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When Pregnant Patients Disclose Substance Use: Missed Opportunities for Behavioral Change Counseling

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Abstract

Objective—The first obstetric visit is an opportunity to provide counseling to women with substance abuse risks, including smoking, drug use, and alcohol use. Little is known about how obstetric care providers and patients discuss these issues. Our objective was to examine patient-provider communication about substance use behaviors during these visits.

Methods—We audiotaped and transcribed verbatim first prenatal visits in an outpatient hospital clinic, then qualitatively analyzed them for content and process of communication using modified grounded theory methods.

Results—Twenty-nine providers (21 residents, 5 midwives, 3 nurse practitioners) and 51 patients participated. Twenty-five patients were smokers, 4 used alcohol, and 11 used drugs. Provider responses to smoking disclosures included discussions of risks, encouragement to quit-cut down,

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affirmation of attempts to quit-cut down, and referral to smoking cessation programs. Responses to alcohol or drug disclosures included only a general statement regarding risks and referral to genetics.

Conclusion—Providers were less attentive to alcohol and drugs than smoking where they had pre-established patterns of response.

Practice Implications—Providers should discuss behavioral change strategies and motivations with pregnant patients who use drugs and/or alcohol as well as those who smoke.

Keywords

Prenatal care; Obstetrics; Substance-use; Practitioner-patient interaction; Risk communication; Qualitative research

1. Introduction

The use of tobacco, alcohol, and illicit drugs during pregnancy is a significant problem in the United States (U.S.). Approximately 21% of women in the reproductive ages of 18 to 44 smoke; [1] another 12 to 29% continue to smoke during pregnancy.[2–4] Studies estimate that between 10–22% of such women report drinking some alcohol during pregnancy; another 2–3.5% describe heavy or frequent alcohol use.[5,6] Several nationwide surveys of pregnant women found that 2.8–7% admitted using illicit drugs during pregnancy.[5,7–9] Another study by the U.S. General Accounting Office estimated that 100,000 to 375,000 women each year use some illicit drug while pregnant.[10] The use of substances such as tobacco, alcohol, and illicit drugs during pregnancy has been associated with significant health risks and poor outcomes for both the mother and fetus.

The 2001 Surgeon General's Report on Women and Smoking details adverse outcomes associated with tobacco use including: increased risks of ectopic pregnancy, spontaneous abortion, preterm premature rupture of membranes, placental abruption, placenta previa, preterm delivery, stillbirth, and low birth weight.[11] Infants born to pregnant smokers have increased risks for neonatal mortality and sudden infant death syndrome (SIDS).[11]

Fetal alcohol syndrome, one of the most severe effects of alcohol use during pregnancy, remains the leading cause of preventable mental retardation in the U.S.[12,13] Use of alcohol during pregnancy is also associated with other adverse effects for exposed children such as poor coordination, hyperactive behavior, learning and developmental problems, and behavioral problems.[12,14,15]

Illicit drug use during pregnancy is associated with spontaneous abortion, low birth weight, preterm delivery, abruptio placentae, congenital abnormalities, fetal demise, hypertensive episodes, and thromboembolic events.[16–23] Newborn infants are at higher risk of drug withdrawal at birth, admissions to neonatal intensive care units, longer hospital stays, and neonatal death.[16] Children with prenatal drug exposure can have developmental, learning, and behavioral problems.[24,25]

Being pregnant can inspire women to stop using tobacco, alcohol, and illicit drugs. Studies suggest that many patients experience additional motivation during pregnancy to consider and initiate certain positive health behavioral changes.[26–29] The first obstetric visit is often regarded as an opportunity for medical providers to counsel or intervene on a number of behavioral health issues. The American College of Obstetricians and Gynecologists (ACOG) recommends that obstetric care providers assess for substance use during pregnancy, counsel patients who disclose substance use on its potential consequences, and refer to appropriate

support services. Despite these ACOG guidelines, little is known regarding the content or process of these discussions.

Studies suggest that these conversations are indeed occurring. In the past, clinician attitudes toward patients who use substances, particularly alcohol and/or illicit drugs, were largely negative and pessimistic and few routinely screened their patients about substance use.[30–35] More recent studies indicate that the majority of obstetric care providers now recognize the importance of this issue and ask their pregnant patients about tobacco, alcohol and illicit drug use.[36–40] Nonetheless, there remains some variation in provider training and counseling practices for patients that disclose substance use. For example, one study surveying practicing obstetricians/gynecologists in the state of Ohio reported 66% advised smoking cessation to their pregnant patients who used tobacco.[40] In contrast, a survey of North Carolina obstetrics care providers which included obstetricians, family medicine physicians, nurse midwives, nurse practitioners and physician assistants noted that 100% reported advising their pregnant smokers to quit. However, 48% of these study participants described having received no formal training in smoking cessation counseling.[38] Another study among certified nurse midwives in the state of New Jersey reported that while 99% advised smoking cessation to their pregnant smokers and 95% explained the dangers of smoking, only 41% reported having had smoking cessation training and 80% expressed a need for additional training.[39] For alcohol and drug use, between 80 to 95% of obstetric care providers advised abstinence pregnant patients who reported use.[36,37] However, little is known regarding the actual communication regarding content, approach and style; all of these studies were based on self-report data reported in written questionnaires. At present, there is no existing direct observational data regarding how obstetric care providers ask and counsel patients about tobacco, alcohol and illicit drug use during pregnancy. Better understanding how health providers and patients discuss health risks like substance use during pregnancy is a necessary first step to identifying effective communication on this topic. To address this gap, we designed a study to examine patient-provider communication about substance use behaviors during first obstetric visits.

