

Original research article

Team-based learning: a novel approach to medical student education in family planning[☆]Sheila K. Mody^{a,*}, Jessica Kiley^a, Lori Gawron^a, Patricia Garcia^b, Cassing Hammond^a^aDepartment of Obstetrics and Gynecology, Section of Family Planning and Contraception, Northwestern University, Chicago, IL 60611, USA^bDepartment of Obstetrics and Gynecology, Division of Maternal Fetal Medicine, Northwestern University, Chicago, IL 60611, USA

Received 24 February 2012; revised 19 July 2012; accepted 20 July 2012

Abstract

Background: Medical schools are increasingly using team-based learning (TBL). We compared medical student satisfaction and understanding of key concepts in family planning following TBL and traditional lectures.

Study Design: During the OB/GYN clinical rotation orientation, third year medical students completed a pretest in family planning. Students in the odd-numbered clerkships participated in TBL, and students in the even-numbered clerkships participated in lectures. Both groups of students completed a posttest and satisfaction survey.

Results: A total of 130 students participated in this study. Sixty-nine students were in the TBL group, and 61 students were in the lecture group. The TBL group reported higher scores when asked if the learning style was a valuable experience ($p=.045$), helped them learn the course material ($p=.01$) and improved problem-solving skills ($p=.04$). Both groups gained significant amount of knowledge ($p<.001$) as calculated by the Student's paired t test. The change in scores was not significantly different between the groups ($p=.73$), as calculated using the Student's unpaired t test.

Conclusion: As a learning strategy for family planning, TBL resulted in high student satisfaction. This is the first study to evaluate this innovative teaching style for medical student education in family planning.

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Keywords: Team-based learning; Medical student; Education; Curriculum

1. Introduction

Team-based learning (TBL), originally described in business school curricula, has steadily increased in use in health sciences education over the last decade [1]. TBL promotes active learning within a group of students, consisting of three phases. In phase 1, students complete assignments outside of class, such as textbook readings. Students are held accountable for completion of these assignments in phase 2, when the entire group of students meet. In phase 2, students take readiness assurance tests (RATs), first individually (IRAT) and then in assigned small groups (GRAT). In phase 3, students in the assigned teams confer to

solve complex problems [2]. The activities in phase 3 stimulate active participation [3]. Benefits of TBL include maximizing student engagement and class preparedness [4,5], improved teamwork and communication skills [3,6,7], better problem-solving skills [8] and improved knowledge outcomes [5,9].

Use of TBL in medical school curricula has taken place mostly in the coursework of the first 2 years in basic science courses [8,10–14]. One group reported positive outcomes with implementation of TBL in a psychiatry clinical clerkship. TBL increased the students' enjoyment of teamwork, students were more highly engaged in learning activities, and scores on the National Board of Medical Examiners psychiatry subject test were significantly higher for students exposed to TBL compared to those undergoing a traditional curriculum [9].

Family planning spans numerous medical specialties, including internal medicine, pediatrics, family medicine, and obstetrics and gynecology. In the United States, 43 million women (7 in 10) of reproductive age are sexually active and

[☆] There was no funding provided for this study.

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do not wish to become pregnant [15]; this statistic illustrates significant demand for birth control services. For doctors in training, understanding the management of contraceptive services is critical, and for educators, developing high-impact curricula for teaching family planning is necessary. While innovative methods for augmenting medical student education of contraceptive modalities during OB/GYN rotations are needed and desired [16,17], few studies have evaluated novel educational techniques. Furthermore, the few studies evaluating new techniques have failed to demonstrate favorable results [18–20]. While TBL is steadily being incorporated into medical schools, it has not been adopted in OB/GYN clerkships. We initiated a novel application of TBL for the teaching of family planning topics during the third year OB/GYN clinical rotation.

