

ORIGINAL ARTICLE

Alcohol, Tobacco and Drug Use as Reasons for Abortion

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Abstract — **Aims:** Concern about the effects of alcohol and drug use during pregnancy is intertwined with debates about abortion. There is concern that alcohol abstinence recommendations lead women using low levels of alcohol to terminate otherwise wanted pregnancies. This study examines how women describe alcohol, tobacco and/or drug use (ATOD) as reasons for deciding to have abortions and assesses the differences between women reporting and not reporting ATOD as reasons for deciding to have an abortion. **Methods:** Data come from the UCSF Turnaway Study which recruited 956 women seeking an abortion at one of 30 US clinics between 2008 and 2010. Mixed methods were used and data were analyzed through thematic coding and logistic regression. **Results:** Nearly 5% reported ATOD as a reason for abortion. Women worried that their ATOD had affected their baby's health and that their or their partner's ATOD would influence parenting. Most women (84%) who reported alcohol as a reason binge drank or had an alcohol-problem symptom in the month before discovering their pregnancy. Sixty-one percent who reported drugs as a reason used drugs, with 88% using more than once/week. Although two-thirds smoked tobacco, no woman reported tobacco alone as a reason. Ninety-eight percent of women reporting ATOD as a reason had unintended pregnancies. **Conclusion:** Women reporting ATOD as a reason drink at levels exceeding a low threshold and do not appear to be terminating otherwise wanted pregnancies. Thus, findings are inconsistent with hypotheses that abstinence recommendations and punitive policies lead women using low levels of alcohol or using drugs to terminate otherwise wanted pregnancies.

INTRODUCTION

Although concerns regarding alcohol use during pregnancy have been present for millennia (Armstrong, 2003; Warren and Hewitt, 2009), the recent history of concern about alcohol and also drug use during pregnancy is intertwined with debates about abortion that occurred in the context of *Roe v. Wade* (Murphy and Rosenbaum, 1999; Armstrong, 2003; Golden, 2005). Historian Golden (2005) argues that the existence of a medical solution to fetal alcohol syndrome (FAS)—i.e. abortion—made the public willing to accept FAS as a medical problem. In fact, one of the first articles published about FAS in the USA suggested that ‘serious consideration be given to early termination of pregnancy in severely chronic alcoholic women’ (Jones and Smith, 1975, p. 1). This recommendation was echoed elsewhere (Beyers and Moosa, 1978; Majewski *et al.*, 1978). Others argued that calls for termination were alarmist (Armstrong and Abel, 2000). These calls for termination persisted until 1980, when according to Armstrong and Abel, prospective studies suggested FAS was a relatively rarer outcome of maternal alcoholism (2000).

In the 1980s, official recommendations regarding alcohol use during pregnancy began focusing on abstinence. At this point, some people began to express concern that abstinence recommendations would lead women who had ‘occasional’ or ‘light drinking’ before discovering pregnancy to terminate or consider terminating otherwise wanted pregnancies (Lipson and Webster, 1990; Koren, 1991; Koren *et al.*, 1996). Such concerns persist (Armstrong and Abel, 2000; Lawson, 2005; Todorow *et al.*, 2010) and are reflected in new guidelines from Canadian and US Obstetrics and Gynecology professional associations. These guidelines explicitly state that low levels of alcohol use in early pregnancy are not an indication for termination (Carson *et al.*, 2010; American College of Obstetricians and Gynecologists,

2011). Despite concerns that alcohol-abstinence recommendations lead women to terminate otherwise wanted pregnancies, only anecdotal evidence has been published (Koren and Pastuszak, 1990; Koren, 1991).

In relation to drug use, politicians used images of ‘crack babies’ and focused on the effects of drug use on fetal health to position themselves on abortion (Murphy and Rosenbaum, 1999; Paltrow, 1999). Legal scholars argue that policies punishing pregnant women for drug use punish women for carrying pregnancies to term, i.e. for not having abortions (Roberts, 1999). Anti-abortion rights activists opposed punitive policies for this reason (Gomez, 1997). These activists feared that the policies would lead women to have abortions. However, while punitive policies are in place (Gomez, 1997; Roberts, 1999; Guttmacher Institute, 2011), there is no evidence from published research that punitive policies have had this effect. Abstinence from drugs (and tobacco) during pregnancy is recommended (CDC, 2012; March of Dimes, 2012). Yet, the literature has not focused on whether drug or tobacco abstinence recommendations lead women using drugs and/or tobacco to terminate pregnancies.