2. Methods

The current analysis was part of a larger study of screening and discussion of behavioral health issues during the first obstetric visit. Here, we analyzed discussions between providers and pregnant patients who reported using substances. The project was approved by The University of Pittsburgh Institutional Review Board (IRB). All participants provided written informed consent for audio taping, transcription and analysis of their visits.

2.1 Settings and Participants

This study took place in a hospital-based obstetrics and gynecology clinic in an urban academic medical center in Pittsburgh, Pennsylvania serving mainly young, lower income women, 55% of whom are African-American. English-speaking pregnant women presenting for their first obstetric visit in this clinic were eligible to participate in the study if their obstetric care provider had consented to study participation as well. Provider participants included obstetrics and gynecology resident physicians, nurse practitioners, and nurse midwives who provided first obstetric visits to patients in this clinic. We collected socio-demographic and information—including age, parity, race/ethnicity, and marital status—from the patients prior to audio taping the clinic visit. From provider participants, we collected information on gender, race, training level for resident physician participants and years of practice for nurse midwives and nurse practitioners.

2.2. Data analysis

Two investigators (JC and DD) reviewed all transcripts and audiotapes to identify visits during which the patient participants disclosed use of a substance such as tobacco, alcohol, and/or illicit drugs. Using an analytic techniques derived from grounded theory, the investigators separately coded each of the transcripts for content and then met to reconcile coding.[41] From the coded segments we identified patterns of communication related to substance use.

The individual obstetric care provider was the unit of analysis. We clustered our analyses of transcripts from the same provider to establish whether that provider had a pattern of communication. Similar patterns for a provider were considered as a single unit of analysis to minimize the impact of a provider who might have seen more substance-using patients. For this analysis, only three providers had visits with more than one patient participant.

The list of codes was further developed through an iterative process, and a final coding scheme was developed from the list. After applying the final coding scheme to all transcripts, we summarized our analyses of clinic visit discussions to identify (1) common content (i.e. what was said) and (2) variations in processes (i.e., the means by which providers obtain required information and discuss management options with patients). We used the ATLAS.ti 5.2.9 qualitative data analysis software to assist in the documenting, recording, organizing, and summarizing our final codes and resulting themes.[42,43]

3. Results

3.1. Patient and Provider Participants

A total of 29 obstetric care providers and 51 patients participated in the larger study. Subject recruitment and data collection for this study occurred between May 2005 and May 2006. Characteristics for both provider and patient participants are given in Table 1. There were 21 obstetrics and gynecology resident physicians, 5 nurse midwives and 3 nurse practitioners. All training levels of the obstetrics and gynecology residency were represented. All obstetric care providers in our study were female. Patients were predominately single and had given birth to other babies prior to this pregnancy. Patients' mean age ranged from 18–36 years (mean= 24 years); 59% were African-American. While we did not collect information on each patient participant's gestational age at the time of their audio-taped visit, existing hospital data notes that between 95–97% of the pregnant patients from the clinical study site present for their first prenatal visit before their 13th week. Visit length was 13 to 54 minutes (one audiotape stopped recording before the end of the visit due to battery failure). Twenty-seven of the total 51 (53%) audio-taped discussions included a patient disclosure of at least one type of substance use (i.e. tobacco, alcohol, and/or illicit drugs). Twelve obstetric care providers conducted these 27 visits. Characteristics of the participants in this sub-study analysis are provided in Table 2. Most obstetric care providers saw only one or two patients of the 27 patients. One provider saw 13 of these 27 patients; two other providers saw two patients each.

3.2. Themes

3.2.1 Screening and disclosures—The topics of smoking, alcohol use and illicit drug use were discussed in all 51 visits. Half (25/51) of the patients disclosed tobacco use; almost all of the patients (25/27) in the analyzed conversations were smokers. Five patients also disclosed alcohol use, and 10 reported illicit drug use. Of the two non-smokers in the analyzed conversations, one reported only alcohol use and the other reported only marijuana use. The types of drugs patients reported using ranged from marijuana to polysubstance use, including heroin. Of the 5 women who disclosed alcohol use during pregnancy, 4 also reported illicit drug use.

3.2.2 Screening for smoking elicited disclosures—In 48 of the 51 visits, the provider asked a screening question regarding smoking; in 2 visits patients self-disclosed smoking. Another patient disclosed smoking on the written pre-visit questionnaire which was confirmed during the visit. Six patients described quitting smoking 3 days to 3 months prior to their first obstetric visit. However, most reported having quit 1–2 weeks after a positive pregnancy test. Of those who continued to smoke, 12 described a desire to quit or cut down and 9 described having already cut down since discovering they were pregnant.

