

# Screening, Brief Intervention, and Referral to Treatment for Prenatal Alcohol Use and Cigarette Smoking: A Survey of Academic and Community Health Care Providers

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**Objectives:** Prenatal alcohol and cigarette smoking are associated with numerous adverse pregnancy outcomes. Screening, Brief Intervention, and Referral to Treatment (SBIRT) represents a standardized approach; however, implementation in routine pregnancy care remains a challenge. The purpose of the study was to determine

current practices, barriers to implementation, and education needs of healthcare providers utilizing SBIRT to address prenatal alcohol and cigarette smoking.

**Methods:** We conducted a survey of 118 providers including family physicians, midwives, and obstetricians practicing at 2 Toronto hospitals: community-based teaching site and fully affiliated academic health sciences center.

**Results:** The response rate was 79%. Almost all providers reported screening every pregnant woman for alcohol and smoking status. Brief intervention was offered by fewer providers. Education and supportive counseling were reported by a higher percentage of providers for prenatal cigarette smoking in comparison to alcohol use. Furthermore, up to 60% referred pregnant women to treatment programs for alcohol and cigarette smoking. A significantly higher number of community-based providers reported referring pregnant women to addiction treatment programs. Barriers to interventions included a perceived lack of appropriate resources, training, and clinical pathways.

**Conclusion:** Healthcare providers report universal screening for prenatal alcohol and cigarette smoking; however, brief intervention and referral to treatment are more limited practices. There is a need for education of all providers regarding effective brief counseling strategies and referral to appropriate treatment resources. Development of clinical care pathways may also increase adoption of all components of SBIRT for prenatal alcohol use and cigarette smoking.

**Key Words:** alcohol, counseling, pregnancy, screening, tobacco smoking

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**P**renatal alcohol and cigarette smoking are associated with numerous adverse pregnancy outcomes including an increased risk of miscarriage, physical violence, comorbid psychiatric illness, preterm labor, intrauterine growth restriction, congenital birth defects, and developmental problems (Public Health Agency of Canada, 2009; Carson et al., 2017; Ordean et al., 2017). Despite public awareness of these risks, national surveys have shown that 12% of women smoked and 11% consumed alcohol during pregnancy (Public Health Agency of Canada, 2009; Statistics Canada, 2013). Concurrent drinking and cigarette smoking during pregnancy has also been reported; women who drink are more likely to smoke and smokers are more likely to drink leading to a clustering of risks among pregnant women (Kesmodel et al., 2003; Aliyu

et al., 2009; Powers et al., 2013; Passey et al., 2014). The prevalence of alcohol use and cigarette smoking usually decreases once women are aware of pregnancy and >50% of pregnant women report a temporary abstinence during pregnancy (Public Health Agency of Canada, 2009). However, a significant proportion of pregnancies continue to be substance-exposed resulting in preventable fetal and obstetrical risks.

A comprehensive and standardized approach to identification and management of substance use in numerous settings including primary care and obstetrics and gynecology is Screening, Brief Intervention, and Referral to Treatment (SBIRT) (Ries, 2014). SBIRT has been promoted as an approach for individuals along the substance use continuum. Brief interventions (BIs) refer to short counseling sessions (up to 20 minutes) provided as part of routine clinical care. Multiple sessions, and also an established relationship have been shown to be more effective than single sessions by unfamiliar providers (Stade et al., 2009; Ries, 2014). Referral to treatment could consist of referral to health professionals like social workers who are trained to assess and advise about substance use, and also community programs such as addiction treatment programs and telephone helplines. Systematic reviews and meta-analyses have found moderate strength evidence for SBI in the general population (Ries, 2014). Cochrane reviews on counseling interventions for alcohol and cigarette smoking during pregnancy demonstrated the effectiveness of BI in terms of increasing abstinence, and reducing antenatal alcohol use and cigarette smoking with improved obstetrical outcomes (Stade et al., 2009; Chamberlain et al., 2017). Based on this evidence, national and international organizations recommend SBIRT for alcohol and cigarette smoking for pregnant women (Ries, 2014; World Health Organization, 2014; Ordean et al., 2017).

