

Alcohol and Drug Screening of Newborns: Would Women Consent?

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Abstract

Objectives: To examine the conditions under which mothers would consent to alcohol and drug screening of their infants, and to identify predictors of screening consent.

Methods: A cross-sectional survey was administered in person by trained research assistants on the postpartum units of three hospitals in a large Canadian urban centre over four months. The survey was administered to 1509 mothers (78.4% of those eligible) who were fluent in English and had given birth within the preceding 48 hours.

Results: Mothers indicated that they would consent to screening of their newborn (1369/1460, 93.8%), and thought all mothers should consent if infants at risk would be more likely to receive effective treatment (1440/1476, 97.6%). Respondents believed that they would consent to screening if they were provided the following information: what would happen if the infant sample was positive for prenatal exposure (1431/1476, 97%); who would have access to the information (1377/1476, 93.4%); how effective medical care would be for the child (1435/1476, 97.4%); and the likelihood that a baby with a positive screen would have a problem (1444/1476, 98.1%). Self-reported alcohol use did not decrease willingness to consent. In a multivariate model, belief that universal screening would not make women feel discriminated against was a significant predictor of consent (adjusted OR 5.9; 95% CI 3.3–10.6).

Conclusion: Mothers would support a universal newborn alcohol and drug screening program if there was evidence that screening could lead to effective treatment for the mother and baby, and if appropriate resources were available.

Résumé

Objectifs : Examiner les conditions en vertu desquelles les mères consentiraient à la tenue d'un dépistage visant l'alcool et les drogues chez leur nouveau-né, et identifier les facteurs prédictifs du consentement au dépistage.

Méthodes : Un sondage transversal a été administré en personne, par des adjoints à la recherche formés, auprès des unités postpartum de trois hôpitaux d'un important centre urbain canadien, et ce, sur une période de quatre mois. Ce sondage a été administré à 1 509 mères (78,4 % des candidates admissibles) qui étaient en mesure de parler anglais avec aisance et qui avaient accouché dans les 48 heures précédentes.

Résultats : Les mères ont indiqué qu'elles consentiraient au dépistage de leur nouveau-né (1 369/1 460, 93,8 %) et estimaient que toutes les mères devraient y consentir, puisque les nouveau-nés exposés à des risques seraient alors plus susceptibles de bénéficier d'un traitement efficace (1 440/1 476, 97,6 %). Les répondantes estimaient qu'elles consentiraient au dépistage si on leur offrait les renseignements suivants : les conséquences de l'obtention d'un résultat positif quant à l'exposition prénatale du nouveau-né (1 431/1 476, 97 %); l'identité des personnes qui auraient accès à cette information (1 377/1 476, 93,4 %); l'efficacité des soins médicaux qui seraient alors offerts au nouveau-né (1 435/1 476, 97,4 %); et la probabilité selon laquelle un nouveau-né obtenant un résultat positif au dépistage pourrait en venir à connaître des problèmes (1 444/1 476, 98,1 %). L'autosignalement de la consommation d'alcool n'entraînait pas une baisse de la volonté de consentir au dépistage. Dans le cadre d'un modèle multivarié, l'opinion selon laquelle les femmes n'auraient pas l'impression de faire l'objet de discrimination si l'on avait recours au dépistage universel constituait un facteur prédictif considérable du consentement (RC corrigé, 5,9; IC à 95 %, 3,3–10,6).

Conclusion : Les mères appuieraient un programme universel de dépistage visant l'alcool et les drogues chez les nouveau-nés, si les données indiquaient que le dépistage pourrait mener à l'offre d'un traitement efficace à la mère et à l'enfant, et si les ressources appropriées étaient disponibles.

