Published in final edited form as:

J Adolesc Health. 2012 April ; 50(4): 383–388. doi:10.1016/j.jadohealth.2011.07.014.

Medication abortion knowledge among adolescent medicine providers

Mandy S Coles, MD, MPH¹, Kevin K Makino, BA², and Rachael Phelps, MD³

¹Division of Adolescent Medicine, University of Rochester, Rochester, NY

²Department of Community & Preventive Medicine, University of Rochester, Rochester, NY

³Planned Parenthood of the Rochester/Syracuse Region, Rochester NY

Abstract

Purpose—Adolescents are at high risk for unintended pregnancy and abortion. The purpose of this study is to understand if providers caring for adolescents have the knowledge to counsel accurately on medication abortion, a suitable option for many teens seeking to terminate a pregnancy.

Methods—Using an online questionnaire, we surveyed US providers in the Society for Adolescent Health and Medicine on medication abortion. We conducted chi-squared analyses to evaluate medication abortion knowledge by adolescent medicine fellowship training, and to compare responses to specific knowledge questions by medication abortion counseling. Further, we examined the relationship between providers' self-assessed and actual knowledge using ANOVA.

Results—We surveyed 797 providers, with a 54% response rate. Almost a quarter of respondents incorrectly believed medication abortion was not very safe, 40% misidentified that it was <95% effective, and 32% did not select the correct maximum recommended gestational age (7–9 weeks). Providers had difficulty identifying that serious complications of medication abortion are rare. Those who counseled on medication abortion had more accurate information in all knowledge categories, except for expected outcomes. Medication abortion knowledge did not differ by adolescent medicine fellowship completion. Less than a third of respondents had very good knowledge, and self-assessed knowledge minimally predicted actual knowledge ($r^2=0.08$).

Conclusions—Knowledge regarding medication abortion safety, effectiveness, expected outcomes, and complications is suboptimal even among adolescent medicine fellowship trained physicians, and self-assessment poorly predicts actual knowledge. To ensure pregnant teens receive accurate counseling on all options, adolescent medicine providers need better education on medication abortion.

© 2011 Society for Adolescent Medicine. Published by Elsevier Inc. All rights reserved.

Contact information for corresponding author: Mandy Coles, MD, MPH, 601 Elmwood Avenue, Box 690, Rochester, NY 14642, 585-273-4616 (tel), 585-244-9733 (fax), mandy_coles@urmc.rochester.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

The results of this study were presented as a poster at the 2011 Society for Adolescent Health and Medicine Annual meeting.

Implications and Contribution

Providers caring for adolescents have limited knowledge on medication abortion safety, efficacy, expected outcomes, and complications. As medication abortion is an acceptable and effective option for teens facing unintended pregnancy, adolescent medicine providers need to be better informed on issues related to medication abortion to provide accurate options counseling.

Keywords

Medication abortion; Adolescent medicine; Pregnancy options counseling; Provider behavior; Provider knowledge

Background

750,000 adolescents in the United States become pregnant each year¹ and more than 80% are unintended;² almost a third of teens choose not to continue their pregnancies.¹ Adolescents have had the option to end a pregnancy with either medication or an in-office procedure since 2000, when the US Food and Drug Administration (FDA) approved mifepristone. Medication abortion most commonly uses a combination of mifepristone, an anti-progesterone, and misoprostol, a prostaglandin that induces cervical softening and contractions, to chemically induce a miscarriage. This regimen has been FDA approved through seven weeks gestation, though studies have demonstrated efficacy up to nine weeks gestation and beyond.³

In 2007, medication abortion accounted for 14% of all abortions and 21% of all eligible abortions before nine weeks' gestation in the United States⁴ – with trends suggesting that delivery of this service will continue to increase.⁵ Although this is a relatively small fraction of terminations, it can take years for new treatments to be fully integrated into routine practice. In Europe, where mifepristone was first used in 1988, it now accounts for more than half of all early abortions.⁶ While there are no published data on the frequency of medication abortion use by adolescents in the United States, studies have shown that the teens choosing this type of termination are satisfied with the process and have good outcomes.⁷ Common reasons that women choose medication abortion are wishes to avoid surgery or general anesthesia, perceptions that using medication is safer and more natural than a surgical procedure, and desires for increased control over the process.⁸

