of the 5-hour labor-support training session, students were required to partner with a Birth Sister for one patient's prenatal visit, L&D, and postpartum visit prior to working independently. This structure was designed to promote interprofessional collaboration and to give students more confidence and competence in providing labor support prior to working independently with a highly vulnerable patient population.

Teens and Tots Program Track-specific education: Students who elected to work in the Teens and Tots Program Track were additionally required to attend educational sessions on student-selected topics related to adolescent health, pregnancy, and parenting. PowerPoint presentations were held roughly every 2 months and led by the DREAM Teens and Tots Faculty Leader (Teens and Tots Program Director). Thus far, we have covered the following topics solely for educational purposes: HEADSS adolescent psychosocial assessment; adolescent pregnancy diagnosis, management, and counseling; and the epidemiology and health disparities of adolescent pregnancy (Appendix D).

DREAM Student Requirements

DREAM student requirements were outlined specifically in the application for the program and reiterated during the information session and orientation of the program (see the DREAM Structure Overview and Program Tracks section, above). Of note, DREAM students were not assigned more than one patient at a time unless otherwise requested by the student. All DREAM students were required to attend the initial orientation session and complete a full shadowing experience with a Birth Sister prior to working independently.

Students were additionally required to communicate and coordinate with their Birth Sisters during the shadowing component of their training. Students who worked independently were responsible for coordination and communication with their patients and care team as necessary. To ensure quality experiences and facilitate appropriate student-client pairing, students were required to update their independent assignment logs, which were viewable by both student and faculty DREAM leaders on a shared Google Drive (Appendix E). An assignment log was created for each student and listed the student's responsibilities step by step. The logs were meant to serve as a student guide in addition to tracking student progress and experience. The General Track Student Leader and Teens and Tots Track Student Leader updated assignment logs with relevant appointments and information for independent student assignments.

Students were strongly encouraged to fill out a provided quality improvement checklist, a pre- and postsurvey, and an electronic open-response experience reflection for program evaluation (details below). Students were required to follow the quality improvement checklist as a communication guide and to fill out a form for every patient experience to improve labor-support staff attendance at L&Ds. The surveys, reflections, and quality improvement checklist were deemed IRB exempt, and students were provided with a handout stating that by voluntarily participating in DREAM, they acknowledged that they would be part of a research and quality improvement study and were willing to meet program requirements.

Students were excused from DREAM-related activities for required classes and exams. However, students were frequently reminded about the unpredictable nature of labor, were assigned a backup, and were encouraged to balance their academics with this extracurricular activity by keeping up with coursework,

studying in advance or in anticipation of a delivery, and receiving guidance from upper-level DREAM Student Mentors. Students provided schedules with required exams and sessions ahead of time and were expected to work around their schedules accordingly to meet with patients. Students were also strongly encouraged to prioritize their primary role as a medical student over DREAM activities if they felt that their participation would jeopardize their ability to pass an exam. It is important to note that the preclinical curriculum during the first 2 years functioned as a pass-fail system, with a large majority of the coursework being nonmandatory video-recorded lectures. A handful of mandatory sessions occurred each week, many of which were repeated on different days to accommodate a large class, with exams held roughly every 2 weeks. Students were expected to communicate with their course director beforehand and/or speak with the course director about the missed session.

Budget and Funding

We financed DREAM via student fund-raising and the OB/GYN Department at BMC. Annual budget considerations included recruitment posters and pamphlets, orientation and training materials including a resource binder, food for group meetings, and group T-shirts (Table). Additional resources in the annual budget included individual student birth bags containing massagers, rice heating-packs, lotion, and aromatherapy oil.

Table. Annual Budget and Resources

Event	Description	Supplies	Quantity	Cost
Activities Fair	New student recruitment	Poster/handouts	1 poster/30 handouts	\$20
Training	4-hour training with Birth Sisters	Food, resource binders	25 people/10 binders	\$200
Meetings	Student check-in	Food	As needed	\$180
Miscellaneous	T-shirts provided to students	T-shirts	32	\$465
	Birth bags provided to students	Birth bags (essential oils, rice pack, lotion, massagers, etc.)	10	\$250
Total annual cost				\$1,115

Leadership

DREAM leadership consisted of at least three students, in addition to midwifery and physician faculty at BMC. MS2 students held leadership positions including one DREAM Teens and Tots Track Student Leader and two DREAM General Track Student Leader roles. MS3 and MS4 students who had previously participated in DREAM held Senior Leader roles by providing mentorship and leading quality improvement projects and data acquisition. Faculty leadership positions included the DREAM Teens and Tots Faculty Leader, led by the Teens and Tots Program Director; the DREAM Midwifery Faculty Leader; and the DREAM Birth Sister Faculty Leader, led by the Birth Sisters Program Director. A detailed overview of the positions and roles is provided below.