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INTRODUCTION

Current guidelines in North America advise that women who are pregnant or trying to conceive should abstain from alcohol, drugs, and tobacco.^{1–4} However, alcohol use in the first trimester is reported in 12% to 60% of women, use of illegal drugs in the month before delivery is reported in up to 5% to 8.8% of women, and tobacco use by 13% to

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25% of women.⁵⁻⁷ Maternal alcohol use during pregnancy can lead to fetal alcohol spectrum disorder (FASD), the most common group of non-genetic birth defects with major medical, economic, and social impact.⁸⁻¹¹ Prenatal drug exposure can result in permanent health problems including developmental delay.^{12,13} Prenatal tobacco use is a risk factor for intrauterine growth restriction.⁶ Early diagnosis and intervention can reduce the risk of some exposure-related disabilities.^{14,15}

Maternal and neonatal characteristics including prenatal visits, neonatal behaviour, and birth weight identify some infants but do not reliably identify all exposed infants.^{5,9,16,17} In addition, the prevalence of alcohol and drug use exceeds that identified through self-report or targeted screening.¹⁸⁻²¹ To address the issue of under-identification of substance-exposed infants, the analysis of infant biomarkers has recently been considered.²²⁻²⁹ These tests may identify children at risk for deficits much earlier than previously possible and assist in targeting interventions. Targeted urinalysis of newborns for drug metabolites is already used in some regions.³⁰⁻³² In the absence of a universal screening program, however, it is unclear under what circumstances screening should be performed, how and when testing is performed, how results should be used, whether informed consent from a mother is required, and whether it is ethical to obtain a neonatal sample without consent when it identifies maternal behaviour (i.e., *de facto* test of mother). There is considerable variation between existing programs with regard to these aspects.³⁰⁻³² In addition, there is the potential for discrimination with the use of targeted alcohol and drug screening.^{19,30,32}

According to the World Health Organization, a screening program should ideally meet certain criteria.³³ One criterion is that the target population finds the program acceptable.³³ To date, research has not examined issues related to acceptability, including consent, for alcohol and drug screening. The purpose of this study was to examine (1) the conditions under which postpartum women in an urban centre would consent to alcohol and drug screening of their infant, (2) whether self-reported prenatal alcohol use affected willingness to consent, and (3) the characteristics of women who would consent.

MATERIALS AND METHODS

Focus groups were convened to obtain insight into women's opinions and beliefs about newborn alcohol and drug screening, and to develop relevant hypotheses. Themes from these groups were categorized according to the Health Belief Model (HBM), which was developed to help understand the acceptance of health promotion and screening strategies.^{34,35} The questionnaire was developed

around the HBM elements of perceived susceptibility, severity, threat, benefits, and barriers. Questionnaire wording was kept as similar as possible to that used by focus group participants. The questionnaire presented several scenarios with different consequences for a positive drug or alcohol screen, and asked women to indicate their agreement with screening on a 5-point Likert scale (i.e., strongly agree to strongly disagree). Questions about demographic variables, perinatal variables, and alcohol use during pregnancy were included, as was the T-ACE, a standardized alcohol use screening questionnaire.³⁶ The questionnaire was pilot tested with 40 postpartum women and revised to resolve unclear wording. On the basis of feedback from these women, questions related to a subject's prenatal street drug use were dropped from the questionnaire.

The 20-minute questionnaire was administered by trained research assistants to all eligible, consenting women admitted to a postpartum unit in the Calgary Health Region (CHR) over a four-month period (July 2003–October 2003). Women were identified from postpartum unit admission logs and approached regarding participation in the survey. Exclusion criteria were age under 18; having a language barrier; being discharged prior to being approached to participate; presence of serious maternal or neonatal complications; being in protective custody; or apprehension of the infant. Written informed consent was obtained for the anonymous questionnaires. The study received ethical approval from the Conjoint Medical Bioethics Committee of the University of Calgary and Calgary Health Region.

Data were entered and analyzed in SPSS for Windows 14.0 (SPSS Inc., Chicago IL). Univariate descriptive statistics were used to describe participants. Bivariate analysis (chi-square tests for categorical variables and Student *t* test for continuous variables) was used to analyze willingness to consent by self-reported alcohol use, demographic and lifestyle characteristics. All tests were two-sided, and an alpha level of 0.05 or less was considered statistically significant. A logistic regression model was created using forward selection method to describe the independent characteristics of women who would consent compared with those who would not consent. Confounding and interaction variables were evaluated. Variables were entered into the model building process in the following order: lifestyle, information women would need, likely outcome of a screening program, and demographic predictors. Adjusted odds ratios and 95% confidence intervals were calculated.