3.2.3 Providers responded to smoking disclosures with advice, support and resources—All provider responses to disclosure of continued smoking during pregnancy included an assessment of the amount of smoking; 11 of 12 providers advised their patients to quit or cut down smoking. Providers often used supportive statements in response to patient attempts to cut down; provided referrals to smoking cessation programs, and occasionally empathically acknowledged the difficulty of quitting smoking. The following excerpt between a second-year obstetrics and gynecology resident and her patient is illustrative:

Provider: Do you smoke cigarettes?

Patient: Yeah.

Provider: How much do you smoke?

Patient: Now I'm at like four or five cigarettes a day.

Provider: Have you been cutting down?

Patient: Yeah. I cut down majorly.

Provider: Good. I would certainly encourage you to cut down. We have something called the STOP program—

Patient: Right.

Provider: --that helps pregnant women stop smoking. Because it's not easy. If you would like to, I could refer you to that.

Patient: Okay.

Provider: Um, lots of women find that it's very helpful.

Some providers expanded to include information on the effects of smoking during pregnancy. These efforts tended to be brief such as this statement from a nurse practitioner, "You know you're at risk for a smaller baby." Only one provider in our study, a nurse midwife, described more extensive effects: "...Any amount of smoking that you can cut down is helpful, um, and improves the baby's birth weight. And if you can quit by the time the baby comes out would be best because we know babies whose moms smoke have increased risks of asthma and SIDS."

3.2.4 Women often self-disclosed alcohol and/or illicit drug use—Of the 5 women who acknowledged alcohol use during their clinical visit, 3 self-disclosed; 4 also disclosed illicit drug use. Of the 10 women who disclosed illicit drug use, 7 self-disclosed. The illicit drugs the women admitted to using included marijuana, cocaine, heroin, methadone/suboxone, and sedatives.

3.2.5 Provider responses to alcohol or drug use disclosures focused more on information gathering than behavior-change counseling—When patients disclosed alcohol or drug use during their visit, providers generally sought to assess the amount and/or timing of last use and whether it occurred while the patient was already pregnant. All patients stated that they were currently abstinent especially since discovering they were pregnant. Abstinence ranged from 4 days to two years (for a woman who was on methadone replacement for heroin addiction reported being clean for two years). One provider, a first-year obstetrics and gynecology resident, made an explicit statement about further drug use (e.g. “I would certainly encourage you to continue to quit [marijuana use.]”), and 4 providers (3 nurse midwives and one nurse practitioner) made affirming statements regarding patients’ intent to abstain from further use such as “Oh, congratulations” and “I think you are so on the right track with what you are doing for yourself.”

Of the women who disclosed alcohol and/or drug use 3 expressed concern for potential harm to the baby. In discussions with women who disclosed alcohol use, 2 providers mentioned potential risks for fetal development, but in a very general, nonspecific manner. For example, one provider, a fourth-year obstetrics-gynecology resident, stated that alcohol use “can have really long-term implications on the development of the fetus.” Another, a first-year resident, mentioned, “We find that alcohol is very bad for babies.”

Detailed responses to patient disclosures of illicit drug use occurred in a single visit in which a patient expressed concern the harm her cocaine use may have caused the baby. The provider in this visit, a fourth-year obstetrics-gynecology resident, first described potential effects of cocaine, focusing primarily on the drug’s association with placental abruption and growth restriction and followed up with words of reassurance, “While all of those are very bad, the overwhelming likelihood is that early first trimester exposure will hopefully have no long-term effects” and describes her intention to refer the patient to the genetics department for further discussion of the risks.

3.2.6 Use of referrals in providers’ response to alcohol or drug use disclosures—For women who acknowledged drug or alcohol use, almost half (4/10, 40%) the discussions included a referral to genetics for further counseling and reassurance that the fetus has not been harmed. Each was with a different provider including a first-year resident, a fourth-year resident, a nurse-midwife and a nurse practitioner; in 3 cases the referrals immediately followed patients’ expressions of concern about illicit drug use. The following dialogue is an example of how the obstetric care providers explain this referral:

Provider: Have you had any alcohol since you got pregnant?

Patient: Yeah.

Provider: You have. Okay. How much do you think you’ve been drinking?

Patient: Um, right before I found out, I was kind of really drinking a lot.

Provider: Okay. So you were like getting drunk.

Patient: Every night almost because I work [in a bar] every night.

Provider: Okay. Okay. Um, how much have you been drinking recently?

Patient: Mm, I haven’t drank nothing since I found out.

Provider: Okay. Um, we do find that alcohol is very bad for babies. Um, and if you would like, we can refer you to Genetics, um, so that they can kind of take a look at you, take a look at the baby, and talk about some of the possible consequences.

Provider: Okay.

Two providers, both midwives, made referrals to social work—one primarily because the patient was acutely depressed. Aside from these two social work referrals, there were no discussions about support services, such as behavioral health or addiction medicine involvement to assist the patient with her drug use. Only one discussion with a midwife contained an assessment of the patient's intention, ability, and confidence in avoiding further alcohol or drug use.

4. Discussion and Conclusion

4.1. Discussion

Our analysis of taped discussions revealed that obstetric care providers generally questioned their pregnant patients regarding use of tobacco, alcohol and illicit drugs and did so more thoroughly when patients disclosed use of these substances. Discussions about tobacco and smoking included information, advice, support and referrals, whereas discussions regarding alcohol and/or drug use were limited to assessing details of last use and referral to the genetics department. While most discussions of smoking included information about fetal health risks, most discussions about illicit drug use did not. Neither type of discussion contained any direct exploration of the patient's motivations, readiness, or barriers to change. Additionally, there were few discussions of strategies to initiate and/or maintain behavior change for women using substances during pregnancy.