Student positions and corresponding roles:

- General Track Student Leader (two MS2 students).
 - New-student recruitment and selection.
 - Present program at service-learning orientation.
 - Organize group meetings.
 - Oversee student logs for General Track.
 - Update assignment logs with appointment information.
 - Send monthly DREAM Program reminders to OB/GYN Department.
 - Fund-raising.
 - Work with Birth Sister Faculty Leader and Midwifery Leader to facilitate student assignments.
 - Distribute educational resources and guide training session content.
 - Infrastructure development, problem solving.
 - Mentorship.
 - Facilitate survey and reflection distribution.
 - Collect quality improvement communication checklist at meetings.

- Teens and Tots Track Student Leader (one MS2 student).
 - New-student recruitment and selection.
 - Present program at service-learning orientation.
 - Organize adolescent educational sessions with Teens and Tots Faculty Leader.
 - Fund-raising.
 - Update assignment logs with appointment information.
 - Oversee Teens and Tots Track student assignment logs.
 - Work with Teens and Tots Track student midwife to facilitate student assignments
 - Distribute educational resources and guide training session content.
 - Mentorship.
- Senior Leader (MS3 or MS4 students).
 - Quality improvement.
 - Data acquisition.
 - Mentorship.

Faculty positions and corresponding roles:

- Midwifery Faculty Leader.
 - Coordinate with DREAM Birth Sister Faculty Leader to facilitate shadowing pairs and training.
 - Colead labor-support training with DREAM Birth Sister Faculty Leader and Birth Sisters.
 - Oversee General Track student assignment logs.
 - Main L&D contact for patient referral to the program.
 - Add “DREAM Program Enrolled” to patient’s EMR problem list.
 - Facilitate L&D and OB/GYN faculty support and involvement.
- Teens and Tots Faculty Leader.
 - Give educational talks on adolescent health based on student selection.
- Birth Sister Faculty Leader.
 - Coordinate with Birth Sisters and DREAM Midwifery Leader to facilitate shadowing.
 - Help identify patients for General Track students.
 - Colead labor-support training with DREAM Midwifery Leader and Birth Sisters.
 - Facilitate quality improvement projects with Birth Sisters.

Program Evaluation

DREAM was evaluated yearly via student-created participation surveys, experience reflections, L&D attendance, and quality improvement metrics. Quality improvement is discussed in the Logistical Considerations and Quality Improvement section, below.

Student metrics included total number of patients worked with, total number of full patient experiences (including prenatal and postpartum visits and any portion of L&D), number of missed L&Ds, and number of independent versus shadowing student experiences.

Pre- and postparticipation surveys were completed electronically using an anonymous Google Form both prior to orientation and at the end of the academic year (Appendix F). To maintain anonymity, unique identifiers based on the first two letters of a student’s mother’s maiden name and day of birth were used to link surveys and were not shared with other participants or facilitators. Surveys were developed to evaluate student confidence in communication, advocacy, and support skills, in addition to assessing general OB/GYN knowledge and attitudes toward labor support and interest in OB/GYN. Confidence in communication, advocacy, and support was assessed through 10 student-designed Likert-scale questions (six questions on communication, two questions on support, and two questions on advocacy). OB/GYN knowledge was assessed through 16 student-selected short-answer questions, for a total possible score of 16 out of 16. Attitudes toward labor support and interest in OB/GYN were assessed through multiple-choice questions.

To further assess program influence, students submitted anonymous written reflections electronically throughout the year using Google Forms (Appendix G).

We selected quotations from written reflections and used paired pre- and postsurveys for program evaluation. A Cronbach's alpha of 1 was used to measure Likert-scale survey-question reliability. Paired *t* tests ($p \leq .05$) comparing average median difference scores were used to analyze Likert-scale-based confidence assessments. A paired *t* test ($p \leq .05$) was used to determine the difference in pre/post OB/GYN knowledge scores of paired surveys.