One way to examine whether abstinence recommendations and punitive policies lead women to terminate otherwise wanted pregnancies is to examine women's reasons for obtaining abortions. Previous research suggests that alcohol, tobacco and/or drug use (ATOD) does not rank high among the reasons women decide to have abortions (Glander *et al.*, 1998; Broen *et al.*, 2005; Finer *et al.*, 2005; Kirkman *et al.*, 2009; Rowe *et al.*, 2009). Of studies finding ATOD as a reason for abortion, none have examined ways in which women talk about why the use is a concern, the level of use about which women worried, or whether pregnancies were otherwise wanted.

Further, although few women report ATOD as a reason for abortion, alcohol and drug use is common among women receiving abortions (Costa *et al.*, 1987; Mensch and

Kandel, 1992; Prager *et al.*, 2007; Falcon *et al.*, 2010; Cannon *et al.*, 2012). Thus, other factors may explain which women report ATOD as a reason. For example, Hancock *et al.* suggest that women who are conflicted in their decision about whether to have an abortion may cite exposure to a teratogen as a reason, and women who are anxious may have unrealistically high perceptions of risks to their fetus due to exposures to teratogens (2007, p. 127).

The current study uses data collected as part of the Turnaway Study, a study of women seeking abortions in the USA, to examine whether women reporting ATOD as a reason are using low levels of alcohol, terminating otherwise wanted pregnancies or reporting high levels of anxiety/depression and difficulty deciding to have an abortion. Specifically, we:

- (a) Examine how women describe ATOD as a reason for abortion.
- (b) Describe ATOD use patterns of women reporting ATOD as a reason.
- (c) Assess differences between women reporting ATOD versus not reporting ATOD as a reason, including pregnancy intentions.
- (d) Test the hypothesis that women who had difficulty deciding whether to have an abortion and women with depression/anxiety have higher odds of reporting ATOD as a reason.

METHODS

Data source

This mixed methods study analyzes data from baseline interviews conducted as part of the Turnaway Study. The Turnaway Study was designed to assess the effect of receiving versus being denied an abortion on women's physical and mental health and socioeconomic well-being. Women seeking an abortion at 1 of 30 clinics throughout the USA between January 2008 and December 2010 were recruited for participation in the study. Abortion facilities' gestational age limits vary widely across the USA due to either facility restrictions (e.g. training of providers in some but not all abortion procedures), or legal restrictions at the state level. Turnaway Study sites were selected based on the criterion that no other facility within 150 miles had a later gestational limit for providing abortion. Facilities were identified using the National Abortion Federation directory and contacts within the abortion research community. All but two sites agreed to participate, one of which was replaced with a facility with an identical catchment area and similar patient volume. Recruitment sites were located throughout the USA, reported a median of 2400 abortions in 2010 (range: 440–8000), and had gestational limits from 10 weeks through the end of the second trimester. More details about recruitment sites have been published previously (Gould *et al.*, 2012).

Participant recruitment began at one abortion facility in January 2008 and gradually expanded over the next 3 years. Eligible participants were pregnant English- or Spanish-speaking women, aged 15 years or older, with no known fetal anomalies or demise, presenting for abortion care within the gestational age range of one of three study groups.

The three groups included women who presented for abortion care (1) up to 3 weeks over a facility's gestational limit and were denied abortion care ('Turnaways'), (2) up to 2 weeks under the limit and received abortions ('abortion controls') or (3) under the limit and in their first trimester ('first trimester controls'). Of eligible participants approached, 37.5% ($n=1132$) consented to participate. Of those who consented, 85% ($n=956$) participated in the baseline interview. The baseline interview took place by telephone a week after women sought the abortion. The final sample includes 231 Turnaways, 452 abortion controls and 273 first-trimester patients ($n=956$). The current paper combines the three groups for analysis. A variable for seeking a first trimester abortion is included in analyses.

The Turnaway Study has been approved by the University of California, San Francisco Committee for Human Research.