Because adolescents are at high risk for unintended pregnancy and are the age group most likely to choose abortion when faced with pregnancy,⁹ it is critical that clinicians caring for adolescents are able to counsel pregnant patients on all of their options: parenthood, adoption, and abortion—both medication and surgical. While this is required knowledge of all physicians certified as adolescent medicine subspecialists (by the American Boards of Pediatrics, Family Medicine, and Internal Medicine),¹⁰ these are expectations of all providers who spend a significant amount of time caring for adolescents. Accordingly, the American Academy of Pediatrics (AAP) states that pediatricians should be able to help pregnant adolescents understand their options and act on their decision to continue or terminate a pregnancy.¹¹ This position is also supported by the Society for Adolescent Health and Medicine (SAHM), an organization dedicated to improving the health and well-being of adolescents.¹² However, no studies have yet evaluated adolescent medicine providers' knowledge of medication abortion, to determine whether such expectations are being met.

The purpose of this study is to assess if providers who care for adolescents have sufficient knowledge to counsel adolescents on medication abortion. Further, we wanted to determine whether completion of adolescent medicine fellowship training was associated with improved performance on knowledge questions, in accordance with subspecialty board requirements.

Methods

Survey development and administration

We developed a 48-item questionnaire to evaluate adolescent medicine providers' service provision, prescribing and counseling patterns, knowledge, prior training, and referral patterns around medication abortion. Questions were drawn from a previous study of adolescent medicine providers' attitudes about medication abortion¹³ and from a Kaiser Family Foundation study of women's health care providers' knowledge and behaviors regarding mifepristone.¹⁴ We included additional questions to gather information on respondents' provision of reproductive health services counseling, contraception, procedures performed, and referrals, as well as barriers and supports to medication abortion service provision. The survey was reviewed by experts in medication abortion provision and training for content validity and item construction, and was piloted prior to fielding for face validity and ease of completion with 27 healthcare providers who attended a workshop on medication abortion.

Specific questions relevant to this article explored providers' knowledge of medication abortion safety, efficacy, indications and patient selection, expected outcomes, and complications, as well as their self-perceived knowledge of the medication abortion regimen involving mifepristone, using a 4-point likert scale ranging from "not familiar at all" to "very familiar". We also inquired about respondents' provision of medication abortion counseling and services, including amount of time spent providing adolescent reproductive health services, pregnancy testing, options counseling, and referrals for abortion services, as well as the number of pregnant women seen on a monthly basis, and gathered basic demographic and training information.

We administered this questionnaire via SurveyMonkey to medical provider members of SAHM (DOs, MDs, and NPs) with available email addresses (97%) who practiced in the United States (n=917). We choose SAHM members because they are a self-identified group dedicated to the care of adolescents, work in a wide range of clinical settings, and have varied training backgrounds. The majority of SAHM members are physicians, and many of these providers are board certified in adolescent medicine. Survey requests and completion reminders were sent to partial- and non-respondents up to six times from February to April 2010. All respondents who began the survey were entered into a raffle for forty iPod shuffles.

Definitions and Measures

We evaluated knowledge of medication abortion with a series of five questions inquiring about safety, efficacy, indications and patient selection, expected outcomes, and complications. Points for correct answers were summed to create an overall knowledge score with a maximum of 23 points. Questions and rating scales evaluating medication abortion safety, efficacy, and respondent familiarity were taken directly from the aforementioned Kaiser study of medication abortion knowledge among women's health care providers.¹⁴ Only correct answers contributed points to the overall knowledge score, with any incorrect answers receiving 0 points. Each knowledge item contributed relatively equally to the overall score, with less weight placed on the knowledge of expected outcomes, and more weight placed on the knowledge that all serious complications are rare, as follows. A correct answer of *Very safe*¹⁵ to the safety question *To the best of your knowledge, in terms of morbidity and mortality, how safe is mifepristone when used under a medical provider's care for medication abortion?* was given 5 points. A correct answer of *Very effective* (95%)^{3,16,17} to the efficacy question *To the best of your knowledge, how effective is the mifepristone-misoprostol combination when used under a medical provider's*

care for medication abortion in early pregnancy? was given 5 points. A correct answer of 7–9 weeks¹⁸ to the indications question *To the best of your knowledge, what is the maximum gestational age in pregnancy you can safely perform a medication abortion with mifepristone based on current FDA and evidence-based guidelines?* was given 5 points. Each correct answer of *Common (21–90%)*¹⁸ to the expected outcomes of abdominal pain, nausea, and vaginal bleeding was given 1 point. Each correct answer of *Rare (<5%)*¹⁹ to the complications of continuing pregnancy, hemorrhage, infection/endometritis, need for surgical completion, and retained products of conception was given 1 point.