Logistical Considerations and Quality Improvement

Shared Google Drive for program material: All DREAM service-learning material was shared by program participants and leaders on a Google Drive and followed HIPAA regulations and guidelines. Information accessible on the Google Drive included Birth Sister contact information, student contact information, individual assignment logs, links to online surveys and reflections, quality improvement communications checklist, business cards, educational material, meeting notes, program proposal, expectations, and application. Some of these documents were editable by program leaders, while other participants had view-only access.

Preclinical student access to L&D and recognition as labor-support providers: Preclinical medical students at BUSM did not automatically have ID access to L&D; the program had to request access for the students. DREAM Team flyers were posted near the front desk so that administrators were familiarized with the students. Students were also given student-designed DREAM shirts to wear while providing labor support so that they were recognized as part of the DREAM Team on the floor, instead of as medical students carrying different role expectations.

Improving attendance at L&Ds: A quality improvement study was done to increase labor-support staff attendance at L&Ds and to improve the DREAM student and patient experience. We created a cause-and-effect diagram (Figure 2) and, subsequently, a quality improvement checklist for both Birth Sisters and independent DREAM students to fill out and follow for every patient assignment. This was designed to facilitate effective communication and therefore improve labor-support attendance at L&Ds (Appendix H). Business cards were created as a quality improvement measure to help remind patients to notify their labor-support provider when they went to, or were admitted to, L&D (Appendix I). The communications checklists and business cards were distributed periodically at group meetings and were also available on the service-learning group's shared Google Drive. The checklists were followed as a guide, completed in real-time during patient assignment, and turned over to DREAM Student Leaders once the assignment was completed. DREAM Student Leaders were responsible for collecting the checklists for future quality improvement measures. Quality improvement metrics included percentage of students notified of deliveries and attendance at deliveries.

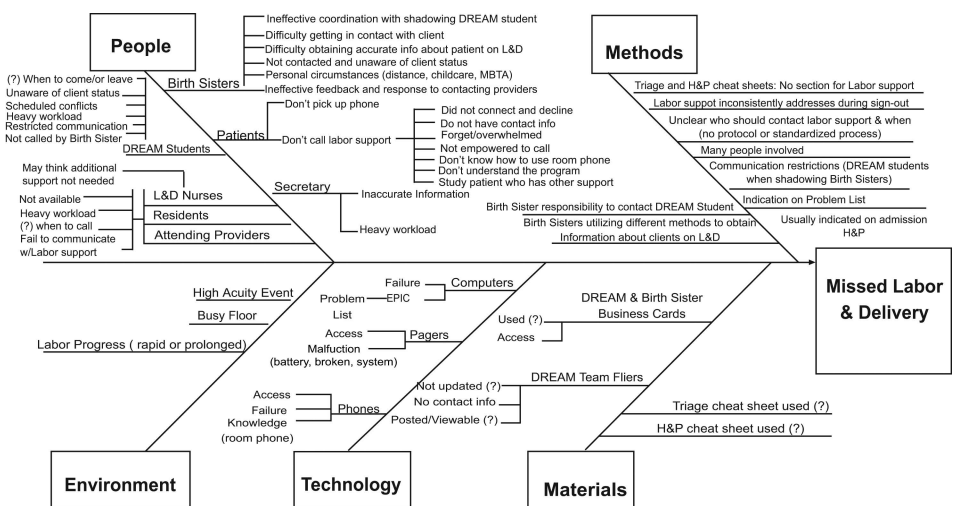


Figure 2. Quality improvement cause-and-effect diagram for missed L&Ds by labor-support staff. Abbreviations: EPIC, EPIC electronic health record system; H&P, history and physical; L&D, labor and delivery; MBTA, Massachusetts Bay Transport Authority.

Results

Learner Characteristics

A total of 15 preclinical medical students participated in DREAM between 2015 and 2017. Seven students (four MS1s and three MS2s) applied and participated during our pilot year (2015-2016). We had a total of 24 applications for 2016-2017, and nine students were selected to participate (seven M1 and two MS3 students), along with two returning pilot-year students. We had one male applicant and participant overall. All selected students had no prior labor-support experience or training and expressed in their applications that they wanted hands-on and meaningful clinical experience. Students exhibited varied levels of interest in the field of OB/GYN, pediatrics, and women's health. Given a diverse patient population at BMC, we selected students representing a range of languages; selected students could speak English, Spanish, French, or Urdu/Hindi.