We hypothesized that there would be differences in willingness to consent based on self-reported alcohol use. Using an estimate of a difference in willingness to consent of 15% between those who report alcohol use and those who do

Table 1. Participant self-reported lifestyle including tobacco and alcohol use

	In the 12 months prior to this pregnancy n (%)	During this pregnancy n (%)
Substance use among all women (n = 1450)		
Smoked cigarettes	396 (27.3)	191 (13.2)
Smoked >10 cigarettes per day, among women who smoked	184 (46.6)	45 (23.6)
Drank alcohol	1153 (79.5)	634 (44.5)*
Reported drinking alcohol during pregnancy	n/a	343 (23.7)
Reported drinking alcohol before knowledge of pregnancy	n/a	558 (39.2)
Did not report drinking during pregnancy but reported drinking before knowledge of pregnancy	n/a	289 (20.3)
Type of alcohol		
Wine	658 (45.4)	332 (52.5)†
Beer	404 (27.9)	180 (28.5)†
Mixed drinks/ cocktails	290 (20.0)	104 (16.5)†
Coolers	227 (15.7)	81 (12.8)†
Liquor	204 (14.1)	58 (9.2)†
Drank 5 or more drinks on one occasion	578 (39.9)	
T-ACE ≥ 2		540 (37.2)
Substance use among women who drank during pregnancy (n = 634)		
Trimester of alcohol use		
Any 1st trimester use		572 (90.5)
Any 2nd trimester use		91 (14.4)
Any 3rd trimester use		118 (18.7)
All 3 trimesters		46 (7.3)

*With or without knowledge of the pregnancy

†Among women who reported drinking alcohol during pregnancy

Note: Frequencies may vary due to missing cases.

not, the sample size was calculated at 134 per group with a 2-sided alpha of 0.05 to have 80% power. The sample size was designed to be large enough to allow for stratified analysis and to control for potentially confounding factors.

RESULTS

The survey was administered to 1509 women (78.4% of those eligible) on postpartum units in Calgary, an urban region of approximately one million people.³⁷ Of the 3253 women admitted to the postpartum units during the data collection period, 1920 were eligible to participate, representing approximately 13% of the 14 473 live births for 2003 in the CHR. Reasons for ineligibility included early discharge, or admission to unit and subsequent discharge between 4:30 pm and 8:00 am on the following morning (41.6%), having a language barrier (26.9%), medical/neonatal complications (17.7%), being antepartum (12.6%), and being under age (1.3%). Of the 1509 women who agreed to participate, 1474 (97.7%) completed the entire

questionnaire. Subject fatigue was the main reason identified for not completing the questionnaire. Some subjects elected to not respond to certain questions, so the denominator for analysis varied between 1432 and 1474.

Approximately one half of the women were 30 years of age or over (54.2%), with the largest proportions of women in the study being between 30 and 34 (34.1%) and between 25 and 29 (27.9%) years of age. Approximately 93% of women were married or in a common law relationship and almost one half of the women (47.1%) were primiparous. Forty percent of women had a university degree, and 25.2% had a high school diploma or lower. A majority of women reported some alcohol use (79.5%) in the 12 months prior to pregnancy, with approximately one half of these women reporting a binge episode of five or more drinks on one occasion (Table 1). Approximately one quarter (27.3%) of women reported smoking cigarettes prior to pregnancy, and one half of these women (13.2%) continued to smoke during pregnancy (Table 1). In general, women reported

Table 2. Women who strongly agreed or agreed to screening for their babies, types of information that women would need to know in order to agree to screening, and the likely impact of routine screening based on alcohol self-report during pregnancy