Data analysis

We compared the professional titles of SAHM members who responded to the survey with those who did not as a potential source of response bias. We then looked at respondent demographics for those who completed all knowledge questions compared to those with missing information for one or more questions. All remaining analyses included only those respondents who answered all knowledge-related questions. We explored responses to questions on safety, efficacy, indications and patient selection, expected outcomes, and complications for the overall sample comparing those who did and did not complete adolescent medicine fellowship training. We then examined cumulative knowledge score and self-assessed medication abortion knowledge by completion of adolescent medicine fellowship training, and looked the relationship between the two constructs using ANOVA. Lastly, we compared responses to specific knowledge questions on the basis of respondents' provision of medication abortion counseling. All analyses, except where noted, were done using chi-squared testing.

Sensitivity analyses were performed using chi-square analyses to evaluate whether adolescent medicine subspecialists' performance on knowledge questions and their self-assessed knowledge differed on the basis of their potential exposure to formal education on medication abortion during fellowship training. Plausible exposure to formal education was defined as having completed residency in 1997 or later, to ensure that respondents had not completed their fellowship training prior to FDA approval of mifepristone in 2000.

All data analyses were done with STATA 11.0. The University of Rochester Research Subjects Review Board approved this study.

Results

Of the 917 U.S. clinician members of SAHM with email addresses, 87% (n=797) received the survey invitation. There were 430 survey participants, resulting in a response rate of 54%. Respondents and non-respondents did not differ on the basis of professional title (MD, DO, NP). Clinicians who answered the survey reported spending at least 40% of their time providing reproductive health services to teens; 96% of respondents offered pregnancy testing, 89% offered options counseling, and 78% referred for abortion services. Providers saw an average of 3.3 pregnant women (teens or adults) each month (range 0–60).

Our study sample included clinicians who completed all knowledge-related questions (n=365). The majority of respondents were between 24–59 years old. Most providers were white, non-Hispanic, and received their primary medical training in pediatrics. More than three-quarters of the sample completed fellowship training in adolescent medicine, and most worked in an urban setting. The majority of respondents trained resident physicians. Approximately half of clinicians offered medication abortion counseling, and three percent provided medication abortion services. More than one-quarter of providers counseled on surgical abortion only, while fifteen percent did not provide any type of abortion counseling (Table 1). Respondents who did and did not complete all knowledge-related questions were

comparable on most demographic variables (Table 1), except for age; younger providers were more likely to complete knowledge questions.

Almost a quarter of respondents incorrectly believed that medication abortion is less than very safe, while almost forty percent misidentified it as less than 95% effective, and more than a third did not select the correct maximum recommended gestational age (7–9 weeks) (Table 2). Providers also had challenges identifying expected outcomes of medication abortion. They were generally more aware that abdominal pain and vaginal bleeding are common outcomes after taking medication to induce an abortion, compared to nausea. However, correctly identifying that the (serious) complications of medication abortion are rare (<5%) was more challenging, with more than one-third of the sample overestimating the likelihood of each complication (continuing pregnancy, hemorrhage, infection or endometritis, need for surgical completion, or retained products of conception). There were no significant differences in specific knowledge areas by fellowship completion.

Less than a third of respondents had very good knowledge as defined by a cumulative knowledge score >19, while a fifth had poor knowledge of medication abortion (score <11) (Table 3). Although half of providers felt “somewhat familiar” with medication abortion, more than a quarter reported being “not too familiar”, and 8% reported being “not familiar at all”; only 12% of respondents felt that they were “very familiar” with the mifepristone regimen. Neither actual nor self-assessed knowledge varied by adolescent medicine fellowship training (Table 3), or among adolescent medicine fellowship graduates by year of training completion (as an indicator for potential exposure to education on the topic during fellowship).

Although providers’ perceptions of their knowledge were associated with performance on knowledge questions ($p<0.001$), they were a poor predictor of their total score ($r^2=0.08$). Clinicians who counseled patients on medication abortion had significantly higher knowledge levels in all areas assessed, other than expected outcomes (Figure 1).