That most of our provider participants provided some form of smoking cessation counseling is reassuring. In the past, many surveys of physicians had reported low rates of smoking counseling. The National Ambulatory Medical Care Survey (NAMCS) reported that 81% of physicians caring for pregnant patients identified their smoking status but offered smoking cessation counseling in only 23% of the time.[30] Our results are more consistent with recent reports that the majority of obstetric providers are screening for tobacco use and providing some smoking cessation counseling.[44–46] Our study confirms this behavior through direct observation rather than self-report.

It is likely that provider comfort with smoking cessation counseling has improved since the 1991–1996 NAMCS study. Surveys indicate that more medical schools are including more hours of smoking cessation training throughout the curriculum.[47–49] Additionally, ACOG provides its members with multiple resources to assist in counseling patients who smoke.[50] For pre-natal care ACOG offers the 5 A's: Ask, Advise, Assess, Assist and Arrange.[51] Our study providers generally included 4 of the 5 A's in their discussions but were less likely to Assess patients' confidence, abilities and potential challenges in quitting smoking.

Provider counseling for alcohol and illicit drug use during pregnancy was more limited. While usually inquiring about alcohol and illicit drug use, they did not directly advise patients to quit. Since many patients said they had “quit” or has used “nothing” since confirming their pregnancy, providers may have assumed counseling was unnecessary. Such an assumption is flawed because these substances are associated with addiction and physical and/or psychological dependence. We note that only one of the providers inquired about the patient's confidence in and barriers to avoiding further illicit drug use. In contrast, many of the patients who disclosed alcohol or drug use did so spontaneously without requiring/waiting for the provider to specifically ask. This suggests that the patients were motivated and/or comfortable

with sharing this information. This finding parallels existing literature indicating that many pregnant women using alcohol and illicit drugs are highly motivated to stop using. For example, Ebrahim and Gfroerer's analysis of data from the National Household Survey on Drug Abuse indicated that as pregnancies progressed, more women abstained from illicit drug use with up to 93% reporting no drug use during the third trimester.[8] When three patient participants in our study expressed concern about potential harm to the fetus due to their drug use, their providers did not take the opportunity to provide specific information regarding potential associated harms or discuss strategies for avoiding further use. This finding suggests that providers may be uncomfortable or reluctant to discuss these issues, perhaps assuming that discussing the potential risks of these substances would either threaten rapport or generate distress or anxiety in their patients. In one discussion that did include more details regarding the negative effects of cocaine on a pregnancy, the provider felt compelled to provide the patient with reassurance by minimizing the possibility of harm.

Alcohol and illicit drug use in pregnancy may generate unique complexities and challenges as such as the tension between advocating for the woman versus advocating for the fetus, worries about stigma and judgment, concerns about consequences of disclosure/discovery of substance use such as imprisonment, prosecution, or losing custody of the child/ren.[52–55] Additionally, providers may be struggling with their own conflicting feelings toward patients who disclose alcohol and/or illicit drug use. The American College of Obstetricians and Gynecologists (ACOG) and the American College of Nurse-Midwives have issued statements opposing state legislation that involve punishing pregnant women who use substances.[56,57] At the same time, a survey of practicing physicians found that most obstetricians supported compulsory substance abuse treatment programs and 45% favored statutes that defined substance use during pregnancy as “child abuse” that could result in removing that child from maternal custody. [58]

The observation that providers offered referrals to the genetics department raises some curiosity. One potential explanation for this behavior is that providers may be avoiding what they perceived as difficult and lengthy conversations by shifting this responsibility to other clinical providers. In our institution genetic counselors do not provide behavioral change counseling, they simply give information regarding potential teratogens. In this regard, providers may be delegating the sobering and uncomfortable discussion of the risks and negative effects of alcohol/drug use to those perceived as more expert on the topic. Another possible explanation is that providers may perceive that patients are distressed and worried about alcohol and/or drug exposure to the fetus. Referral in this circumstance may be a method of offering reassurance. Indeed, 3 of 4 referrals occurred immediately after the patient explicitly described her worry that she had “hurt the baby.” Unfortunately, no genetics evaluation would determine potential detrimental effects on the fetus—particularly as many are associated with neurological, cognitive and behavioral development of the child.[59–61]

This study has several limitations. First, the small sample size (12 providers and 26 patients) limits the generalizability of our findings. Generalizability is further limited by non-probability sampling, use of a single clinic site, and lack of male obstetric care provider participation. The size of our study also limited comparison of communication styles between provider types or based on other provider characteristics. We are currently conducting a larger study that will allow us to explore potential differences in communication patterns. Additionally, it is possible that more detailed or focused discussions regarding behavioral risks may have occurred with other clinic staff (e.g., nurses, social work) but these were not captured. One strength of this study is the use of direct observation rather than surveys or self-report to analyze conversations between obstetrics providers and pregnant patients.