Measures

Outcome: alcohol/drug use as reasons for abortion

Women were asked the open-ended question 'What are some of the reasons you decided to have an abortion?' The interviewer was prompted to keep asking 'Any other reasons?' until the participant said that is all. Women offering more than one reason were asked 'What would you say was the main reason you decided to have an abortion?' Women who mentioned ATOD as either a reason or as a main reason, including their or their partner's use or recovering from a substance use disorder, were classified as reporting ATOD as a reason. We combined the reasons and main reasons for analysis purposes because women often did not report a main reason, reported more than one main reason and reported new reasons as main reasons. Responses were coded separately by Drs Foster and Roberts and Ms Sinkford. Differences were resolved through consensus.

ATOD use

Alcohol. Binge/problem use was defined as consuming five or more drinks on a single occasion or having one or more alcohol-related problems (1) having a drink first thing in the morning to steady nerves or get rid of hangover—eye-opener—or (2) being unable to remember what happened the night before because of drinking—blackout—in the month prior to pregnancy recognition. Binge frequency is defined as the number of past month >5 occasions. Non-binge alcohol use was alcohol use over the past month without binge drinking or either alcohol-related problem. All alcohol use variables correspond to the month prior to pregnancy recognition.

Drugs. Any drug use is any illicit drug or prescription drug misuse during the month prior to pregnancy recognition. Type of drug was dichotomized as marijuana only versus other drugs (i.e. methamphetamine, cocaine, heroin and prescription drug misuse) with or without marijuana. Marijuana was examined separately because there is less evidence of harms due to use during pregnancy than with other drugs (English *et al.*, 1997). Drug frequency is <1 time per week, 1–3 times per week and ≥4 times per week. All drug use was assessed for the month before discovering pregnancy.

Tobacco. Tobacco is a dichotomous variable of any versus no tobacco in the month before the baseline interview.

Demographic characteristics

Age, race/ethnicity (White, Black, Hispanic/Latina and other), education (more than high school versus high school graduation or less than high school), employed (part/full time versus not employed) and poverty [household income below 100, $100 \leq 200$ and rather than above 200% of the federal poverty threshold (FPL)] were all considered.

Pregnancy-related characteristics

We also considered parity (nulliparous versus parity ≥ 1) and gestational age (weeks at recruitment) and the gestational age women discovered pregnancy (weeks). Other pregnancy-related characteristics were: difficulty deciding which was a dichotomous measure defined as making the decision to have an abortion was very difficult versus somewhat difficult, neither easy nor difficult, somewhat easy and very easy. Pregnancy intentions were measured with the London Measure of Unplanned Pregnancy. The London Measure is a validated measure of pregnancy intentions that assesses contraceptive use, intentions to become pregnant, extent to which women wanted to become pregnant and partner interest in becoming pregnant in the month before becoming pregnant as well as changes women may have made in preparation for pregnancy and women's perceptions of the timing of the pregnancy (Barrett *et al.*, 2004). It is continuous (scale 1–12, with < 3 indicating unplanned pregnancies).

Health care and health

'Has healthcare provider' was a dichotomous variable defined as having a doctor or nurse practitioner one usually goes to when sick or wanting health advice. Self-rated health is a dichotomous variable of rating health prior to pregnancy as good or very good versus fair, poor or very poor. Chronic pain is a dichotomous variable of suffering from abdominal, pelvic, back, osteoarthritis/joint, headaches/migraines and/or other pain lasting longer than 6 months. History of depression/anxiety is dichotomous: healthcare provider has versus has not ever told the participant she suffers from a major depressive/anxiety disorder. History of child abuse/neglect is dichotomous: having been physically abused, sexually abused and/or seriously neglected in childhood.

Analysis

Qualitative data were analyzed through thematic coding (Miles and Huberman, 1994; Maxwell, 2005) to address objective 1. Mixed effects logistic regressions were conducted for bivariate analyses to describe ATOD use patterns of women reporting ATOD as a reason for seeking an abortion and to assess differences between women reporting ATOD versus not reporting ATOD as a reason (objectives 2 and 3). Multivariable mixed effects logistic regression was used to assess whether women who had difficulty deciding whether to have an abortion and women with depression/anxiety have higher odds of reporting ATOD as a reason (objective 4). Our quantitative analysis approach accounted for clustering by recruitment site and was conducted in STATA 12.