Discussion

Adolescents are at high risk of unintended pregnancy, and it is therefore critical that clinicians accurately counsel teens on all of their pregnancy resolution options, including medication abortion. Although the vast majority of our respondents conduct pregnancy testing and offering options counseling, a third of providers underestimated the safety of medication abortion and almost half misjudged its effectiveness; more than half had incorrect knowledge about expected outcomes effects and complications. Furthermore, adolescent medicine fellowship training was not related to medication abortion knowledge in our sample, despite its expectations for board certification. Only about half of the SAHM members surveyed regularly discussed medication abortion with their pregnant patients, and even these providers had challenges estimating its efficacy and identifying appropriate patients by gestational age. Our findings indicate that gaps in medication abortion knowledge are pervasive among adolescent medicine providers, and suggest the need for improved education on this topic.

The lack of differences in medication abortion knowledge between providers who have and have not completed adolescent medicine fellowship is surprising, as the American Board of Pediatrics calls for this knowledge as part of fellowship training. Specific content specifications for subspecialty certification and re-certification in adolescent medicine include formulating a management plan for an adolescent requesting an abortion, understanding techniques for abortion at different stages of gestation, and understanding complications of abortion at different stages of gestation.¹⁰ Even recent fellowship graduates

were not more knowledgeable about medication abortion or confident in their knowledge than earlier cohorts, despite more opportunity for formal training on the topic since mifepristone's FDA approval. Our findings suggest that these topics may not be adequately covered during fellowship or continuing education.

The provision of medication abortion services was the only factor reliably associated with accurate information and counseling. However, less than four percent of adolescent medicine clinicians surveyed currently provide medication abortion – a number that has not significantly changed in over a decade despite the fact that, in 1998, 42% of SAHM members said they would prescribe medication to induce an abortion if mifepristone received FDA approval.¹³ Further evaluation of the educational opportunities, supports, and barriers to service provision and counseling would be helpful in better understanding this trend.

Another important finding of this study is the inability of providers to accurately assess their knowledge around medication abortion—a finding consistent with prior research on the accuracy of physician self-assessment.²⁰ We suspect that a few widely publicized cases of fatal toxic shock after medication abortion have generalized the belief that the risk of serious infection poses a greater risk to patient safety than the data suggests.^{21,22} Such misinformation may lead clinicians to deter teens from this method of pregnancy termination, or not even include it as a potential option during counseling. The fact that few women choose to terminate using medication abortion,⁵ despite high levels of patient-reported satisfaction,^{23,24} supports this idea.

Prior assessments of medication abortion knowledge have generally surveyed two groups of providers: obstetrician-gynecologists and general adult practitioners (internists and family medicine clinicians). The 2000 Kaiser study found that 47% of clinicians believed that medication abortion was very safe and 69% believed it was very effective.¹⁴ A later study of California resident physicians showed somewhat improved medication abortion knowledge; 64% of residents believed medication abortion was very safe and 75% believed it was very effective.²⁵ Our data are most comparable to findings from general practitioners, who receive similar training in abortion methods as the majority of primary care-trained (pediatrics or medicine) SAHM members. While adolescent medicine providers in our study were more aware of medication abortion safety, they were somewhat less knowledgeable about its efficacy despite the additional time which medication abortion has been successfully utilized in the US.

Limitations

Our findings cannot be generalized to all providers caring for adolescents. We would have liked to evaluate the distribution of primary and specialty training in our study population to better understand the overall generalizability of our results, but were unable to do so due to limitations in available SAHM member list data. However, these clinicians likely represent the best available sample of providers caring for adolescents because they practice in a range of settings (academic, community, clinical) and come from a variety of training backgrounds. In addition, although younger providers were more likely to complete all knowledge questions, we do not expect that this significantly biased our results based upon our findings that recent adolescent medicine fellowship graduates were no more knowledgeable or confident than more previous cohorts about mifepristone. Additionally, our response rate is comparable to the near 60% rates of recent AAP Periodic Surveys,²⁶ and data suggest that response biases are minimal for surveys of pediatricians (the majority of SAHM members),²⁶ and physicians as a group,²⁷ due to similarities between providers in knowledge, training, and attitudes.

