
An Evaluation of US Medical Schools' Reproductive Health and Family Planning Curricula

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ABSTRACT:

Background and Objectives: Knowledge and competency in the topics of reproductive health and family planning are important for primary care physicians. Given the high rates of unintended pregnancy, increasing rates of infertility and other gynecologic conditions, it is important for medical students, many of whom will become primary care physicians, to receive good foundational knowledge of reproductive health topics. The objective of this research project was to investigate the current curricula at US medical schools to determine the breadth and extent of education that medical students receive in reproductive health.

Methods: Medical students and faculty at 20 US medical schools shared all relevant materials from their required reproductive health curriculum used between 2016-2019, including syllabi, PowerPoint

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lectures, and official class handouts that were available to all students. From these, the number of mentions of 69 reproductive health-related terms were counted, including those related to family planning methods, abortion, ectopic pregnancy, reproductive counseling, and infertility.

Results: Of the over 9000 mentions of reproductive health terms, approximately half of mentions were related to family planning, with 10% related to abortion, 10% to infertility, and 6% to reproductive counseling. Family planning strategies emphasized oral contraceptives and long-acting reversible contraceptives with limited mentions of natural or fertility awareness-based methods.

Conclusions: This data demonstrates opportunities for broadening reproductive health education in medical school so that future primary care physicians are prepared to discuss the full range of reproductive options for their patients.

Presentations: This study was presented as a poster at Family Medicine Education Consortium (FMEC) Conference in Lancaster, PA, November 2019. Preliminary data was presented as a paper at the FMEC Conference in Rye Brook, NY in November 2018.

Conflict Disclosures: The authors are members of the group Fertility Appreciation Collaborative to Teach the Science (FACTS), a network of physicians, medical professionals, residents, and students whose mission is to educate current and future medical professionals about evidence-based fertility-awareness methods of family planning in medical education.

Acknowledgments: The authors wish to thank Erin Kay, DO for her assistance with manuscript preparation; Wendy Madigosky, MD, MSPH for her insight and suggestions; and the medical students who contributed to data collection including Danielle Lukish, Conor Bradley, Madilyn Tomaso, and Ana-Maria Dumitru.

Key Words (2-6): Medical education; Reproductive health; Family planning; Contraception; Infertility; Fertility-awareness based methods.

Introduction

Reproductive health and family planning are increasingly important public health topics in the United States. Recent data shows that 45% of US pregnancies are unintended.¹ Furthermore, although abortion incidence dropped 19% between 2011 and 2019, with rates now below what they were in 1973, nearly a quarter of a million abortions were performed in 2019.^{2,3} In addition to high rates of unplanned pregnancy, there are

also high rates of infertility as individuals increasingly choose to have children later in life. Between 2015-2019, 12% of women aged 15-44, or 7.3 million women, have used infertility services, with at least 2.2% of these women using assisted reproductive technology or artificial insemination.⁴ One study found that up to 40% of women are unfamiliar with the ovulatory cycle and 1/3 do not recognize risk factors for infertility.⁵ Furthermore, the first point of contact for most women dealing with infertility is likely their family physician or generalist practitioner.⁶ As these statistics suggest, it is important for medical students, many of whom will become family physicians or obstetrician-gynecologists, to receive good foundational knowledge of family planning options, counseling, infertility, and other reproductive health topics during medical school.

Little is known about exactly what medical students are taught in family planning in their preclinical and clinical years, but significant variation has been noted in the quantity and quality of the reproductive health curriculum.⁷ Some schools have taken the initiative to standardize and enhance their sexual health curriculum with longitudinal objectives,⁸ but this has not been widely publicized for most institutions. Most conclusions on sexual education in medical school are drawn from student surveys. Some surveys have focused on assessing medical student knowledge; for example, a survey of US medical students found significant disparities in knowledge about sexual health, with the lowest knowledge scores seen in safety and prevention.⁹ Other surveys have focused on student perception of what is included in the medical school curriculum, including a student survey that demonstrated large variation of abortion education in medical school curricula,¹⁰ and another survey of Medical Students for Choice student coordinators which found significant variation in perception of the inclusion of different contraceptive methods and elective abortion in preclinical education.¹¹ In other surveys, students identified that family planning and options counseling were major gaps in the reproductive health curriculum, and that students taking family planning electives felt it was important to take these courses to fill in those gaps.^{12,13}