RESULTS

Qualitative results

ATOD use as reasons

Forty-six participants (4.8%) mentioned ATOD as a reason for deciding to have an abortion. ATOD was the only reason for seven ($< 1\%$) (not shown). Twenty-five (2.6%) reported alcohol, four ($< 0.5\%$) tobacco and 28 (2.9%) drugs as a reason. Seven (15% of those reporting ATOD) reported both alcohol and drugs as reasons. No woman reported tobacco without also mentioning alcohol or drugs.

How use influenced decision

Direct effects on fetal health. Some who mentioned ATOD as a reason mentioned concerns that their use had or would affect their baby's health if they were to continue the pregnancy.

'I was drinking quite a bit. I didn't want the baby to come out with any problems'. – binged 5 \times the month before discovering pregnancy at 13 weeks. Sought abortion at 22 weeks.

'I was worried about fetal alcohol syndrome'. – binged 1 \times , had two blackouts, and used marijuana daily the month before discovering pregnancy at 23 weeks. Smoked cigarettes. Sought abortion at 24 weeks.

'I was using drugs and on methadone. I didn't want to have an unhealthy baby'. – used heroin 4–6 \times /week the month before discovering pregnancy at 5 weeks. Smoked cigarettes. Sought abortion at 22 weeks.

A few used words such as 'chance', while others used more definitive language, such as 'knew the thing wasn't healthy'.

Parenting. Others described alcohol/drug use in the context of parenting. This was primarily a concern in relation to drugs. Only one woman mentioned alcohol in relation to parenting.

One aspect of parenting concern focused on raising children in the context of their own or their partner's 'alcoholic' and drug 'lifestyles'.

'Being an alcoholic ... I didn't feel it would be the best thing to bring a child into my lifestyle'. – binge drank every day, had an eye opener every day, and blacked out 15 \times the month before discovering pregnancy at 8 weeks. Smoked cigarettes. Sought abortion at 8 weeks.

'The father ... is a drug addict and ... I don't want to have the baby deal with his lifestyle. – no use reported. Discovered pregnancy at 14 weeks, sought abortion at 26 weeks.

'Because of the...methadone. I'm trying to get off of it and worked very hard to get off of it. I don't believe in raising a child on it'. – Discovered pregnancy at 5 weeks. Smoked cigarettes. Sought abortion at 8 weeks.

The other aspect was lack of ability or readiness to parent due to where they were in recovery from drug use disorders.

'I had only six months clean from heroin... I am on track for drug addiction and wanted to finish those classes before I had kids'. – Discovered pregnancy at 8 weeks. Smoked cigarettes. Sought abortion at 8 weeks.

'I am trying to put my life back together. If I wasn't living in the treatment center, I would be homeless, I don't have a job'. – Discovered pregnancy at 13 weeks. Smoked cigarettes. Sought abortion at 14 weeks.

Non-specific reasons. Other women mentioned ATOD without further explanation. They expressed concern in such a way that the assumed reasons alcohol/drugs would lead them to have an abortion were so obvious they did not require explanation.

'I was drinking a lot before I found out'. – binged 4× and used marijuana <1×/week the months before discovering pregnancy at 22 weeks. Sought abortion at 23 weeks.

'I had a couple of drinks before I found out'. – binged 5× and used methamphetamine and/or cocaine <1×/week the month before discovering pregnancy at 4 weeks. Sought abortion at 11 weeks.

'Because before I found out I was doing all those drugs and stuff'. – binged and used prescription drugs recreationally 1–3×/week before discovering pregnancy at 14 weeks. Smoked cigarettes. Sought abortion at 22 weeks.

Quantitative results

Patterns of ATOD use

Of the women reporting ATOD as a reason for seeking an abortion, 52% binge drank and/or had an alcohol-related problem symptom in the month before discovering pregnancy (Table 1). Fifty percent had used drugs before discovering

pregnancy, with marijuana being the most common drug. Women using drugs reported frequent drug use, with 74% using them more than once a week and 30% using them daily. Sixty-five percent sought the abortion after the first trimester (Table 2).

Among women reporting alcohol as a reason ($n = 25$), all had consumed alcohol before discovering pregnancy, with 84% reporting they binge drank/had a problem symptom. Almost two-thirds (63%) reporting bingeing the month before discovering pregnancy binged more than once a week, with a median of five binges in the month before discovering pregnancy (range: 1–30). Seven had blacked out, with a median of two blackouts (range: 1–24).