Expanding Labor-Support Coverage

Between 2015 and 2017, DREAM students worked with 35 patients through shadowing experiences or working independently. Students were present for a prenatal visit, any portion of the L&D, and a postpartum visit for 25 patients; 12 were independent student experiences. Students were unable to attend any portion of the L&D for 10 patients; seven absences occurred while shadowing a Birth Sister, and three occurred while working independently. Overall, students had a 71.4% L&D attendance rate. Known reasons for missed L&Ds included quick labors where both the Birth Sister and DREAM student were not able to arrive in time, ineffective communication between the Birth Sister and DREAM student resulting in the student's absence, and DREAM student misinformation regarding a scheduled induction.

Improving Preclinical Student Confidence and OB/GYN Knowledge

Six out of 15 DREAM students (40%) completed paired surveys, which were used in our analysis. Likert-scale survey questions reliably assessed student confidence, with pre- and postsurvey raw Cronbach's alpha scores of .964 and .812, respectively.

Impact on preclinical student confidence by topic: Median confidence score trends improved for all Likert-scale survey questions on communication, advocacy, and support (Appendix F). However, only average median difference scores for questions relating to communication (questions 9 and 10) had statistically significant findings, suggesting students experienced an improved ability to communicate the benefits of labor support to colleagues, family, and friends (average median difference score = 1, $p = .03$, for both questions; Figure 3).

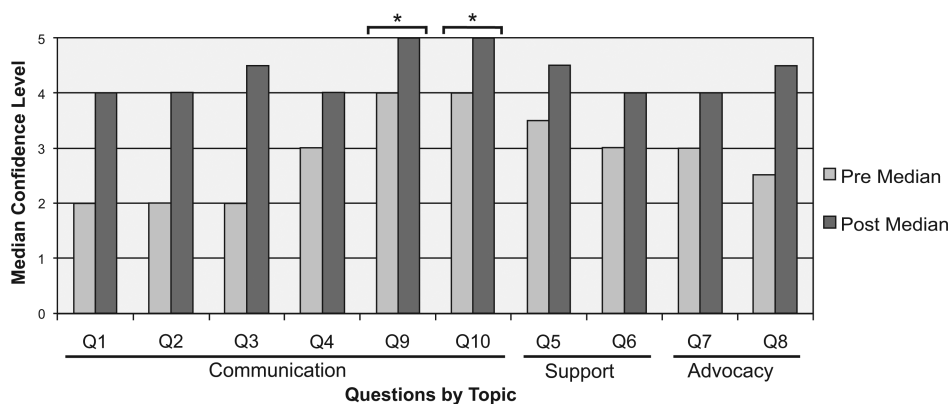


Figure 3. DREAM student paired pre- and postsurvey median scores ($N = 6$ paired surveys) measuring confidence in communication, providing support, and advocacy. Bars indicate presurvey and postsurvey median confidence scores. Median differences were used to determine statistical significance. For all comparisons, $p \leq .05$; asterisk (*) indicates statistical significance. Abbreviation: Q#, survey question number.

OB/GYN knowledge acquisition: All 16 open-ended questions were used to calculate mean OB/GYN knowledge scores ($N = 6$). The mean score for the knowledge-based questions pretraining was 5.00 points out of 16 points total. The mean score for the knowledge-based questions posttraining was 7.67

points out of 16 points total. On average, students' OB/GYN knowledge-based test scores improved by 2.67 points (95% CI, 0.21-5.12; $p = .0383$).