These former studies have relied on student perception of the reproductive health curriculum, but we are not aware of any prior study which examines the curriculum materials themselves for coverage of reproductive health and family planning topics. The objective of this research project was to investigate the current curricula at US medical schools to determine how much education future physicians receive in family planning and reproductive health. We hypothesized that there would be significant emphasis on pharmacologic methods of birth control, with less emphasis on other forms of family planning or infertility.

Methods

In this study, we examined the reproductive curriculum at medical schools by a novel objective approach. Senior medical students and faculty involved in teaching reproductive health-related courses and clerkships from 91 medical schools were contacted to participate in this study, creating a convenience sample of US medical schools with an effort to include a geographically diverse array of allopathic, osteopathic, public,

and private schools. Since the study design required collection of all updated curricula material related to reproductive health, the response rate was limited by student access to current course content. Ultimately, students and faculty from 20 different schools provided official course syllabi, objectives, PowerPoints, and handouts for reproductive health-related courses that were required of all students in the first through third years. Pre-clinical course materials had to be related to reproductive health/physiology, human sexuality, reproductive pharmacology, family planning, gynecology, and infertility. Formal curriculum materials from the family medicine and OB/GYN clerkships were also requested from the clinical years. Materials not considered for this study include informal presentation or discussion notes, textbooks, or optional online modules. All materials came from the 2016-2019 academic years, such that the documents gathered should represent all the required reproductive health-related curriculum a medical student would encounter at that institution. The authors and students volunteering to assist with the study were trained to follow a standard protocol to analyze the curriculum materials. Materials and data were stored in a password-protected online storage platform.

Once all the relevant materials were gathered, each document was systematically scanned for mentions of terms from a pre-determined list of 69 reproductive health and family planning-related terms. The list of terms was drawn from the Association of Professors of Gynecology and Obstetrics (APGO) guidelines for education and curricula as outlined by Steinaur et al. with additional terms from Beckmann's Obstetrics and Gynecology textbook.^{11,14} For each school's curricula, two independent reviewers analyzed the curricula to ensure consistency. In addition, a standardized training video was provided to the reviewers detailing the process for data collection. Those reviewing the materials could use functions such as "Control F" to find the relevant terms in each document, but would also visually inspect the document for tables or graphs that may not be recognized through those methods. Additionally, reviewers were encouraged to use their best judgment for more complex terms, such as those that had multiple words (e.g. "contraception counseling"). The number of mentions for all terms were totaled and recorded separately for each institution, but all data was analyzed and presented in aggregate to maintain school anonymity. This study received IRB exemption through Georgetown University and a non-human subjects research determination through the University of Colorado.

Results

Curriculum data was obtained from 20 accredited US medical schools, including 16 allopathic schools and 4 osteopathic schools. This represents approximately 10.5% of the 152 accredited allopathic and 38 recognized osteopathic schools in the U.S.^{15,16} There were an equal number of private and public schools represented (n=10 each), and 3 schools were affiliated with Catholic universities. The geographic makeup of the schools included was as follows: 45% from the Midwest, 25% from the Northeast, 25%

from the South, and 5% from the Western US. In total, 9,308 mentions of the 69 reproductive health terms were tallied from all schools. The major categories of these terms and their respective number of mentions are shown in Table 1.

For all terms studied, the largest category of mentions was related to specific types of family planning (43%), while approximately 28% of mentions were for generic terms such as “menstrual cycle” or “birth control.” Interestingly, it was far more common for schools to use the term “contraception”(54%) rather than “family planning” (2.6%) or “birth control” (5.4%). The third largest category, elective abortion procedures, represented 10.4% of all mentions, while 9.5% of all mentions were related to infertility or its treatment approaches. Reproductive health counseling terms made up 5.8% of all mentions, the majority of which pertained to elective abortion counseling (53%); whereas, counseling on adoption or parenthood represented only 2.8% and 2% of mentions respectively. Ectopic pregnancy-related terms only made up 3.5% of all mentions, and infertility terms made up only 9.5% of all mentions (Table 1).