Among women reporting drugs as a reason ($n = 28$), 61% used drugs in the month before discovering pregnancy, with 18% reporting that they used marijuana only and 43% reporting they used other drugs. Most women reporting drug use used it more than four times a week. Of the 11 women reporting drugs as a reason who did not report drug use in response to drug survey questions, three described a partner's use as the reason, six mentioned treatment or recovery as the reason, one mentioned both partner's use and recovery and one misusing prescription painkillers had not used them in the month before discovering pregnancy. In addition, 57% of those reporting drugs as a reason used alcohol and 32% binge drank before in the month discovering pregnancy.

Differences in women reporting ATOD versus non-ATOD reasons for seeking abortion

Binge drinking/alcohol-related problems, tobacco use and drug use were more common among women reporting ATOD use compared with women not reporting ATOD use as a reason for seeking an abortion (Table 1). Among women who reported ATOD use as a reason, half binge

Table 1. Alcohol, tobacco and drug use among women reporting ATOD as a reason for seeking an abortion

	Non-alcohol/drug reasons ($n = 910$)	ATOD as reason ($n = 46$)	<i>P</i> -value	Alcohol reason ^a ($n = 25$)	Drug reason ^a ($n = 28$)
No alcohol	45%	26%	Ref	0%	43%
Non-binge alcohol	33%	22%	ns	16%	25%
Binge/problem alcohol- Binge frequency ^b	23%	52%	***	84%	32%
<1 × per week	73%	40%	Ref	37%	—
1–3 × per week	26%	45%	*	47%	—
≥4 × per week	1%	15%	**	16%	—
Eye opener	1%	2%	ns	4%	—
Blackout	5%	15%	**	28%	—
Tobacco use	37%	67%	***	60%	71%
No drug use	87%	50%	Ref	52%	39%
Marijuana only	10%	20%	**	24%	18%
Other drugs	3%	30%	***	24%	43%
Drug use frequency ^c					
<1 × per week	30%	26%	Ref	—	12%
1–3 × per week	30%	22%	ns	—	29%
≥4 × per week	40%	52%	ns	—	59%

Percentages may not add up to 100 due to rounding.

ns, non-significant.

ATOD as reason compared with non-alcohol/drug reasons.

^aAlcohol as a reason and drug as a reason are not mutually exclusive categories. No statistical tests done.

^bTwo in the ATOD as reasons group who reported bingeing did not report a binge frequency. Denominator is those reporting bingeing.

^cDenominator is those reporting drug use.

* $P < 0.05$.

** $P < 0.01$.

*** $P < 0.001$.

Table 2. Substance use, demographic and reproductive health characteristics

	Non-alcohol/drug reasons (<i>n</i> = 910)	ATOD as a reason (<i>n</i> = 46)	<i>P</i> -value
Demographics			
Age (mean)	25.4	25.0	ns
Poverty			
<100% FPL	35%	34%	Ref
100–200% FPL	24%	22%	ns
>200% FPL	15%	13%	ns
FPL missing	26%	32%	ns
Employed	35%	54%	*
>high school	54%	47%	ns
Race/ethnicity			
White	59%	36%	Ref
Black	9%	30%	**
Hispanic/Latina	20%	21%	ns
Other race/ethnicity	13%	13%	ns
Married	7%	9%	ns
Reproductive health			
Nulliparous	41%	36%	ns
Gestational age in weeks (mean)	17.3	16.1	ns
Gestational age discovered pregnancy in weeks (mean)	11.5	9.2	*
Gestational age discovered categories			
<8 weeks	56%	43%	Ref
8≤14 weeks	22%	22%	ns
14+ weeks	22%	35%	*
Time between discovered and seeking abortion			
≤1 month	48%	44%	Ref
>1–2 months	24%	20%	ns
>2 months	28%	36%	ns
First trimester of pregnancy	35%	41%	ns
Difficulty deciding	44%	26%	*
Pregnancy intentions (mean)	2.67	2.73	ns
Other health			
Has healthcare provider	37%	45%	ns
Self-rated health good/very good	74%	81%	ns
Chronic pain	50%	36%	ns
Hx depression/anxiety	63%	27%	***
Hx child abuse/neglect	30%	24%	ns

ns, non-significant.