4.2. Conclusion

The obstetric care providers in our study routinely provided assessment and counseling to pregnant patients who smoked. By contrast, counseling for alcohol and illicit drug use was limited focused primarily on referral which may be a proxy for avoiding difficult and time consuming conversations. Providers were less attentive to the dangers of alcohol and drugs than they were smoking where they had pre-established patterns of response.

4.3 Practice Implications

The findings from this study suggest that while obstetric care providers may be adequately addressing tobacco use with pregnant patients who smoke, counseling regarding alcohol and illicit drug use needs to be expanded to include discussions of motivational and behavioral change strategies. Additional provider training is needed in better understanding substance use and addiction as well as improvements in communication skills. For the clinical site used in our study, we intend to design an educational intervention to review the adverse consequences of drug and alcohol use in pregnancy, provide understanding regarding the challenges and process of behavior change, explore motivational strategies for dealing with alcohol and/or drug use, inform our clinicians of local resources and referral options, and create a communication workshop to practice communication skills on this topic.

The addiction medicine and counseling fields have developed and explored various methods that may be useful when counseling pregnant patients who use these substances to change their behaviors. One method, motivational interviewing, is a patient-centered counseling style directed toward enhancing motivation to change a behavior by having the patient clarify and resolve ambivalence.[62] Various brief motivational interventions modeled after this style have been successful in primary care settings[63,64] but have had mixed results in pregnancy.[65–69] ACOG has also offered additional support for its members in addressing alcohol use with pregnant patients through the release of the Drinking and Reproductive Health: A Fetal Alcohol Spectrum Disorders Tool Kit [70] and a slide lecture presentation addressing the identification and treatment of drug use.[71]

Lack of time is most likely a central barrier to integrating more motivational behavioral change strategies during the first obstetric visit. Other studies have suggested that health care professionals perceive caring for patients with problematic alcohol and/or drug use will consume much of their time and limit their availability to other patients.[72] One method of addressing this barrier would be collaborations with specialized referral services. Obstetric care providers would benefit from improved access and communication with addiction medicine and behavioral health resources and expertise. In one survey of obstetricians, 63% indicated that they lacked information regarding any referral resources for their patients who used alcohol or illicit drugs.[36] Establishing relationships with local counseling centers that address potential addiction to alcohol and/or illicit drugs would be essential to ensuring that patients who use substances receive complete and appropriate care.

Another approach to addressing the lack of time barrier, and potentially the lack of resources, is to use the first obstetric visit as a time of assessment and introduction to a plan to continue the discussion on substance use throughout subsequent visits. This notion of “chipping away at risk behaviors” was a strategy suggested by obstetric care participants in a focus group study conducted by Herzig and colleagues.[73] Rather than transforming the first obstetric visit into an extensive counseling session, these providers described a mindset of addressing behavioral risks such as substance use over several visits with repeated assessments, repeated brief interventions and constant support.

Our study suggests that better understanding of the various beliefs, concerns and perceptions held by both obstetric care providers and pregnant patients will be helpful in addressing these issues. Research on how obstetric care providers' feelings about substance use during pregnancy affect the direction and/or style of counseling as well as explorations of additional gaps in knowledge and skills will be helpful in designing successful provider training interventions. Likewise studies exploring how discussions about substance use with obstetric care providers affect pregnant women using substances such as tobacco, alcohol and drugs will be necessary. Understanding how these discussions affect patients' attitudes and feelings about their provider, their understanding of risks of alcohol and/or drugs on their health and the health of their fetus, and their intentions to decrease their risks will inform the development of future counseling interventions.

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We confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story.

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References

- Centers for Disease Control and Prevention. Tobacco Use Among Adults—United States, 2005. *MMWR* 2006 November 6;55:1145–1148. [PubMed: 17065979][serial online]
- Substance Abuse and Mental Health Services Administration. Results from the 2004 National Survey on Drug Use and Health: National Findings, Tobacco Use. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies; 2005.
- Kahn RS, Certain L, Whitaker RC. A reexamination of smoking before, during, and after pregnancy. *Am J Public Health* 2002;92:1801–1808. [PubMed: 12406812]
- Colman GJ, Joyce T. Trends in smoking before, during, and after pregnancy in ten states. *Am J Prev Med* 2003;24:29–35. [PubMed: 12554021]2003
- Greenfield SF, Manwani SG, Nargiso JE. Epidemiology of substance use disorders in women. *Obstet Gyn Clin N Am* 2003;30:412–446.
- Centers for Disease Control and Prevention. Alcohol use among women of childbearing age--United States, 1991–1999. *MMWR* 2002;51(14):273–276. [PubMed: 11952279][erratum appears in *MMWR - Morbidity & Mortality Weekly Report* 2002 Apr 12;51(14):308].
- Finch BK, Vega WA, Kolody B. Substance use during pregnancy in the state of California, USA. *Soc Sci Med* 2001;52:571–583. [PubMed: 11206654]
- Ebrahim SH, Gfroerer J. Pregnancy-related substance use in the United States during 1996–1998. *Obstet Gynecol* 2003;101:374–379. [PubMed: 12576263]
- Substance Abuse and Mental Health Services Administration. Results from the 2005 National Survey on Drug Use and Health: National Findings. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2006. Report No.: DHHS Publication No. SMA 06-4194.
- US General Accounting Office. Drug exposed infants: A generation at risk. Washington DC: US General Accounting Office; 1990. Report No.: Publication No.: HRD-90-138.