Adoption of SBIRT by healthcare providers has not been universal. A review of the literature on SBIRT for prenatal alcohol and cigarette smoking use revealed that up to 95% of providers screen for smoking and alcohol status during pregnancy with a smaller proportion following up at a future visit (Batty and King, 1990; Oncken et al., 2000; Grimley et al., 2001; Glover et al., 2008; Bailey and Jones Cole, 2009; Coleman-Cowager et al., 2014; Carson et al., 2017). The most frequent intervention offered is advice to women for alcohol or smoking abstinence and/or reduction (Batty and King, 1990; Oncken et al., 2000; Grimley et al., 2001; Tough et al., 2005; Lefebvre et al., 2007; Glover et al., 2008; Bailey and Jones Cole, 2009; Coleman-Cowager et al., 2014; Carson et al., 2017). Cessation counseling and referral to treatment programs was only offered by a small minority of providers. Despite almost universal screening in clinical practice, gaps remain in the provision of BIs and referral to treatment.

Past studies have documented reasons for not implementing BIs including a lack of adequate skills and training, time limitations, expected denial or resistance from women, and lack of resources specific to pregnant women (Okoli et al., 2010; World Health Organization, 2014; Carson et al., 2017; Ordean et al., 2017). It is also possible that a lack of an integrated approach to alcohol and tobacco screening with clear pathways to assist women represents a

systemic barrier to providing these interventions during prenatal visits.

The goal of this study is to determine implementation of all components of SBIRT by a spectrum of healthcare providers with respect to alcohol and cigarette smoking during pregnancy. Furthermore, barriers to each component of care will be identified. Findings from this study will be used to guide further knowledge translation efforts such as education and clinical practice strategies to engage providers in various elements of SBIRT with the ultimate goal of changing clinical practice and reducing substance exposed pregnancies.

## METHODS

We conducted a survey of healthcare providers consisting of family physicians (practising antenatal and intrapartum care), midwives, and obstetricians. Practitioners with privileges at 1 of 2 Toronto hospitals were included: a community-based hospital and an academic fully-affiliated health center. Both sites are training centers for the Department of Family and Community Medicine and the Department of Obstetrics and Gynecology at the University of Toronto and therefore, provide privileges to a continuum of healthcare providers. The community-based teaching hospital (CTH) provides comprehensive obstetrical services with a level II neonatal intensive care unit (NICU) with a capacity for up to 4000 deliveries annually. The fully affiliated academic health sciences center (AHSC) located in downtown Toronto has a special pregnancy program with a level III NICU and has up to 6500 deliveries annually. Thus, the tertiary care hospital was chosen based on its reputation of providing gold standard of care for obstetrical patients. This study received approval from the Research Ethics Boards at both hospitals.

For a confidence level of 95% and confidence interval of 5%, we required a sample size of 86. The anonymous questionnaire was mailed to all 118 eligible practitioners at baseline followed by a reminder letter at 1 week, 2 weeks thereafter, and again at 4 weeks after the second reminder, if the provider did not respond.

The questionnaire asked demographic information, current screening, and management practices with respect to alcohol and cigarette smoking during pregnancy, barriers to each element of care, and interest in further medical education. The focus of this survey was on cigarette smoking because almost all tobacco exposure for this population consists of smoked tobacco. Therefore, responses related to smoking referred specifically to tobacco smoke and not to other substances.

Demographics and response frequencies to practice questions were summarized using descriptive analysis for each site. Differences between sites were analyzed using Fisher *t* test with SPSS software package. A *P* value of 0.05 or less was considered a statistically significant difference.

## RESULTS

The survey was distributed to 118 practitioners. Five practitioners responded that they were on leave or no longer providing obstetrical services, and therefore, were excluded from the study. Overall, we received 89 valid responses out of a possible 113 practitioners equalling a response rate of 79%.