	All Women	Report of alcohol use during pregnancy among drinkers*		<i>P</i>
	n = 1460 n (%)	Yes (n = 634) n (%)	No (n = 792) n (%)	
Support universal screening in which women can refuse screening†	843 (57.7)	331 (52.2)	473 (59.7)	0.004
Support universal screening of all babies (no special consent)‡	1002 (68.6)	504 (79.5)	551 (69.6)	< 0.001
You would consent to the screening of your baby§	1369 (93.8)	579 (91.3)	729 (92.0)	0.62
In order to consent you to screening you would need to know the following				
How much drugs or alcohol make a test positive	772 (52.3)	310 (48.9)	431 (54.4)	0.04
What happens with a positive test result	1431 (97.1)	610 (96.2)	756 (95.5)	0.48
Who has access to the information	1377 (93.4)	579 (91.3)	735 (92.8)	0.30
How effective medical care is for children who test positive	1435 (97.4)	604 (95.3)	766 (96.7)	0.16
The chance that a baby will have a problem if a test is positive	1444 (98.1)	608 (95.9)	772 (97.5)	0.09
If all babies were routinely tested then following may be the result				
Women will cut back on drug and alcohol use during pregnancy if their baby will be tested	972 (66.2)	440 (71.2)	493 (63.1)	0.001
There will be a decrease in the number of children born exposed to drugs and alcohol	934 (63.7)	418 (67.6)	477 (61.2)	0.012
Babies will get the help they need early in life	1392 (95.0)	598 (96.6)	733 (94.1)	0.03
If all women are tested no one will feel like they are being discriminated against	1280 (87.3)	552 (89.6)	666 (85.3)	0.02
Women will have babies at home to avoid drug and alcohol screening	403 (27.5)	164 (26.5)	218 (27.9)	0.59
Women will be less likely to seek prenatal care	652 (44.4)	275 (44.5)	344 (44.0)	0.87
Women will be less likely to trust their health care providers	484 (33.1)	201 (32.5)	258 (33.0)	0.84

*Among those women who did not identify themselves as non-drinkers.

†You would support universal screening of babies for drug and alcohol exposure in which women are allowed to refuse screening of their infant.

‡You would support universal screening of all babies as part of routine care (i.e., women do not provide special consent).

§If universal screening for drug and alcohol exposure was performed in Alberta you would consent to the screening of your baby.

Note: Frequencies may vary because of missing cases.

that care providers asked them about substance use during pregnancy (83.5%); 64.2% of physicians who discussed alcohol use recommended “none is best.” Some care providers (7.9%) gave advice related to alcohol use that was not in keeping with the current guidelines of “no alcohol is best.”¹⁻⁴ Approximately 10% of women believed that some alcohol use during pregnancy was appropriate. Only 38.9% of participants felt that women were aware of the potential problems for children exposed to alcohol use during

pregnancy, and there was limited interest in additional information about alcohol (7.2%) and smoking (6.5%).

Women who reported alcohol use during pregnancy were significantly ($P < 0.05$) more likely to support universal screening of all babies (Table 2). Almost all participants would consent to screening of their own infant (93.8%) and agreed that a woman should consent to screening if the consequence of a positive screen meant that the woman stayed with her infant and both received help (97.6%) (Table 3). Those who reported alcohol use were more likely to agree

that the physician should be able to screen without consent for all scenarios except for “mother and baby stay together and neither receive extra help.”

Women who would not consent to screening of their infant were more likely to be 30 years of age or older, married, primiparous, and well educated and were less likely to report alcohol and tobacco use. (Table 4). In the multivariate model, women who would consent were more likely to be multiparous and to have lifestyle risk factors that put them at risk of an alcohol exposed pregnancy (Table 5). Those who would consent believed that if women were screened, they would take action to reduce consumption, and the number of alcohol exposed pregnancies would be reduced (Table 5).

DISCUSSION

This survey of 1509 recently delivered women in an urban setting achieved a high participation rate of 78.4%. Those who took part were similar to all women giving birth in this health region in terms of age, income, ethnicity, parity, and education.³⁷ Consequently the findings are likely generalizable to similar urban centres in developed countries but may not be generalizable to rural populations.