11. United States Department of Health and Human Services. Women and Smoking: A Report of the Surgeon General. Rockville, MD: United States Department of Health and Human Services; 2001.
12. Abel EL, Hannigan JH. Maternal risk factors in fetal alcohol syndrome: provocative and permissive influences. *Neurotoxicol Teratol* 1995;17:445–462. [PubMed: 7565491][erratum appears in *Neurotoxicol Teratol* 1995 Nov-Dec;17(6):689].
13. National Institute on Alcohol Abuse and Alcoholism. Alcohol Alert: Fetal alcohol exposure and the brain. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism; 2000.
14. Konovalov HV, Kovetsky NS, Bobryshev YV, Ashwell KW. Disorders of brain development in the progeny of mothers who used alcohol during pregnancy. *Early Hum Dev* 1997;48:153–166. [PubMed: 9131316]
15. Sokol RJ, Delaney-Black V, Nordstrom B. Fetal alcohol spectrum disorder. *J Am Med Assoc* 2003;290:2996–2999.
16. Kennare R, Heard A, Chan A. Substance use during pregnancy: risk factors and obstetric and perinatal outcomes in South Australia. *Aus Nz J Of Obstet Gynaecol* 2005;45:220–225.
17. Braude MC, Szeto HH, Kuhn CM, Bero L, Ignar D, Field E, et al. Perinatal effects of drugs of abuse. *Fed Proc* 1987;46:2446–2453. [PubMed: 3494635]
18. Chasnoff IJ. Cocaine, pregnancy, and the neonate. *Women Health* 1989;15:23–35. [PubMed: 2815788]
19. Chasnoff IJ. Drug use in pregnancy. *New York State J Med* 1989;89:255. [PubMed: 2733886]
20. Chasnoff IJ, Burns KA, Burns WJ. Cocaine use in pregnancy: perinatal morbidity and mortality. *Neurotoxicol Teratol* 1987;9:291–293. [PubMed: 3683346]
21. Keith LG, MacGregor S, Friedell S, Rosner M, Chasnoff IJ, Sciarra JJ. Substance abuse in pregnant women: recent experience at the Perinatal Center for Chemical Dependence of Northwestern Memorial Hospital. *Obstet Gynecol* 1989;73:715–720. [PubMed: 2704496]
22. MacGregor SN, Keith LG, Bachicha JA, Chasnoff IJ. Cocaine abuse during pregnancy: correlation between prenatal care and perinatal outcome. *Obstet Gynecol* 1989;74:882–885. [PubMed: 2586952]
23. MacGregor SN, Keith LG, Chasnoff IJ, Rosner MA, Chisum GM, Shaw P, et al. Cocaine use during pregnancy: adverse perinatal outcome. *Am J Obstet Gynecol* 1987;157:686–690. [PubMed: 3631169]
24. Azuma SD, Chasnoff IJ. Outcome of children prenatally exposed to cocaine and other drugs: a path analysis of three-year data. *Pediatrics* 1993;92:396–402. [PubMed: 7689727]
25. Griffith DR, Azuma SD, Chasnoff IJ. Three-year outcome of children exposed prenatally to drugs. *J Am Acad Child Psy* 1994;33:20–27.
26. O'Campo P, Faden RR, Brown H, Gielen AC. The impact of pregnancy on women's prenatal and postpartum smoking behavior. *Am J Prev Med* 1992;8:8–13. [PubMed: 1576004]
27. Stotts AL, DiClemente CC, Carbonari JP, Mullen PD. Postpartum return to smoking: staging a "suspended" behavior. *Health Psychol* 2000;19:324–332. [PubMed: 10907650]
28. Curry SJ, McBride C, Grothaus L, Lando H, Pirie P. Motivation for smoking cessation among pregnant women. *Psychol Addict Behav* 2001;15:126–135. [PubMed: 11419228]
29. Corse SJ, Smith M. Reducing substance abuse during pregnancy. Discriminating among levels of response in a prenatal setting. *J Subst Abuse Treat* 1998;15:457–467. [PubMed: 9751005]
30. Moran S, Thorndike AN, Armstrong K, Rigotti NA. Physicians' missed opportunities to address tobacco use during prenatal care. *Nicotine Tob Res* 2003;5:363–368. [PubMed: 12791532]
31. Hahn SR, Kroenke K, Spitzer RL, Brody D, Williams JB, Linzer M, et al. The difficult patient: prevalence, psychopathology, and functional impairment. *J Gen Intern Med* 1996;11:1–8. [PubMed: 8691281][see comment][erratum appears in *J Gen Intern Med* 1996 Mar;11(3):191].
32. Chappel JN, Schnoll SH. Physician attitudes. Effect on the treatment of chemically dependent patients. *J Am Med Assoc* 1977;237:2318–2319.
33. Fisher JC, Keeley KA, Mason RL, Fisher JV. Physicians and alcoholics. Factors affecting attitudes of family-practice residents toward alcoholics. *J Stud Alcohol* 1975;36:626–633. [PubMed: 239284]
34. Fisher JC, Mason RL, Keeley KA, Fisher JV. Physicians and alcoholics. The effect of medical training on attitudes toward alcoholics. *J Stud Alcohol* 1975;36:949–955. [PubMed: 240074]