## Demographics

Characteristics of respondents are summarized in Table 1. The population was equally divided between midwives (34.8%), family physicians (31.5%), and obstetricians (33.7%). There were significantly more female providers at the CTH (89.7%) in comparison to the AHSC (70.0%). About 70% of providers at each site had practices within their respective hospital and 20% were in a community office. Significantly more providers at AHSC identified working in a teaching unit. With respect to years in practice, 40% of this cohort reported being in practice for <10 years followed by 30% for 10 to 20 years. There was no significant difference in the number of pregnant women seen per week between the sites and among providers.

## Screening for Alcohol and Cigarette Smoking During Pregnancy

Almost all providers perform universal screening themselves by asking all pregnant women about risk behaviors during the first trimester. Approximately 30% of respondents also indicated that screening may be performed by a nurse and 17% by a receptionist. There were no significant differences in screening practices between the 2 sites. The use of validated screening tools was not reported by any providers. However, documentation of screening varied between the 2 sites. Results indicated that there was a significant difference in recording practices with statistically more providers at CTH (67%) compared with AHSC (38%) ( $P = 0.010$ ) noting information in the patient's chart. A similar number of providers at both sites (89%) also documented screening in the Ontario Perinatal Record (OPR). The OPR is a standardized form which incorporates best practice clinical guidelines and includes the entire prenatal history (Provincial Council for Maternal and Child Health and The Better Outcomes Registry

and Network Ontario Perinatal Record Working Group, 2018). This record is intended to facilitate communication of important clinical documentation and to reach the birthing hospital for delivery.

## Brief Intervention and Referral to Treatment for Alcohol Use

Brief interventions consisted of education and supportive counseling. Most participants reported that they provided verbal education about the possible risks of maternal use of alcohol with a smaller number providing written information (Table 2). Overall, up to 80% provided general advice and only half provided case-specific advice. Approximately 67% advised abstinence and 52% advised reduction in alcohol use among pregnant women. Less than 50% referred pregnant women for further treatment or to other resources (Table 2). A significantly higher number of providers at CTH reported referring pregnant women to addiction treatment programs.

## Brief Intervention and Referral to Treatment for Cigarette Smoking

Education about antenatal cigarette smoking was reported by a higher percentage of providers in comparison to antenatal alcohol use. Almost all health professionals provide verbal education about risks with 25% also handing out a brochure and 36% directing women to other sources of information (Table 3). Over 80% provided general advice and ~70% advised smoking cessation or reduction in smoking. A significantly higher number of providers at CTH advised reduced smoking during pregnancy in comparison to those at AHSC. Pharmacotherapy for smoking cessation was not a common part of practice with only 25% discussing use of nicotine replacement treatment (NRT) with pregnant women (Table 3). Less than 50% referred pregnant women for further

**TABLE 1.** Demographics

Variable	CTH (n = 39)	AHSC (n = 50)	Total (N = 89)	P
Mean age	43 (8.7)	48 (12.8)	46 (11.4)	0.073
Sex: female	35 (89.7%)	35 (70.0%)	70 (78.7%)	0.036*
Year of graduation	2003 (9.2)	1998 (13.0)	2000 (11.6)	0.093
Profession				0.303
Family physicians	11 (28.2%)	17 (34.0%)	28 (31.5%)	
Midwives	17 (43.6%)	14 (28.0%)	31 (34.8%)	
Obstetricians	11 (28.2%)	19 (38.0%)	30 (33.7%)	
Practice setting				
Tertiary care hospital	1 (2.6%)	37 (74.0%)	38 (42.7%)	<0.001 <sup>†</sup>
Community hospital	28 (71.8%)	0	28 (31.5%)	<0.001 <sup>†</sup>
Teaching unit	9 (23.1%)	24 (48.0%)	33 (37.1%)	0.026*
Community office	9 (23.1%)	10 (20.0%)	19 (21.3%)	0.797
Solo practice	5 (12.8%)	2 (4.0%)	7 (7.9%)	0.233
Group practice	26 (66.7%)	24 (48.0%)	50 (56.2%)	0.089
Years in practice, yrs				0.056
<10	19 (48.7%)	17 (34.0%)	36 (40.4%)	
10–20	11 (28.2%)	14 (28.0%)	25 (28.1%)	
21–30	8 (20.5%)	8 (16.0%)	16 (18.0%)	
>30	1 (2.6%)	11 (22.0%)	12 (13.5%)	

Data presented as mean (SD) or n (%).