**P* < 0.05.

***P* < 0.01.

****P* < 0.001.

drank before discovering pregnancy compared with approximately a quarter of the women not reporting ATOD as a reason (*P* < 0.001). There were similar differences for drugs. Half of the women reporting ATOD used drugs before discovering pregnancy compared with 13% not reporting ATOD as a reason, with higher marijuana only and also other drug use among those reporting ATOD as a reason (*P* < 0.01 and *P* < 0.001, respectively). More women reporting ATOD as a reason used tobacco (67% versus 37%, *P* < 0.001). There were no differences between women who reported ATOD as a reason and those who did not in non-binge/no problem alcohol use before discovering pregnancy.

There were a few other differences between women who reported ATOD as a reason for seeking an abortion compared with those women whose reason for an abortion was not ATOD (Table 2). Fewer women reporting ATOD as a reason were employed (35 versus 54%, *P* < 0.05), while more had a history of depression/anxiety (63 versus 27%, *P* < 0.001) and difficulty deciding whether they should get an abortion (44 versus 26%, *P* < 0.05). Women reporting ATOD as a reason also discovered pregnancies later (11.5 versus 9.2 weeks of gestation, *P* < 0.05). Further, Black

women had lower odds of reporting ATOD as a reason compared with White women (*P* < 0.001).

Pregnancy intentions

There were no differences in pregnancy intentions. Only one woman reporting ATOD as a reason had an intended pregnancy. Qualitative data indicate that her partner's resumption of drug use was the reason for abortion.

Difficulty deciding and depression/anxiety

In the multivariable model, women who had difficulty deciding whether to have an abortion had about three and a half times the odds of reporting ATOD as a reason for seeking an abortion [odds ratio (OR): 3.47, 95% confidence interval (CI) 1.71–7.03]. Similarly, women with a history of anxiety/depression had over three and a half times the odds of reporting ATOD as a reason (OR: 3.57, 95% CI 1.71–7.46). (See Table 3) Using drugs other than marijuana and discovering pregnancy later were positively associated with reporting ATOD as a reason, while employment was negatively associated with reporting ATOD as a reason.

Table 3. Logistic regression model predicting reporting ATOD as a reason

	Odds ratio	P-value	95% CI	
No alcohol	Ref			
Non-binge alcohol	0.90	0.816	0.36	2.26
Binge/problem alcohol	1.93	0.122	0.84	4.44
No drugs	Ref			
Marijuana only	1.85	0.183	0.75	4.55
Other drugs	14.90	<0.001	5.88	37.78
Tobacco	1.92	0.087	1.91	4.03
Age	1.00	0.935	0.94	1.06
Employed	0.38	0.009	0.18	0.78
White	Ref			
Black	0.38	0.116	0.12	1.27
Hispanic/Latina	0.65	0.364	0.26	1.64
Other race/ethnicity	1.03	0.950	0.38	2.83
Gestational age discovered pregnancy	1.11	<0.001	1.05	1.17
Difficulty deciding	3.47	0.001	1.71	7.03
Hx depression/anxiety	3.57	<0.001	1.71	7.46

DISCUSSION

About 1 in 20 women surveyed cited ATOD as a reason for having an abortion. Eighty-four percent of those citing alcohol as a reason had binged or had an alcohol-related problem-symptom and about half binged more than once a week before discovering their pregnancy. This level of drinking exceeds a low threshold (O'Leary and Bower, 2011). Thus, study findings are inconsistent with the premise that women drinking at low levels are terminating pregnancies due to concerns about the effects of low-levels of alcohol consumption.

However, given that ~5% did state that ATOD was a reason, it is worth examining women's concerns in the context of evidence about harms associated with use in the patterns they report. In regards to alcohol, women were primarily concerned with direct health effects on the fetus. There is strong evidence that women who drink heavily are at high risk of FAS and other alcohol-related fetal harms (May *et al.*, 2005; May *et al.*, 2008). It is important to note, though, that there are questions about the proportion of infants exposed (even) to heavy alcohol use who experience harms (Armstrong and Abel, 2000). In relation to binge drinking (which was assessed in this study), a recent systematic review concluded that the only convincing evidence of associations between binge drinking during pregnancy and pregnancy outcomes was for neurodevelopment (Henderson *et al.*, 2007). Research published subsequently has found positive associations between binge drinking during pregnancy and infant temperament and sleep patterns, neonatal asphyxia, language delay, childhood mental health problems, stillbirth and post-neonatal mortality (Strandberg-Larsen *et al.*, 2008, 2009; Sayal *et al.*, 2009; O'Leary *et al.*, 2010; Alvik *et al.*, 2011; Meyer-Leu *et al.*, 2011). However, other than the few reporting binge most days, it is unclear whether women in the sample were heavy drinkers who also binged (e.g. drink 2–4 drinks most days and drink >5 1–2 times per week) or occasional binge drinkers (e.g. drink >5 per occasion, but drink 1–2 times per month) (O'Leary *et al.*, 2010). Some recent research distinguishes heavy drinking from occasional binge drinking (e.g. O'Leary *et al.*, 2009; Strandberg-Larsen *et al.*, 2009). However, biases due to misclassification of