Attitudes Toward OB/GYN and Labor Support

Data collected on student attitudes towards the program are presented in Figure 4. Overall, students maintained their career interests through program participation (question 11), as 66.7% of students were initially strongly considering or certain about pursuing a career in OB/GYN and this did not change through program participation. Median student opinion on whether they would recommend labor support to friends and family (question 12) changed significantly after program participation ($p < .004$) from neutral and likely to likely and very likely, respectively. In the postsurvey, all students but one changed their opinion about labor-support recommendations to their friends and family. Although students did not have a statistically significant change in preference for having a labor-support provider for their or their partner's labor, there was a positive trend from neutral to likely (question 13). Student preferences for wanting an epidural for their or their partner's labor (question 14) also did not change significantly, although 33.3% of program participants changed their preference from initially wanting an epidural for their or their partner's labor to wanting to try without one first. Student attitudes toward recommending alternative pain management to their friends and family (question 15) did not change significantly from program participation. Specifically, 66.7% of participants maintained their initial viewpoint that they would recommend alternative pain management to friends and family. The remaining students changed their recommendation from using an epidural to trying alternative pain management.

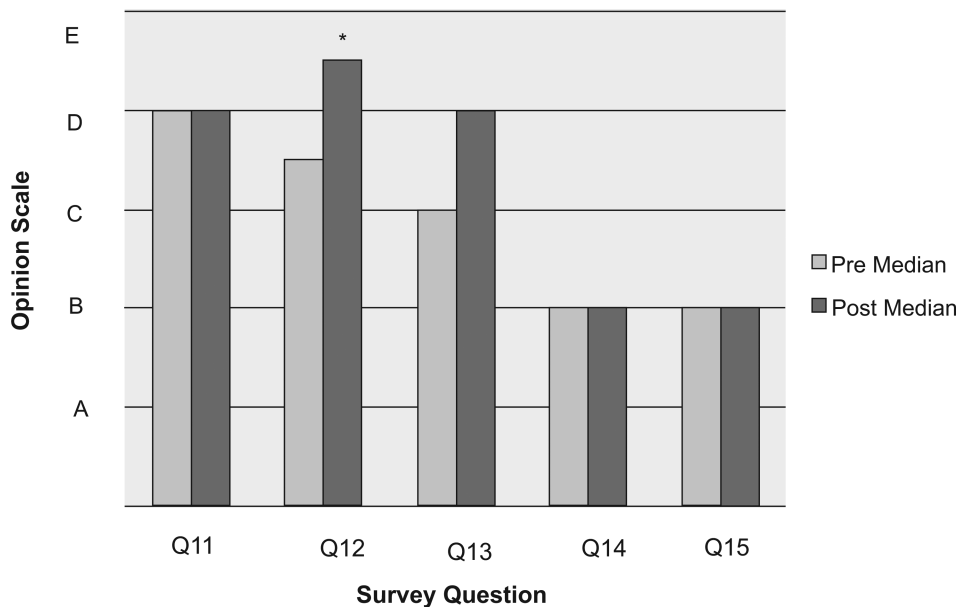


Figure 4. DREAM student paired pre- and postsurvey median opinion and attitude changes ($N = 6$ paired surveys). Opinion Scale letters A-E correspond to answer choice. Q11: To what extent are you considering a career in OB/GYN? A = I am not considering, C = I am considering, E = I am certain. Q12: How likely would you be to recommend labor support/a doula to friends and family? A = extremely unlikely, C = neutral, E = extremely likely. Q13: How likely would you be to use labor support/a doula in your or your partner's birth? A = extremely unlikely, C = neutral, E = extremely likely. Q14: Would you choose to have an epidural during your or your partner's labor and delivery? A = yes, C = no. Q15: Would you recommend an epidural to your family members, friends, and/or patients during their labor and delivery? A = yes, C = no. Bars indicate presurvey and postsurvey median opinion and attitude scores. Median differences were used to determine statistical significance. For all comparisons, $p \leq .05$; asterisk (*) indicates statistical significance. Abbreviation: Q#, survey question number.

DREAM Participation and Academic Performance

Students found that DREAM and its associated responsibilities and unpredictable nature added to stress about their ability to maintain their academic performance. However, they felt that the challenging balance and added stress were ultimately worthwhile given the powerful and gratifying experiences they had

through participation in DREAM. Since most lectures were nonmandatory and video-recorded, students were able watch lectures flexibly and stay caught up with their coursework. Two students reportedly chose to miss a mandatory session to stay with their patients during labor because they felt that it would be educational and gratifying clinically. In these rare instances, students met with their course director to discuss the absence and decide how to make up the missed work. Thus far, students have not received any negative feedback from preclinical faculty, and faculty members have expressed understanding and excitement when hearing about students' meaningful experiences. All students participating in DREAM passed their exams, none of which were missed due to DREAM participation. However, it is important to note that exams occasionally fell before, during, or after a delivery, and students had to balance their studying, sleep, and preparation for their exams with their patient responsibilities. Students understandably felt stressed in this situation and conflicted when trying to balance these demands.