AHSC, Academic Health Sciences Center; CTH, Community-based Teaching Hospital.

\* $P < 0.05$ .

<sup>†</sup> $P < 0.001$ .

**TABLE 2.** Brief Intervention and Referral to Treatment for Prenatal Alcohol Use

Practice	CTH (n = 39)	AHSC (n = 50)	Total (N = 89)	P
Education				
Verbal education	34 (87.2%)	48 (96.0%)	82 (92.1%)	0.233
Brochure	7 (17.9%)	5 (10.0%)	12 (13.5%)	0.353
Direct to website/articles	10 (25.6%)	12 (24.0%)	22 (24.7%)	1.000
Supportive counseling				
General advice	30 (76.9%)	39 (78.0%)	69 (77.5%)	1.000
Case specific advice	17 (43.6%)	20 (40.0%)	37 (41.6%)	0.829
Advise abstinence	25 (64.1%)	35 (70.0%)	60 (67.4%)	0.650
Advise reduced use	25 (64.1%)	21 (42.0%)	46 (51.7%)	0.054
Referral to treatment				
Brief counseling	14 (35.9%)	18 (36.0%)	32 (36.0%)	1.000
Referral to other resources	19 (48.7%)	24 (48.0%)	43 (48.3%)	1.000
Referral to addiction treatment	19 (48.7%)	14 (28.0%)	33 (37.1%)	0.050*
Referral to social work	14 (35.9%)	19 (38.0%)	33 (37.1%)	1.000

Data presented as n (%).

AHSC, Academic Health Sciences Center; CTH, Community-based Teaching Hospital.

\*P &lt; 0.05.

treatment. Significantly more providers at CTH referred women to addiction treatment programs for smoking cessation counseling.

### Barriers to SBIRT

Providers were asked to identify barriers to each component of SBIRT (Table 4). About 20% of respondents indicated that they did not perceive any barriers to any component of care. With respect to screening, the most commonly cited barriers included lack of resources (31%), expected patient denial (12%), and time limitations (11%). For BIs, respondents indicated lack of resources (52%) followed by time limitations (37%), lack of training (29%), and lack of clinical pathways (28%) as barriers to care. Referral to treatment was limited due to reported lack of clinical pathways (27%), lack of resources (26%), expected patient denial

(26%), and lack of training (20%). There were no significant differences in perceived barriers between the 2 sites.

### Continuing Education of Maternity Care Providers

Providers were asked to indicate their interest in receiving further medical education (Table 5). Over 90% of respondents indicated an interest in continuing medical education about alcohol and cigarette smoking during pregnancy. Specifically, providers were very interested in learning more about treatment options for pregnant persons who use alcohol or smoke (66%), counseling strategies (60%), smoking cessation during pregnancy (55%), diagnosis and treatment of withdrawal (43%), and also social and psychiatric problems of pregnant persons (43%). There were no differences found between the 2 sites.