Another potential methodological challenge is the lack of validated scales in measuring medication abortion knowledge. For this survey, we used questions from a similar knowledge evaluation conducted by the Kaiser Foundation,¹⁴ that were pretested and revised prior to fielding. The Kaiser Foundation has conducted the most extensive evaluation of provider knowledge of medication abortion since FDA approval, and their survey was developed in conjunction with and endorsed by both the American College of Obstetricians and Gynecologists and the American Association of Family Practice. Nevertheless, the terms used to quantify safety (i.e.: very safe, somewhat or not at all safe) are relative, and may have been interpreted differently by respondents. And, as with all internet-based surveys, respondents may have accessed information online to answer questions; however, this would suggest that true knowledge levels are even lower than reported.

There is also concern of specific non-response bias around abortion beliefs, which may have resulted in providers being less likely to respond to this survey if they did not believe in abortion. While there is no way to determine this, prior evaluations of SAHM and AAP members have reported that four to seven percent do not believe that abortion should be an option for adolescents.^{4,13} We found similar trends in our data; almost ten percent of respondents did not believe in abortion and just over three percent of respondents believed that abortion is not okay under any circumstances. This suggests that response bias due to abortion beliefs may not be an issue in our survey, though any bias present could lead to an overestimation of provider knowledge, counseling, and service provision.

Conclusions

Adolescent medicine specialists are expected to offer appropriate and medically accurate information to teens seeking information about pregnancy options, including medication abortion. However, more than forty percent of SAHM providers surveyed underestimated the effectiveness of medication abortion and many had incorrect knowledge about expected outcomes and complications. Despite expectations for board certification, adolescent medicine fellowship training was not related to medication knowledge. Given that self-assessed knowledge was a poor predictor of accurate knowledge in our evaluation, there is a need to better educate all adolescent medicine providers on issues related to medication abortion counseling. This is especially important for adolescent medicine subspecialists who often serve high-risk adolescents and provide adolescent reproductive health training for resident physicians and other medical trainees.

Acknowledgments

We would like to thank Aleeza Wachs for her assistance with list management and survey respondent follow-up, and acknowledge Jonathan Klein, MD, MPH for his assistance of in the conceptual design of this project. This project was funded by a grant from the Society for Family Planning. Kevin Makino is a trainee in the Medical Scientist Training Program funded by NIH T32 GM07356, and was also supported in part by NIH Grant Number UL1 RR024160. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Society for Family Planning, National Institute of General Medical Sciences, or NIH.

Abbreviations

FDA	US Food and Drug Administration
AAP	American Academy of Pediatrics
SAHM	Society for Adolescent Health and Medicine