As seen in Table 1, of all family planning methods, medical school curricula primarily emphasized hormonal methods of birth control (41.5% of all specifically named family planning methods) and long-acting reversible contraceptives (LARC) (26.7%), together making up nearly 70% of family planning term mentions. Table 2 further illustrates the breakdown of family planning and elective abortion mentions by specific methods, as well as how many schools mentioned each type. Hormonal contraception mentions were dominated by oral contraceptive pills (OCPs), with fewer mentions of patches, rings, or injectables though all of these methods were mentioned in at least 90% of schools. LARC mentions were primarily made up of intrauterine devices (IUD) followed by implants, and likewise were mentioned in at least 90% of schools. Barrier methods, which made up 15.7% of all family planning method mentions, primarily emphasized male condoms, but specific types of barrier methods outside of condoms were variably mentioned between 50-75% of schools. Observational or fertility-awareness based methods (FABM) made up ~4% of all family planning mentions. When mentioned, FABMs were more likely to be referred to generally or to use older terms such as “rhythm method” instead of modern, evidence-based methods such as the Billings Ovulation Method, Sympto-Thermal Method, Creighton Model or Marquette. Specifically named methods were only mentioned in 20-35% of schools. Finally, female sterilization was mentioned more frequently than male sterilization and were both seen in 80% of school curricula.

Discussion

This study demonstrates that medical school reproductive health education places a large emphasis on pharmacologic methods of birth control and LARCs with limited mentions of counseling, alternative methods of family planning, or infertility. Similar findings were seen in a survey of Medical Students for Choice groups at US medical schools, who likewise identified an emphasis on hormonal contraception and limited

Table 1. Number of mentions of reproductive health and family planning terms in the curricular materials of 20 US medical schools.

	Mentions No (% of category)	Total No (% of N total)
Key Words and Phrases		2,569 (27.6)
Menstrual cycle	593 (23.1)	
Contraception	1,379 (53.7)	
Family planning	67 (2.6)	
Birth control	116 (4.5)	
Adverse/side effects of contraceptives	239 (9.3)	
Ethics of contraception, abortion, or infertility	59 (2.3)	
Pregnancy options	36 (1.4)	
Hysterectomy	80 (3.1)	
Counseling		541 (5.8)
Contraception	89 (16.5)	
Elective abortion	287 (53.0)	
Miscarriage management	42 (7.8)	
Adoption	15 (2.8)	
Parenthood	11 (2.0)	
General reproductive “counseling”	97 (17.9)	
Family Planning Categories		4,029 (43.3)
Abstinence	66 (1.6)	
Fertility awareness-based methods	179 (4.4)	
Barrier	631 (15.7)	
Emergency	179 (4.4)	
Hormonal (pill, patch, ring, injection)	1,674 (41.5)	
Long-acting reversible contraception (IUD, implant)	1,076 (26.7)	
Sterilization	224 (5.6)	
Elective abortion		964 (10.4)
Medical (RU-486, abortion pill)	144 (14.9)	
1 st trimester surgical (vacuum aspiration, D&C)	94 (9.8)	
Late-term elective abortion (D&E, D&X)	24 (2.5)	
Post-abortion care	13 (1.3)	
General mention of “elective abortion”	689 (71.5)	
Ectopic pregnancy		323 (3.5)
Medical/methotrexate management	37 (11.5)	
Surgical management (salpingotomy/tube removal)	25 (7.7)	
General mention of “ectopic pregnancy”	261 (80.8)	
Infertility and Fecundity		882 (9.5)
Artificial reproductive technology (ART)	85 (9.6)	
Artificial/intrauterine insemination	70 (7.9)	
In vitro fertilization (IVF)	123 (13.9)	
Natural procreative technology	2 (0.2)	
General mention of “infertility”	602 (68.3)	
		N = 9,308

mentions of reproductive ethics or counseling on contraception, abortion, infertility, or pregnancy options. In fact, counseling in these categories were not mentioned in over 50% of schools.¹¹ This suggests medical students will go into practice being well-equipped to dispense contraceptives, but lack the art of understanding the patient and providing proper counseling on options, risks, benefits, and alternatives that are pertinent to her given situation in life.