35. Fisher JV, Fisher JC, Mason RL. Physicians and alcoholics. Modifying behavior and attitudes of family-practice residents. *J Stud Alcohol* 1976;37:1686–1693. [PubMed: 1003983]
36. Diekman ST, Floyd RL, Decoufle P, Schulkin J, Ebrahim SH, Sokol RJ. A survey of obstetrician-gynecologists on their patients' alcohol use during pregnancy. *Obstet Gynecol* 2000;95:756–763. [PubMed: 10775743]
37. Floyd RL, Belodoff B, Sidhu J, Schulkin J, Ebrahim SH, Sokol RJ. A survey of obstetrician-gynecologists on their patients' use of tobacco and other drugs during pregnancy. *Prenat Neonat Med* 2001;6:201–207.
38. Hartmann KE, Wechter ME, Payne P, Salisbury K, Jackson RD, Melvin CL. Best practice smoking cessation intervention and resource needs of prenatal care providers. *Obstet Gynecol* 2007;110:765–770. [PubMed: 17906007]
39. Abatemarco DJ, Steinberg MB, Delnevo CD. Midwives' knowledge, perceptions, beliefs, and practice supports regarding tobacco dependence treatment. *J Midwifery Wom Heal* 2007;52:451–457.
40. Jordan TR, Dake JA, Price JH. Best Practices for Smoking Cessation in Pregnancy: Do Obstetrician/Gynecologists Use Them in Practice? *J Womens Health* 2006;15:400–441.
41. Glaser, BG.; Strauss, AL. *Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago, IL: Aldine de Gruyter; 1967.
42. Atlas.ti. *The Knowledge Workbench*. Vol. 5.2.9 ed. Berlin, Germany: Scientific Software Development; 1993–2008.
43. Weitzman EA. Analyzing Qualitative Data with Computer Software. *Health Serv Res* 1998;34:1241–1263. [PubMed: 10591282]
44. Price JH, Jordan TR, Dake JA. Obstetricians and gynecologists' perceptions and use of nicotine replacement therapy. *J Commun Health* 2006;31:160–175.
45. Grimley DM, Bellis JM, Raczynski JM, Henning K. Smoking cessation counseling practices: a survey of Alabama obstetrician-gynecologists. *Southern Med J* 2001;94:297–303.
46. Chapin J, Root W. American College of Obstetricians and G. Improving obstetrician-gynecologist implementation of smoking cessation guidelines for pregnant women: an interim report of the American College of Obstetricians and Gynecologists. *Nicotine Tob Res* 2004;6:S253–S257. [PubMed: 15203825]
47. Ferry LH, Grissino LM, Runfola PS. Tobacco dependence curricula in US undergraduate medical education. *J Am Med Assoc* 1999;282:825–829.[see comment]
48. Spangler JG, George G, Foley KL, Crandall SJ. Tobacco intervention training: current efforts and gaps in US medical schools. *J Am Med Assoc* 2002;288:1102–1109.
49. Powers CA, Zapka JG, Bogner B, Dube C, Hyder Ferry L, Ferguson KJ, et al. Evaluation of current tobacco curriculum at 12 US medical schools. *J Cancer Educ* 2004;19:212–219. [PubMed: 15725638]
50. American College of Obstetricians and Gynecologists. *Smoking Cessation*. Women's Health Issues. 2008 [cited 2008 January 28, 2008]. Available from: http://www.acog.org/departments/dept_web.cfm?recno=13
51. American College of Obstetricians and Gynecologists. *Guidelines for Perinatal Care*. Vol. 6th ed.. Elk Grove Village, IL and Washington D.C: American Academy of Pediatrics and American College of Obstetricians and Gynecologists; 2007.
52. Gehshan S. Missed opportunities for intervening in the lives of pregnant women addicted to alcohol or other drugs. *J Am Med Women Assoc* 1995;50:160–163.
53. Chavkin W, Paltrow LM. Physician attitudes concerning legal coercion of pregnant alcohol and drug users. *Am J Obstet Gynecol* 2003;188:298. [PubMed: 12548241][comment]. author reply 9.
54. Minkoff H, Paltrow LM, Melissa Rowland and the rights of pregnant women. *Obstet Gynecol* 2004;104:1234–1236. [PubMed: 15572482][see comment].
55. Minkoff H, Paltrow LM. The rights of "Unborn children" and the value of pregnant women. *Hastings Cent Rep* 2006;36:26–28. [PubMed: 16604895]
56. American College of Obstetricians and Gynecologists. *At-risk drinking and illicit drug use: ethical issues in obstetrics and gynecologic practice*. Washington D. C.: American College of Obstetricians and Gynecologists; 2004.