References

1. Kost, K.; Henshaw, S.; Carlin, L. [Accessed July 25, 2011] Teenage Pregnancies, Births and Abortions: National and State Trends and Trends by Race and Ethnicity. 2010. Available at: <http://www.guttmacher.org/pubs/USTPtrends.pdf>.
2. Finer L, Henshaw S. Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. *Perspect on Sex and Reprod Health*. 2006; 38(2):90–96.
3. Kahn JG, Becker BJ, MacIsaac L, et al. The efficacy of medical abortion: a meta-analysis. *Contraception*. 2000 Jan; 61(1):29–40. [PubMed: 10745067]
4. Fleming GV, O'Connor KG. Adolescent abortion: views of the membership of the American Academy of Pediatrics. *Pediatrics*. 1993 Mar; 91(3):561–565. [PubMed: 8441559]
5. Jones RK, Zolna MR, Henshaw SK, et al. Abortion in the United States: incidence and access to services, 2005. *Perspect Sex Reprod Health*. 2008 Mar; 40(1):6–16. [PubMed: 18318867]
6. Jones RK, Henshaw SK. Mifepristone for early medical abortion: experiences in France, Great Britain and Sweden. *Perspect Sex Reprod Health*. 2002 May-Jun; 34(3):154–161. [PubMed: 12137129]
7. Phelps RH, Schaff EA, Fielding SL. Mifepristone abortion in minors. *Contraception*. 2001 Dec; 64(6):339–343. [PubMed: 11834231]
8. Ho PC. Women's perceptions on medical abortion. *Contraception*. 2006 Jul; 74(1):11–15. [PubMed: 16781253]
9. Henshaw S. Unintended pregnancy in the United States. *Fam Plann Perspect*. 1998; 30(1):24–29. +46. [PubMed: 9494812]
10. Content outline. Adolescent Medicine. Subspecialty in-training, certification, and maintenance of certification examinations. The American Board of Pediatrics. 2011 Jul 25. Available at: <https://http://www.abp.org/abpwebsite/certinfo/subspec/suboutlines/adol2010.pdf>.
11. Counseling the adolescent about pregnancy options. American Academy of Pediatrics. Committee on Adolescence. *Pediatrics*. 1998 May; 101(5):938–940. [PubMed: 9565431]
12. Emans SJ, Brown RT, Davis A, et al. Society for Adolescent Medicine Position Paper on Reproductive Health Care for Adolescents. *J Adolesc Health*. 1991 Dec; 12(8):649–661. [PubMed: 1839215]
13. Miller N, Miller D, Pinkston Koenigs L. Attitudes of the physician membership of the society for adolescent medicine toward medical abortions for adolescents. *Pediatrics*. 1998 May. 101(5):E4. [PubMed: 9565437]
14. [Accessed July 25, 2011] Kaiser Family Foundation National Survey of Women's Health Care Providers and the Public: Views and Practices on Medical Abortion. 2001 Sep. Available at: <http://www.kff.org/womenshealth/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=13855>.
15. Henderson JT, Hwang AC, Harper CC, et al. Safety of mifepristone abortions in clinical use. *Contraception*. 2005 Sep; 72(3):175–178. [PubMed: 16102550]
16. Fjerstad M, Sivin I, Lichtenberg ES, et al. Effectiveness of medical abortion with mifepristone and buccal misoprostol through 59 gestational days. *Contraception*. 2009 Sep; 80(3):282–286. [PubMed: 19698822]
17. Schaff EA, Fielding SL, Westhoff C. Randomized trial of oral versus vaginal misoprostol at one day after mifepristone for early medical abortion. *Contraception*. 2001 Aug; 64(2):81–85. [PubMed: 11704083]
18. Schaff EA, Fielding SL, Eisinger SH, et al. Low-dose mifepristone followed by vaginal misoprostol at 48 hours for abortion up to 63 days. *Contraception*. 2000 Jan; 61(1):41–46. [PubMed: 10745068]
19. Schaff EA. Mifepristone: ten years later. *Contraception*. Jan; 81(1):1–7. [PubMed: 20004266]
20. Davis DA, Mazmanian PE, Fordis M, et al. Accuracy of physician self-assessment compared with observed measures of competence: a systematic review. *JAMA*. 2006 Sep 6; 296(9):1094–1102. [PubMed: 16954489]
21. Cohen AL, Bhatnagar J, Reagan S, et al. Toxic shock associated with *Clostridium sordellii* and *Clostridium perfringens* after medical and spontaneous abortion. *Obstet Gynecol*. 2007 Nov; 110(5):1027–1033. [PubMed: 17978116]

22. Weston PV. Abortion and clostridial toxic shock syndrome. *Obstet Gynecol.* 2008 Mar;111(3):778. [PubMed: 18310387]
23. Shochet T, Trussell J. Determinants of demand: method selection and provider preference among US women seeking abortion services. *Contraception.* 2008 Jun; 77(6):397–404. [PubMed: 18477487]
24. Shannon CS, Winikoff B, Hausknecht R, et al. Multicenter trial of a simplified mifepristone medical abortion regimen. *Obstet Gynecol.* 2005 Feb; 105(2):345–351. [PubMed: 15684163]
25. Schwarz EB, Luetkemeyer A, Foster DG, et al. Willing and able? Provision of medication for abortion by future internists. *Womens Health Issues.* 2005 Jan-Feb;15(1):39–44. [PubMed: 15661586]
26. Cull WL, O'Connor KG, Sharp S, et al. Response rates and response bias for 50 surveys of pediatricians. *Health Serv Res.* 2005 Feb; 40(1):213–226. [PubMed: 15663710]
27. Kellerman SE, Herold J. Physician response to surveys. A review of the literature. *Am J Prev Med.* 2001 Jan; 20(1):61–67. [PubMed: 11137777]