The emphasis on pharmacologic birth control is similarly seen in current trends of contraceptive use, with recent Centers for Disease Control survey data indicating that of the 65% of women currently using a contraceptive method, the leading method was OCPs followed by sterilization and condoms.^{17,18} Interestingly, despite LARCs being one of the most effective methods of birth control, as well as one of the most frequently mentioned methods in medical school curricula according to our study, it only recently became the fourth most common contraceptive method among US women, supplanting vasectomy.¹⁸

The findings of this study suggest that students may be prepared to recommend LARCs and hormonal contraception with their patients but may be less prepared to discuss or offer other family planning methods since they may not learn about them as frequently in their medical education. In particular, our study demonstrates that students rarely hear about fertility awareness-based methods of family planning and individual evidence-based methods, including the Billings Ovulation, sympto-thermal or Marquette methods, are almost never mentioned. Indeed, only one previous study has looked at knowledge of fertility-awareness based methods among medical students during their OB/GYN rotation.¹⁹ Although statistically a less common family planning method, according to the National Survey of Family Growth over 21% of women report using a calendar, temperature, or cervical mucus-based family planning method at some time in their life and of women currently using a family planning method, 3% are using an FABM.^{17,18,20} Additionally, two large surveys of reproductive-aged women found that when women learn about FABMs, 22-61% express interest in using these methods for family planning purposes, either to achieve or prevent pregnancy.^{21,22} Finally, given the lack of education medical professionals receive on all forms and aspects of family planning methods, the question arises whether informed consent can truly be obtained as the clinicians may not provide the patient with comprehensive information about their family planning options.

This study also demonstrated that students encounter relatively few mentions of approaches to infertility treatment and rare mentions of counseling on adoption, miscarriage, or parenthood. Increased attention to infertility in the medical school curriculum would improve not only patient treatment, but could also improve physicians' own personal health knowledge given the high rates and particular challenges of infertility among physicians.²³

Although this study is the first we know of to provide an objective and quantitative assessment of the medical reproductive health curriculum, there are some notable limitations. The sample size is small relative to the total number of US medical schools and

Table 2. Number of mentions of family planning methods and elective abortion in the curricular materials of 20 US medical schools and the percentage of schools mentioning each.

	Total mentions in all schools No (% of category)	Number of schools mentioning No (% out of 20 schools)
Elective abortion		
General mention of "elective abortion"	689 (71.5)	14 (70.0)
Medical abortion	144 (14.9)	12 (60.0)
1 st trimester surgical	94 (9.8)	9 (45.0)
Late term elective	24 (2.5)	6 (30.0)
Post abortion care	13 (1.3)	5 (25.0)
Sterilization		
Female sterilization (tubal ligation)	138 (61.6)	16 (80.0)
Male sterilization (vasectomy)	86 (38.4)	16 (80.0)
Long-acting reversible contraceptive (LARC)		
General mention of "LARC"	111 (10.3)	15 (75.0)
IUD (copper, levonorgestrel)	719 (66.8)	20 (100)
Implant (Nexplanon, Implanon)	246 (22.9)	18 (90.0)
Hormonal contraception		
General mention of "hormonal contraception"	252 (15.1)	12 (60.0)
OCP (progestin-only, combined)	786 (47.0)	20 (100)
Patch	234 (14.0)	18 (90.0)
Ring	212 (12.7)	18 (90.0)
Injectable (Depo-Provera or combined)	190 (11.4)	19 (95.0)
Barrier		
General mention of "barrier method"	52 (8.2)	10 (50.0)
Male condom	207 (32.8)	18 (90.0)
Female condom	56 (8.9)	13 (65.0)
Diaphragm	95 (15.1)	15 (75.0)
Cervical cap	42 (6.7)	10 (50.0)
Sponge	50 (7.9)	14 (70.0)
Spermicide	99 (15.7)	14 (70.0)
Withdrawal	30 (4.8)	13 (65.0)
Observational Methods		
General mention of "Fertility-awareness based methods"	35 (19.6)	11 (55.0)
General mention of "natural family planning"	26 (14.5)	8 (40.0)
Lactational amenorrhea	25 (14.0)	9 (45.0)
Two day method	22 (12.3)	7 (35.0)
Rhythm method	17 (9.5)	9 (45.0)
Calendar method	10 (5.6)	4 (20.0)
Standard Days method	8 (4.5)	6 (30.0)
Creighton method	7 (3.9)	4 (20.0)
Marquette/Sympto-hormonal method	7 (3.9)	5 (25.0)
Billings Ovulation method	6 (3.4)	4 (20.0)
Sympto-thermal method	6 (3.4)	4 (20.0)
Other named observational method	10 (5.6)	8 (40.0)