The majority of women supported universal screening for alcohol and drug exposure as part of routine care, and almost all would consent to the screening of their own infant. This level of acceptance is comparable to prenatal HIV screening programs and newborn metabolic screening, which achieve participation rates approaching 100% using universal opt-out methods and which have effective treatments for newborns.³⁸ In the case of HIV, there has been a decrease in the stigma associated with identification of at-risk infants and an increase in the acceptance of testing. Furthermore, a dramatic increase in the effectiveness of treatment has led the Centres for Disease Control to call for routine universal screening for HIV of all patients, including pregnant women, using opt-out methods with no separate consent required.^{39,40}

The high level of support for alcohol and drug screening may be related to the perceived benefit of screening and early detection for the mother and child. This is suggested by the finding that almost all women agreed that screening was appropriate if effective intervention was provided for mother and child, but less than 20% agreed if no intervention was provided. There is some evidence for the effectiveness of brief prenatal interventions to decrease or eliminate alcohol use during pregnancy, but without regular follow-up and reinforcement, long-term reduction may not be achieved.^{41–43} Participants also indicated that in order to consent to screening of their infant, they would need to know how results would be used, the chances that a baby

Table 3. Frequency and percentage of women who strongly agreed or agreed with scenarios

	Doctor should be able to test without consent* n (%)	Jane should consent to screening† n (%)
Baby placed into care and Jane receives help‡	964 (64.6)	1191 (80.5)
Jane and baby stay together and receive help§	1213 (81.3)	1440 (97.6)
Jane and baby stay together but don't receive help	167 (11.2)	271 (18.4)
Jane and baby stay together but only Jane receives help¶	171 (11.5)	371 (25.2)

*Doctor should be able to test Jane's baby without asking for her consent if the consequence of a positive test may be that:

†Jane should consent to the screening of her baby if the consequence of a positive test may be that:

‡Her baby will be temporarily placed in care while Jane is assessed for drug and alcohol problems and receives help.

§Jane and her baby will stay together and they both receive the help that they need.

||Jane and her baby stay together but neither receives any assessment or extra help.

¶Jane and her baby will stay together while only Jane receives the help that she needs. Jane's baby receives no extra help.

with a positive result would have a problem, and how effective care was for those who screen positive. Early diagnosis allows for earlier access to resources, additional educational funding, and improved understanding on the part of parents of their child's behaviour, and potentially leads to better outcomes for children and a reduced likelihood of secondary disabilities.^{44,45} However, there is limited evidence to indicate that population-based infant screening identifies those most at risk of disability and, hence, those most in need of appropriate and effective support; or that any interventions associated with screening modalities lead to difference in functional outcome.⁴⁶ Without this evidence, women indicated that they would not consent to screening.

Although participants did not indicate a need for additional information about substance use during pregnancy, the majority believed that women were unaware of the potential associated health problems. This finding is difficult to interpret but may suggest a need for strategies to inform women early on about the effect of substance use on pregnancy outcomes. While information and increased knowledge among women is important, additional research is required to

Table 4. Differences between women who would or would not consent to screening of their infant