heavy as occasional binge drinking plagues research about binge drinking during pregnancy and may lead to overstatements of harms (Gmel *et al.*, 2011). Given the state of the evidence, women's concerns that their drinking may have affected the health of their fetuses are legitimate. While there is no evidence that women reporting ATOD as a reason were terminating otherwise wanted pregnancies, it remains unclear whether risks associated with levels of drinking in the sample would warrant terminating otherwise wanted pregnancies.

In contrast to alcohol, women mentioned drugs both in relation to direct effects (similar to alcohol) and parenting. No woman mentioned fear of punishment. The focus on both direct effects and parenting is consistent with research about effects of drug use during pregnancy (Frank *et al.*, 2001; Lester *et al.*, 2004). Regarding direct effects, research suggests cocaine, methamphetamine, opiates and high levels of marijuana during pregnancy are associated with negative outcomes such as preterm birth and low birthweight (English *et al.*, 1997; Hulse *et al.*, 1997; Addis *et al.*, 2001; Behrman and Stith Butler, 2007; Schempf, 2007; Nguyen *et al.*, 2010; Gouin *et al.*, 2011). Infants of women using opiates are at risk of Neonatal Abstinence Syndrome (Finnegan *et al.*, 1975; Jones *et al.*, 2010; Kellogg *et al.*, 2011). However, evidence about the most studied drug (cocaine) does not support initial claims regarding a uniquely harmful syndrome associated with prenatal exposure (Frank *et al.*, 2001). Instead, harms associated with cocaine during pregnancy are in line with 'severity, scope and kind' of other risks, including tobacco (Frank *et al.*, 2001). Women may have overestimated the effects of drug use. In contrast, they may have underestimated effects of tobacco use—only four women mentioned tobacco as a reason and no woman cited only tobacco even though tobacco use was high (67% among ATOD as reason and 37% among other women). This discrepancy between drugs and tobacco is important, given extensive evidence about harms of smoking during pregnancy and around infants (DiFranza and Lew, 1995; Burke *et al.*, 2012). A recent study found quitting smoking may be more important for infant outcomes than quitting drugs during pregnancy (Bailey *et al.*, 2012).

In regards to parenting, disentangling actual risk from stigma associated with mothers using drugs can be difficult (Noble *et al.*, 2000). However, most studies indicate a higher risk of Child Protective Services involvement for children prenatally exposed to drugs (Neuspiel *et al.*, 1993; Doris *et al.*, 2006; Friedman *et al.*, 2009). A risk to children's well-being among children of women with substance use disorders has also been noted (Conners *et al.*, 2003; Haller and Miles, 2003). However, it is unclear whether prenatal drug use *per se* increases risk, or whether myriad risks associated with drug use cause adverse outcomes (Lester *et al.*, 2004).

Consistent with Hancock *et al.*'s hypotheses, women with difficulty deciding and with depression/anxiety had higher odds of reporting ATOD as a reason. Those with difficulty deciding could have cited ATOD because it might be a more socially acceptable reason for abortion. Alternatively, concerns about the effects of alcohol/drugs might tip the scales towards abortion for women having difficulty deciding. Women with depression/anxiety may be especially attentive or vulnerable to information about risks associated with alcohol/drug use during pregnancy. In cases where

pregnancy is otherwise wanted, women with depression/anxiety who used ATOD before discovering pregnancy may need additional counseling about level and types of risks.