Qualitative Reflections on Student and Patient Experience

Out of 15 participants, five completed written reflections. The following quotations selected from student reflections highlight feelings of gratification, improved confidence, and patient appreciation for the program.

- Quotes on student gratification:
 - “The most selfishly powerful experience for me, was how I felt useful. As medical students I feel like all we do is take, but it was nice to be able to help someone out in a really tangible way.”
 - “I love serving as labor support, I love getting to watch the medical team from a different perspective, and most of all I love being there for women who need it the most. I think over the course of my first year in medical school DREAM has given me some of my most memorable and informing moments thus far.”
 - “My time with my client was so powerful and I will never forget it. I arrived in the labor room and she was back and forth between the bed and bathroom, moaning and trying to get comfortable. She seemed so upset and frustrated by the situation. I sat next to her and at first started rubbing the only part of her body that was easily accessible—her leg. She totally melted, so I proceeded to her back. In no time, I had found some aromatherapy and was giving her long massages. Touch was such a powerful tool for her, and it was so rewarding to be the one to offer it. I learned how to be there in a very personal and intimate way for someone I hardly knew—which is in many ways what being a physician is all about.”
 - “Before doing DREAM, I had no idea what it would be like to follow a patient through the labor process. My first encounter was brief and my rusty Spanish skills prohibited me from interacting with my patient very much, leading me to feel like an outsider as I stepped into the dimly lit room. Formalities surrounding being strangers were instantly forgotten as I got hot packs to rub her back, held her hand during contractions, and helped get her into the shower. My rusty Spanish became irrelevant as ‘tu puedes’ and ‘eres fuerte’ became the go-to phrases. I became increasingly grateful for the experience as the night went on; my client was outwardly appreciative for my support.”
- Quotes reflecting student confidence:
 - “Now, on my OB/GYN rotation, I feel much more comfortable jumping in and helping women and knowing how important support is.”
 - “My client said to me at the end of the experience, you must have done this a ton, you were so great.”
 - “I learned how to be there in a very personal and intimate way for someone I hardly knew—which is in many ways what being a physician is all about. All the data on the importance and efficacy of labor support was vividly brought to life for me.”
- Quotes reflecting patient appreciation for the program:
 - “She told me how meaningful it was to have a medical student there with her, that doctors in her home country are aloof and important and they would never do something like this, and

her husband hadn't believed her when she told him I was going to be a doctor. She was so thankful I had taken the time to be there with her and so was I."

- "I went back and saw my client a few times after she delivered. She lit up when I walked into the room and told me God would bless me for staying with her though the night."

Discussion

We developed DREAM, a novel interprofessional service-learning program and curriculum designed to empower preclinical medical students with labor-support training while simultaneously expanding labor-support coverage at a safety-net hospital whose patients' needs far outweigh current labor-support staff capacity. This resource provides the structural framework, content, and evaluation materials necessary to train and integrate medical students as labor-support resources for vulnerable patients.

DREAM students worked independently and expanded labor-support coverage at BMC by providing labor support for patients who would not have otherwise received it. Students benefited by gaining a fund of OB/GYN knowledge in preparation for their clerkships. Quotations from student reflections indicated that patients greatly appreciated the program and, consequently, the labor support they received.

Participant reflections also highlighted our program's success in promoting early clinical gratification and building student confidence. Students showed statistically significant improvements and changes related to their confidence in describing the medical benefits of labor support and to their viewpoints and recommendations about labor support. Although the remaining survey questions on confidence, OB/GYN interest, and perspectives were not statistically significant, consistently positive trends, coupled with our qualitative data, suggest that the significance of our results was limited due to small sample size. Further limitations of our results include response bias, with few completed paired surveys compared to number of participating students, and not controlling for the quantity or type of experiences (shadowing vs. independent) represented in the postexperience surveys completed at the end of each academic year. Selection bias likely also played a role in influencing OB/GYN attitude results. Although participants showed statistically significant increases in OB/GYN knowledge scores, they improved rather minimally, with a mean score of less than 50%, which could be due to long duration of time between orientation and postexperience surveys and lack of clinical application of tested knowledge.