Group	Would consent (n = 1369), n (%)	Would not consent (n = 63), n (%)	P
Demographics			
≥ 30 years of age	726 (53.3)	43 (71.7)	0.005
Married	1075 (79.0)	56 (91.8)	0.01
Primiparous	635 (46.8)	37 (60.7)	0.03
Education			
≥ University undergraduate degree	530 (38.9)	38 (62.3)	< 0.001
≤ High school graduation	355 (26.1)	4 (6.6)	< 0.001
Lifestyle			
Smoked in 12 months prior to pregnancy	383 (28.1)	6 (9.8)	0.002
Smoked during pregnancy	186 (13.7)	3 (4.9)	0.05
Drank alcohol in 12 months prior to pregnancy	1090 (80.1)	42 (68.9)	0.03
Binge drinking in 12 months prior to pregnancy	558 (51.3)	15 (36.6)	0.007
Alcoholic drinks consumed in a typical week	1.63 (SD 3.79)	1.53 (SD 3.29)	0.87
Did not drink alcohol during pregnancy	790 (57.7)	38 (58.7)	0.90
T-ACE ≥ 2	528 (38.6)	11 (17.5)	< 0.001
Number of risk drinking factors (positive T-ACE, alcohol use in pregnancy, binge episode)			
0	323 (23.6)	24 (38.1)	
1	536 (39.2)	26 (41.3)	0.008
2	401 (29.3)	13 (20.6)	
3	109 (8.0)	0 (0.0)	
Type of alcohol consumed			
Liquor	200 (18.3)	2 (4.8)	0.02
Opinions related to the result of routine screening			
Women will cut back on drug and alcohol use during pregnancy if their baby will be tested	938 (68.5)	20 (31.7)	< 0.001
There will be a decrease in the number of children born exposed to drugs and alcohol	901 (65.8)	19 (30.2)	< 0.001
Babies will get the help they need early in life	1305 (95.4)	56 (88.9)	< 0.001
If all women are tested no one will feel like they are being discriminated against	1225 (89.5)	30 (47.6)	< 0.001
You would support universal screening of all babies as part of routine care	1087 (79.4)	9 (14.3)	< 0.001
In order to consent a woman would need to know			
How much drugs or alcohol make a test positive	705 (51.5)	43 (68.3)	0.03

Note: Frequencies may vary because of missing cases.

identify effective means of changing illicit substance use during pregnancy.

A majority of women (81.3%) agreed that physicians should be able to screen in the absence of consent when both the mother and child will receive help. A recent survey of 847 obstetricians, pediatricians, and family practice physicians found that 61% to 75% agreed with mandatory screening for alcohol abuse, 43% to 55% agreed with mandatory screening for illicit drugs, and 52% favoured legislation that would make alcohol and drug use in pregnancy “child abuse” and grounds for removal to protective custody.⁴⁷ Physician attitudes related to screening subjects without consent and the potential for child apprehension may harm

the physician-patient relationship and create barriers to screening.

The risk of child apprehension was not a critical barrier to screening for women in this study because 80% supported screening if the infant were to be placed in care and the mother would receive help. Approximately 17% of women did not agree with screening in this scenario but did agree with screening if both mother and infant would receive help. This suggests that there is a group of women who may view child apprehension as a barrier to screening. Of note, some child protection agencies in the US apply newborn screen results to make decisions related to child apprehension. A recent survey of 200 US state and county child

Table 5. Adjusted odds ratios for characteristics of women who would consent versus those who would not consent to drug and alcohol screening of their newborn

Characteristic	Would consent (n = 1369), n (%)	Would not consent (n = 63), n (%)	AOR (95% CI)
Demographics			
Multiparous	723 (53.2)	24 (39.3)	2.14 (1.20–3.80)
Lifestyle			
Smoked cigarettes prior to pregnancy	383 (28.1)	6 (9.8)	2.70 (1.09–6.73)
T-ACE Positive (≥ 2)	528 (38.6)	11 (17.5)	2.24 (1.11–4.51)
Binge drinking prior to pregnancy recognition	558 (40.8)	15 (23.8)	1.90 (0.99–3.60)
Information during pregnancy			
Would have like additional information on alcohol use during pregnancy	101 (7.6)	1 (1.6)	6.02 (0.76–47.55)
Received information on prenatal alcohol use from partner	725 (53.3)	22 (36.1)	2.00 (1.11–3.59)
The likely outcome of a screening program is that:			
Women will cut back on drug & alcohol use	938 (68.6)	20 (31.8)	2.15 (1.07–4.31)
No one will feel like they are being discriminated against if all women are tested	1225 (89.5)	30 (48.4)	5.94 (3.34–10.57)
There will be a decrease in the number of children born exposed to drugs and alcohol	901 (65.9)	19 (30.2)	2.10 (1.06–4.18)

CI: confidence interval

AOR: Adjusted odds ratios are adjusted for all other characteristics in the table.