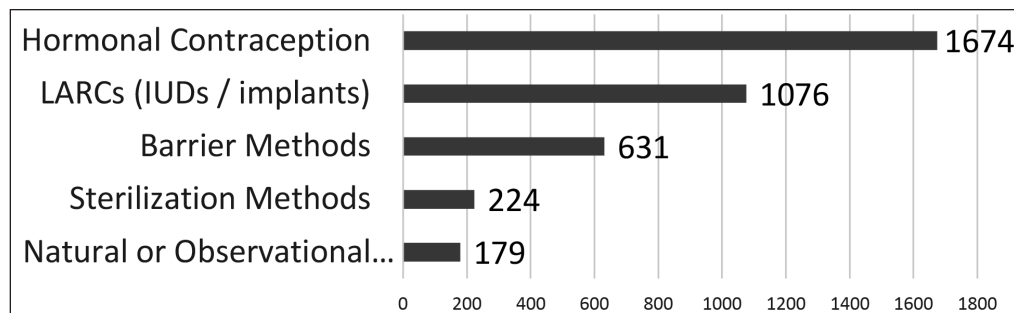


Figure 1. Number of mentions of family planning methods by category.

geographically favored the Midwest. Additionally, misspellings, alternative spellings, or brand names (for example, we did not look for OCP brand names) cannot be totally accounted for, despite our best efforts. Furthermore, it is difficult to assess the significance given to a topic based solely on the number of mentions of the term in written course materials and it is important to note that the number of mentions does not equal the adequacy of education. Nonetheless, hormonal contraception was mentioned nine times more and LARCs were mentioned six times more than FABMs as shown in Figure 1, which highlights the different levels of emphasis given to various forms of family planning.

We also acknowledge that the curriculum structure at different schools can vary significantly. Some institutions have begun to evaluate alternative team or problem-based learning approaches to improve education in family planning, which would not have been evaluated in our study.^{24,25} Along similar lines, it is notable that when looking at the percentages of schools mentioning various terms in written materials, the percentages did not add up to 100% as often as would be expected. While every school curriculum we examined did cover family planning to some extent, for the very few schools whose written materials did not mention terms such as tubal ligation or condom, it is likely these schools covered these common topics in a different format. Additionally, it is important to note that for any term which may appear to receive limited time in the classroom, medical students may encounter these terms on clinical rotations or elsewhere. Finally, many of the students, who participated in the study were members of the Fertility Appreciation Collaborative to Teach the Sciences (FACTS) Student Ambassador program, which is a project of the Family Medicine Education Consortium (FMEC), a northeast based organization. As such, the majority of these students were based in the northeast and midwest, resulting in limited access to course materials from schools located on the west coast.

Despite these limitations, this study also has several strengths, namely that it provides a quantitative analysis of reproductive health curricula from a relatively diverse group of medical schools. It seems a reasonable assumption that terms which are fre-

quently mentioned in written curricular materials are probably frequently mentioned in a live classroom and frequently tested. Likewise, terms that receive limited mentions or no mentions at all in the curriculum are unlikely to be reinforced for students. Therefore, we hope that this study shows opportunities for medical school faculty to broaden their curriculum and ensure their graduates are well educated in all aspects of reproductive health.

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