57. American College of Obstetricians and Gynecologists. *Addiction in Pregnancy*. Silver Spring, MD: American College of Nurse-Midwives; 2004.
58. Abel EL, Kruger M. Physician attitudes concerning legal coercion of pregnant alcohol and drug abusers. *Am J Obstet Gynecol* 2002;186:768–772. [PubMed: 11967505][see comment].
59. Goldschmidt L, Richardson GA, Cornelius MD, Day NL. Prenatal marijuana and alcohol exposure and academic achievement at age 10. *Neurotoxicol Teratol* 2004;26:521–532. [PubMed: 15203174]
60. Willford J, Leech S, Day N. Moderate prenatal alcohol exposure and cognitive status of children at age 10. *Alcohol Clin Exp Res* 2006;30:1051–1059. [PubMed: 16737465]
61. Willford JA, Richardson GA, Leech SL, Day NL. Verbal and visuospatial learning and memory function in children with moderate prenatal alcohol exposure. *Alcohol Clin Exp Res* 2004;28:497–507. [PubMed: 15084908]
62. Miller, WR.; Rollnick, S. *Motivational Interviewing: Preparing People for Change*. Vol. second ed. New York: The Guilford Press; 2002.
63. Dunn C, Deroo L, Rivara FP. The use of brief interventions adapted from motivational interviewing across behavioral domains: a systematic review. *Addiction* 2001;96:1725–1742. [PubMed: 11784466]
64. Bien TH, Miller WR, Tonigan JS. Brief interventions for alcohol problems: a review. *Addiction* 1993;88:315–335. [PubMed: 8461850][see comment].
65. Stotts AL, DeLaune KA, Schmitz JM, Grabowski J. Impact of a motivational intervention on mechanisms of change in low-income pregnant smokers. *Addict Behav* 2004;29:1649–1657. [PubMed: 15451133]
66. Stotts AL, Diclemente CC, Dolan-Mullen P. One-to-one: a motivational intervention for resistant pregnant smokers. *Addict Behav* 2002;27:275–292. [PubMed: 11817768]
67. Valanis B, Lichtenstein E, Mullooly JP, Labuhn K, Brody K, Severson HH, et al. Maternal smoking cessation and relapse prevention during health care visits. *Am J Prev Med* 2001;20:1–8. [PubMed: 11137767]
68. Tappin DM, Lumsden MA, Gilmour WH, Crawford F, McIntyre D, Stone DH, et al. Randomised controlled trial of home based motivational interviewing by midwives to help pregnant smokers quit or cut down. *Brit Med J* 2005;331:373–377. [PubMed: 16096304]
69. Mullins SM, Suarez M, Ondersma SJ, Page MC. The impact of motivational interviewing on substance abuse treatment retention: a randomized control trial of women involved with child welfare. *J Subst Abuse Treat* 2004;27:51–58. [PubMed: 15223094]
70. American College of Obstetricians and Gynecologists. *Drinking and Reproductive Health: A Fetal Alcohol Spectrum Disorders Tool Kit*. Washington DC: Division of Women's Health Issues, American College of Obstetricians and Gynecologists; 2006.
71. Chez, R.; Andres, R.; Chazotte, C.; Ling, F. *Illicit drug use and dependence in women: a slide lecture presentation*. Washington D.C.: American College of Obstetricians and Gynecologists; 2002.
72. Lindberg M, Vergara C, Wild-Wesley R, Gruman C. Physicians-in-training attitudes toward caring for and working with patients with alcohol and drug abuse diagnoses. *Southern Med J* 2006;99:28–35.[see comment].
73. Herzig K, Danley D, Jackson R, Petersen R, Chamberlain L, Gerbert B. Seizing the 9-month moment: addressing behavioral risks in prenatal patients. *Patient Educ Couns* 2006;61:228–235. [PubMed: 16256291]

Table 1
Sociodemographic Characteristics of Study Participants (Full study)

Characteristic	Mean (range/median) or number
Provider Participants (N=29)	
Provider type	
Obstetrics-gynecology resident physician	21
Nurse midwife	5
Nurse practitioner	3
Provider race	
Caucasian	25
African-American	1
Asian-American	3
Provider gender	
Female	29
Resident training year	
Post-graduate year 1	4
Post-graduate year 2	3
Post-graduate year 3	9
Post-graduate year 4	5
Nurse-midwife mean years of experience	9.2 (1–20; median 10)
Nurse practitioner mean years of experience	10.3 (5–18; median 8)
Patient Participants (N=51)	
Age (years)	24 (18–36)
Race	
Caucasian	30
African-American	20
Asian	1
Marital Status	
Single	43
Married	6
Divorced/separated	2
Pregnancy history	
Nulliparous	20
Prior births	31
Substance use disclosures	
Smoking	25
Alcohol	5
Illicit Drugs	10

Table 2
Sociodemographic Characteristics of Study Participants (Discussions in which patients disclosed substances use)

Characteristic	Mean (range/median) or number
Provider Participants (N=12)	
Provider type	
Obstetrics-gynecology resident physician	7
Nurse midwife	4
Nurse practitioner	1
Provider race	
Caucasian	11
Asian-American	1
Provider gender	
Female	12
Resident training year	
Post-graduate year 1	1
Post-graduate year 2	0
Post-graduate year 3	2
Post-graduate year 4	4
Nurse-midwife mean years of experience	9.2(1–20; median 10)
Nurse practitioner years of experience	8
Patient Participants (N=27)	
Age (years)	25(18–34)
Race	
Caucasian	13
African-American	14
Marital Status	
Single	26
Married	1
Pregnancy history	
Nulliparous	9
Prior births	18
Substance use disclosures	
Smoking only	16
Alcohol only	1
Illicit drugs only	1
Smoking and illicit drugs	5
Smoking, illicit drugs and alcohol	4