Note: Frequencies may vary because of missing cases.

protection services found tremendous variation in neonatal screening programs.⁴⁷ Some counties press criminal charges for positive screen results for cocaine, amphetamine/opiate, and cannabis, and women may choose to deliver in a neighbouring county to avoid screening or legal action.⁴⁸

A majority of women reported that their physician spoke to them about alcohol, drug, and tobacco use during pregnancy, with almost two thirds of physicians recommending that no alcohol be consumed while pregnant. This is consistent with findings from a national survey of Canadian physicians on fetal alcohol syndrome prevention and diagnosis.⁴⁹ Some women in this study reported that their physicians told them that occasional or moderate alcohol use is fine, which is contrary to current guidelines.^{1–4} The number of women surveyed who believed that some alcohol use during pregnancy is safe (10%) is comparable to the proportion of physicians who tell their patients that some alcohol use is acceptable (9%). These factors may lead to a decreased perception of the threat and susceptibility to deficit associated with prenatal alcohol exposure. Indeed, this survey identified that 44.5% of women used some alcohol during pregnancy. Of note, approximately one half of the women who drank during pregnancy did not identify alcohol use prior to pregnancy recognition as “drinking during pregnancy,” suggesting that there is variability in understanding of drinking

during pregnancy. The rates of smoking prior to pregnancy and of successful smoking cessation are consistent with reported rates in Canada.⁶

Self-reported alcohol use during pregnancy did not influence women’s willingness to consent to screening of their own infant in this study. However, women who reported alcohol use during pregnancy were more likely to support infant screening in virtually all questions and scenarios and were less likely to agree that it was a woman’s right to refuse screening. They were also more likely to believe that a screening program would lead to less alcohol and drug use during pregnancy and would reduce the prevalence of FASD. Women who reported a history of alcohol use may have been more supportive of screening than women without such a history because of the perceived benefits of screening. However, the relationship between self-reported use of alcohol and willingness to consent may be confounded by inaccurate reporting amongst women who denied alcohol use during pregnancy.

Women who would not consent to infant screening were older, more educated, less likely to report alcohol use, less likely to smoke, less likely to believe that women would not feel discriminated against if all infants were screened, and less likely to think that there would be benefits associated

with a screening program. In general, these women were professionals who may have seen screening as an invasion or violation of their privacy or rights. The perceived lack of benefit may have been compounded by a perceived lack of susceptibility for those who did not report alcohol use. For older mothers, it is important to be aware that these women may have established alcohol use patterns that are harder to change during pregnancy, and the effect of alcohol on fetal development is greater with advanced maternal age.^{16,50}

The data collection strategy attempted to capture all women giving birth in urban hospitals. However, the sample did not capture women who were discharged early, who developed complications, who were in protective custody, or whose children were being apprehended. Thus, some women at higher risk of substance use during pregnancy were likely not surveyed. The questionnaire was designed to capture women's opinions at a time when they would potentially provide consent for newborn screening. Although women who consumed alcohol during pregnancy may have been less likely to participate, the rates of alcohol use during pregnancy were similar to those reported elsewhere,^{5-7, 51} suggesting reasonable target population representation.

Further research is required to understand the potential effectiveness of screening programs and early interventions for mother and child, because this will be crucial in order for women to participate. Without evidence of effective intervention for children identified as being at risk, neonatal drug and alcohol screening cannot be recommended. These should not be stand-alone tools used at birth, but rather should be part of an overall program of integrated pre-pregnancy, prenatal, postnatal, and early childhood strategies.

CONCLUSION

Women would support a universal screening program for substance use during pregnancy if screening made a difference for the mother and baby and appropriate resources were allocated to support optimal child development. At present there is very limited evidence of the effectiveness of specific screening programs for prenatal drug or alcohol exposure, or of treatment programs for children currently identified by targeted or universal screening methods. Women indicated that universal screening decreases discrimination associated with selective screening. Women who were identified as being at risk of having an alcohol exposed pregnancy (by a positive T-ACE score or binge drinking prior to pregnancy) would support universal screening, whereas more highly educated older women were less likely to support universal screening. Women most likely to benefit from early identification of drinking during pregnancy would engage in a screening program.

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