Regarding pregnancy wantedness, only one woman reporting ATOD as a reason had planned her pregnancy. There was no difference in pregnancy intentions between those reporting and not reporting ATOD as a reason. As a way of confirming our findings, we conducted some additional *post hoc* analyses. First, because of the positive association between difficulty deciding and reporting ATOD as a reason and the possibility that those with higher pregnancy intentions could have had more difficulty deciding, we assessed the association between pregnancy intentions and difficulty deciding. We found a positive association between pregnancy intentions and difficulty deciding. However, when we included both pregnancy intentions and difficulty deciding in a model predicting reporting ATOD as a reason, pregnancy intentions remained non-significant. This confirms that there is neither a direct nor an indirect effect of pregnancy intentions on reporting ATOD as a reason. Further, additional *post hoc* analyses found no differences in specific items of the pregnancy intention scale that explicitly asked about wantedness (i.e. timing of pregnancy and extent to which women wanted to become pregnant in the month before becoming pregnant). This suggests that we can feel confident that our finding about difficulty deciding does not indicate that women reporting ATOD as a reason are terminating more wanted pregnancies.

These findings should be considered in light of limitations. First, due to the design of the Turnaway Study, women seeking abortions after the first trimester were overrepresented in this sample compared with abortion-seeking behavior in the USA. Overall, 90% of abortions in the USA are in the first trimester (Pazol *et al.*, 2011) compared with 35% in our sample. Women may have cited ATOD as a reason more often than in other studies (Kirkman *et al.*, 2009) because they were further along in pregnancy. Women further along might have exposed their fetus to alcohol/drugs for longer and had more opportunities to use alcohol/drugs. Also, discovering pregnancy later could have left less time to quit before delivery, possibly heightening potential impacts on parenting. Further, that women reporting ATOD as a reason discovered pregnancy later should be interpreted with caution. It is unclear whether women using alcohol/drugs discover pregnancy later than women not using, or whether having a longer period of exposure to substances prior to discovering pregnancy contributed to women reporting ATOD as a reason. Second, alcohol measurement has limitations. There were no usual quantity or (non-binge) frequency measures. Thus, calculating volume, identifying heavy drinkers who did not binge (e.g. those drinking 2–4 drinks/day, but never more than 4), or determining if binge drinkers also drank heavily was not possible. This is especially significant given the binge drinking threshold in the dataset was greater than five rather than greater than or equal to four (Wechsler *et al.*, 1995; NIAAA, 2004) and thus may miss some binge and heavy, non-binge drinking. Also, the study had a relatively low participation rate. Those who participated may have differed from those who declined. However, as potential participants did not know the study would include questions about ATOD, non-participation was unlikely to have been related to the outcome (ATOD as a reason for abortion).

This study also has strengths. The use of qualitative in addition to quantitative data allowed examination of what it means to offer alcohol and/or drug use as a reason for abortion. Importantly, this is one of the first papers to provide evidence to inform conversations about whether alcohol-abstinence recommendations lead women with low-levels of consumption to terminate otherwise wanted pregnancies. The findings that (1) almost all reporting alcohol as a reason drank above a 'low' threshold, (2) only 5% reported ATOD as a reason in this sample where we would expect it to be higher due to the later gestation and (3) women reporting ATOD as a reason did not plan their pregnancies suggest abstinence recommendations do not lead women with 'occasional' or 'light' drinking to terminate otherwise wanted pregnancies. Further, the study was conducted in the USA, which has had abstinence recommendations since the 1980s and has many punitive policies regarding drug use in place (Armstrong and Abel, 2000; Guttmacher Institute, 2011). If such recommendations and policies influenced women to terminate otherwise wanted pregnancies, we would expect to have seen the impact in this data set. That we did not gives us confidence in our conclusions.

CONCLUSIONS

Findings are inconsistent with hypotheses that abstinence recommendations and punitive policies lead women using low levels of alcohol or drugs to terminate otherwise wanted pregnancies. Further, most women reporting ATOD as a reason were drinking and using drugs at levels where concern about possible harm to the fetus is warranted. However, characterizing the types of harms and quantifying the level of risk associated with amounts of drinking and drug use reported are difficult. It is unclear whether drinking and using drugs at some of the levels reported by women in the sample (e.g. occasional binge drinking) should warrant considering termination of otherwise wanted pregnancies. More evidence-based information to help women characterize and understand the levels of risk associated with alcohol and drug use in a wide range of patterns is needed.

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