Interdisciplinary collaboration with the OB/GYN department and with both the Teens and Tots and Birth Sisters Programs at BMC was critical for DREAM service-learning program establishment and has ultimately shaped its curricular structure. Major challenges faced in program development included meeting all departments' expectations for the program, including student training, creating a role and appropriate expectations for medical students given time constraints, and balancing this with Birth Sister labor-support training requirements. Other challenges included promoting effective communication between Birth Sisters and students to facilitate learning experiences. To overcome these challenges, we had frequent group meetings and discussions to share perspectives and solve problems. We heavily involved the Birth Sisters in labor-support training, meetings, and shadowing experiences so they did not feel that medical students were replacing their role by providing labor support but instead were learning from them as experts to competently expand labor-support coverage at the hospital. In this interdisciplinary and graduated education structure, the Birth Sisters Program Director and participating Birth Sisters felt that medical students would be trained sufficiently before working independently with clients.

Other challenges included missing L&Ds and optimal expansion of program capacity. Ineffective communication between patients, labor-support providers, and their care teams likely played a large role in missed L&Ds (Figure 2). Thus, we developed the communications checklist as part of our quality

improvement project to standardize and improve communication and, consequently, attendance at L&Ds. Over the next academic year, we hope to determine the impact of our checklist and quality improvement intervention in improving L&D attendance.

A challenge that DREAM students faced was balancing the unpredictable nature of labor support with a rigorous medical curriculum involving mandatory classes and exams. We attempted to emphasize that students were excused from DREAM activities if these threatened to interfere with the students' ability to meet academic standards, and we established student mentors and backup systems to help mitigate this challenge. Despite these efforts, students still felt stressed trying to meet program expectations and maintain a balance between their academics and patient responsibilities. The exposure and difficulty of having to balance multiple demands through participation in a service-learning group like DREAM will, however, ultimately help better prepare students to successfully meet the many demands of medical residency and practice.

There are many factors to consider in developing a medical student labor-support team regardless of clinical setting and context. While BMC is unique in that it already has an established in-house labor-support team to facilitate medical student training and program structure, this might not be true at other institutions. Any interested faculty member or doula-trained medical student is capable of training medical students with the educational material provided. However, it is important to note that without an already established labor-support team such as the Birth Sisters, creating a program like DREAM would likely require a much greater time commitment from individual leaders or a greater number of supporting faculty. A costlier alternative for training would be to hire an experienced labor-support educator to lead educational sessions per academic year. In a clinical context without an established labor-support team like the Birth Sisters, students would likely not have the benefit of a shadowing experience to gain hands-on experience prior to working independently. In this circumstance, students could alternatively spend time observing births and labors for prior, although different, exposure.

Other considerations for creating a labor-support team regardless of clinical context include developing specific program-referral criteria based on institutional needs given finite labor-support capacity and adding to criteria for pairing students with program-referred patients. For example, one could consider pairing a student with a patient based on speaking a shared language or because a student had a schedule compatible with a patient's due date. Informing OB/GYN care-team providers about the labor-support team, program-referral criteria, and patients enrolled in the program and fostering their communication and collaboration with the labor-support provider are essential to program success and are likely most effectively done by adjusting patient medical records.

For future DREAM Program project development, we aim to collect additional survey data to better characterize the impact of this service-learning program on student confidence and learning. We plan on modifying training material in the upcoming year to better address content deficits displayed by student surveys. Further investigation areas of interest include the program's impact on student burnout and birth outcomes.

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Acknowledgments

Special thanks to Conor Duffy, MPH, who performed data analysis for this publication, and to Brittany Diaz, CNM, the current DREAM Faculty Midwifery Leader.

Disclosures

None to report.

Funding/Support

None to report.

Prior Presentations

Shakartzi H, Pierre-Joseph NP, Rodrigues D, et al. DREAM: empowering preclinical medical students with labor support training. Oral abstract presented at: Counsel on Resident Education in Obstetrics and Gynecology and Association of Professors of Gynecology and Obstetrics Annual Meeting; March 11, 2017; Orlando, FL.

Ethical Approval

This publication contains data obtained from human subjects and received ethical approval.

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Received: June 18, 2017 | **Accepted:** December 8, 2017 | **Published:** January 4, 2018