Figure 1.
Medication abortion knowledge areas by medication abortion counseling

Table 1

Respondent demographics for overall and knowledge samples

Demographics	All respondents (n=430)	Knowledge respondents (n=365)	p-value
	n (%)	n (%)	
Age (years)			0.041
24–39	118 (28.3)	110 (30.8)	
40–49	109 (26.1)	92 (25.8)	
50–59	133 (31.9)	108 (30.3)	
60 or older	57 (13.7)	47 (13.2)	
Female	286 (68.8)	243 (68.3)	0.598
Race			0.315
White	330 (79.1)	278 (77.9)	
Black	37 (8.9)	34 (9.5)	
Asian	27 (6.5)	24 (6.7)	
Other	13 (3.1)	11 (3.1)	
Hispanic ethnicity	20 (4.8)	16 (4.5)	0.470
Primary training			0.463
Pediatrics	298 (72.7)	250 (71.4)	
Internal medicine (IM)	21 (5.1)	19 (5.4)	
Combined IM & pediatrics	23 (5.6)	20 (5.7)	
Family medicine	36 (8.8)	34 (9.7)	
OB-Gyn	8 (2.0)	8 (2.3)	
Nurse practitioner	21 (5.1)	16 (4.6)	
Adolescent medicine fellowship	256 (77.3)	223 (77.4)	0.920
Practice location			0.823
Urban	313 (75.1)	268 (74.9)	
Suburban	83 (19.9)	71 (19.8)	
Rural	21 (5.0)	19 (5.3)	
Resident education	356 (79.8)	282 (80.3)	0.598
Abortion counseling and provision			0.204
Provide medication abortion	14 (3.3)	13 (3.6)	
Counsel medication	226 (53.1)	200 (54.8)	
Counsel surgical only	120 (28.2)	99 (27.1)	
No counseling	66 (15.5)	53 (14.5)	

* Note: Respondents were not required to answer every demographic question

Table 2

Medication abortion knowledge areas by adolescent medicine fellowship completion

Knowledge Questions	Knowledge Sample (n=288)	Adolescent fellowship completion (n=223)	No fellowship completion (n=65)	p-value
	n (%)	n (%)	n (%)	
Safety				0.577
Not too safe or not at all safe	5 (1.7)	3 (1.4)	2 (3.1)	
Somewhat safe	57 (19.8)	43 (19.3)	14 (21.5)	
Very safe	226 (78.5)	177 (79.4)	49 (75.4)	
Efficacy				
<80%	9 (3.1)	6 (2.7)	3 (4.6)	0.728
80–94%	97 (33.7)	75 (33.6)	22 (33.9)	
95%	182 (63.2)	142 (63.7)	40 (61.5)	
Indications				0.915
< 120 hours (5 days)	11 (3.8)	8 (3.6)	3 (4.6)	
7–9 weeks	203 (70.5)	157 (70.4)	46 (70.8)	
> 9 weeks	74 (25.7)	58 (26.0)	16 (24.6)	
Expected outcomes correct (incidence 21–90%)				
Abdominal pain	252 (87.5)	194 (87.0)	58 (89.2)	0.632
Nausea	185 (64.2)	139 (62.3)	46 (70.8)	0.212
Vaginal bleeding	239 (83.0)	182 (81.6)	57 (87.7)	0.251
Complications correct (incidence <5%)				
Continuing pregnancy	174 (60.4)	138 (61.9)	36 (55.4)	0.346
Hemorrhage	135 (46.9)	106 (47.5)	29 (44.6)	0.678
Infection	186 (64.6)	141 (63.2)	45 (69.2)	0.373
Need for surgical completion	165 (57.3)	130 (58.3)	35 (53.9)	0.523
Retained products of conception	154 (53.5)	121 (54.3)	33 (50.8)	0.620

* Note: Correct responses shaded in grey

Table 3

Medication abortion actual and self-assessed knowledge by adolescent medicine fellowship completion

Knowledge Questions	Knowledge Sample (n=288)	Adolescent fellowship completion (n=223)	No fellowship completion (n=65)	p-value
	n (%)	n (%)	n (%)	
Overall knowledge score				0.424
Very good (20–23)	91 (31.6)	69 (30.9)	22 (33.9)	
Good (16–19)	71 (24.7)	60 (26.9)	11 (16.9)	
Satisfactory (11–15)	73 (25.4)	55 (24.7)	18 (27.7)	
Poor (0–14)	53 (18.4)	39 (17.5)	14 (21.5)	
Self-assessed knowledge				0.716
Very familiar	35 (12.2)	25 (11.2)	10 (15.6)	
Somewhat familiar	158 (55.1)	125 (56.1)	33 (51.6)	
Not too familiar	76 (26.5)	60 (26.9)	16 (25.0)	
None	18 (6.3)	13 (5.8)	5 (7.8)	