2. Materials and methods

This study was conducted at Northwestern University, Feinberg School of Medicine, from July 2010 to June 2011. The study was approved by the Northwestern University institutional review board. The participants were third year medical students rotating at Prentice Women's Hospital and Stroger County Hospital, Chicago, IL. Recruitment took place during orientation for the OB/GYN rotation. Participation was voluntary. Students were informed that participation did not impact rotation grades.

Each 6-week rotation, students were assigned to TBL or traditional lectures. There were approximately 27 students in each 6-week rotation. Students in the odd-numbered rotations (1, 3, 5) received TBL, and students in the even-numbered rotations (2, 4, 6) received traditional lectures. During the OB/GYN rotation orientation, all of the students completed a 10-question multiple-choice pretest that took approximately 15 min. This test was developed by physicians from Northwestern's Section of Family Planning & Contraception. The topics included (a) contraceptive efficacy, (b) injectable contraceptive, (c) intrauterine devices, (d) medical abortion, (e) surgical abortion, (f) emergency contraception, (g) contraceptive implants, (h) unintended pregnancy rate, (i) postpartum contraception and (j) sterilization. None of the students were permitted to keep the pretest. The students in the TBL group were given independent reading material related to family planning as an integral part of the TBL curriculum. The traditional lecture group was not given the family planning reading material since it is not a part of standard curriculum. During the second half of their OB/GYN rotation, students participated in the assigned family planning TBL or lectures. The students then completed a posttest identical to the pretest and a satisfaction survey. The posttest and satisfaction survey were given at the end of the TBL sessions or traditional lectures in the same classroom.

The TBL reading packet consisted of core peer-reviewed articles presenting current information on key contraceptive

topics, and students were given a minimum of 1 month to review the readings. The articles were selected by and TBL sessions were taught by Northwestern's Section of Family Planning & Contraception faculty, who are academic physicians specializing in family planning. Each participant completed the IRAT, consisting of 10 case-based, multiple-choice questions. These cases were based on the Curricula Organizer for Reproductive Health Education created by the Association of Reproductive Health Professionals [21]. The Curricula Organizer for Reproductive Health Education is a collection of peer-reviewed, evidence-based teaching materials. The students were divided into four small groups of five to six students. Each small group completed the GRAT which consisted of the same 10 questions. Each small group completed an Immediate Feedback Assessment Tool card which was scored. All of the small groups had an opportunity to challenge any answer. If a small group could appropriately defend a different answer, the group received additional points. The small group with the highest score was identified. The IRAT/GRAT was then reviewed using slides that reinforced fundamental learning goals. These slides were created utilizing the Curricula Organizer for Reproductive Health Education [21]. The same case-based questions and the same slides were used with each TBL group for consistency.

The next part of the TBL was the group application exercise, which included four sections. The first section required each small group of students to select a short-acting method of contraception. Each small group of students was given 5 min to develop a mini-presentation; then each small group of students taught the other TBL students about the method. The second section had small group of students choose a long-acting reversible method of contraception. Again, the group was given 5 min to develop a mini-presentation, and then each small group presented to the larger group of TBL students. The third section involved a scenario of a patient presenting for a first-trimester abortion. Each small group of students was asked to decide whether she was eligible for medical versus surgical abortion and to complete a mock patient consent/patient instruction form. The fourth section involved a patient scenario for sterilization consultation. Again, each small group of students was asked to decide which method of sterilization (laparoscopic or hysteroscopic) it would recommend, defend its choice and complete a mock patient consent/patient instruction form.

The students in the traditional lecture group had lectures by the same faculty members conducting the TBL sessions. The same slides were used for each traditional lecture group. The content was the same as the slides included for the TBL group review of the IRAT/GRAT questions. The students in the traditional lecture group were not given the packet of family planning reading at their orientation.

The primary outcome was student satisfaction. Students were given a satisfaction survey after they completed the TBL sessions or lectures. Satisfaction scores were measured using three satisfaction questions and a Likert 5-point

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