**TABLE 3.** Brief intervention and Referral to Treatment for Prenatal Cigarette Smoking

Practice	CTH (n = 39)	AHSC (n = 50)	Total (N = 89)	P
Education				
Verbal education	39 (100.0%)	49 (98.0%)	88 (98.9%)	1.000
Brochure	11 (28.2%)	10 (20.0%)	21 (23.6%)	0.453
Direct to website/articles	17 (43.6%)	15 (30.0%)	32 (36.0%)	0.266
Supportive counseling				
General advice	32 (82.1%)	42 (84.0%)	74 (83.1%)	1.000
Case specific advice	19 (48.7%)	23 (46.0%)	42 (47.2%)	0.833
Advise abstinence	29 (74.4%)	32 (64.0%)	61 (68.5%)	0.361
Advise reduced use	33 (84.6%)	31 (62.0%)	64 (71.9%)	0.031*
Pharmacotherapy				
NRT	10 (25.6%)	12 (24.0%)	22 (24.7%)	1.000
Bupropion	1 (2.6%)	0	1 (1.1%)	0.438
Other	0	1 (2.0%)	1 (1.1%)	1.000
Referral to treatment				
Brief counseling	20 (51.3%)	19 (38.0%)	39 (43.8%)	0.282
Referral to other resources	25 (64.1%)	26 (52.0%)	51 (57.3%)	0.276
Referral to addiction treatment	17 (43.6%)	10 (20.0%)	27 (30.3%)	0.021*
Referral to social work	12 (30.8%)	16 (32.0%)	28 (31.5%)	1.000

Data presented as n (%).

AHSC, Academic Health Sciences Center; CTH, Community-based Teaching Hospital.

\*P &lt; 0.05.



**TABLE 4.** Barriers to Screening, Brief Intervention, and Referral to Treatment

Barrier/Site	CTH (n = 39)	AHSC (n = 50)	Total (N = 89)	P
None or n/a	8 (20.5%)	10 (20.0%)	18 (20.2%)	1.000
Lack of training				
Screening	2 (5.1%)	2 (4.0%)	4 (4.5%)	1.000
Brief intervention	10 (25.6%)	16 (32.0%)	26 (29.2%)	0.625
Referral to treatment	6 (15.4%)	12 (24.0%)	18 (20.2%)	0.427
Lack of knowledge				
Screening	2 (5.1%)	1 (2.0%)	3 (3.4%)	0.579
Brief intervention	4 (10.3%)	4 (8.0%)	8 (9.0%)	0.726
Referral to treatment	1 (2.6%)	6 (12.0%)	7 (7.9%)	0.130
Time limitations				
Screening	4 (10.3%)	6 (12.0%)	10 (11.2%)	1.000
Brief intervention	12 (30.8%)	21 (42.0%)	33 (37.1%)	0.275
Referral to treatment	5 (12.8%)	8 (16.0%)	13 (14.6%)	0.767
Lack of interest				
Screening	0	1 (2.0%)	1 (1.1%)	1.000
Brief intervention	1 (2.6%)	4 (8.0%)	5 (5.6%)	0.380
Referral to treatment	1 (2.6%)	1 (2.0%)	2 (2.2%)	1.000
Lack of reimbursement				
Screening	2 (5.1%)	0	2 (2.2%)	0.189
Brief intervention	3 (7.7%)	2 (4.0%)	5 (5.6%)	0.650
Referral to treatment	2 (5.1%)	1 (2.0%)	3 (3.4%)	0.579
Expected patient denial				
Screening	3 (7.7%)	8 (16.0%)	11 (12.4%)	0.335
Brief intervention	6 (15.4%)	8 (16.0%)	14 (15.7%)	1.000
Referral to treatment	13 (33.3%)	10 (20.0%)	23 (25.8%)	0.222
Lack of resources				
Screening	6 (15.4%)	6 (12.0%)	12 (30.8%)	0.758
Brief intervention	14 (35.9%)	18 (36.0%)	26 (52.0%)	1.000
Referral to treatment	12 (13.5%)	32 (36.0%)	38 (25.8%)	0.054
Lack of clinical pathways				
Screening	5 (12.8%)	2 (4.0%)	7 (7.9%)	0.233
Brief intervention	11 (28.2%)	14 (28.0%)	25 (28.0%)	1.000
Referral to treatment	11 (28.2%)	13 (26.0%)	24 (27.0%)	0.815

Data presented as n (%).  
 AHSC, Academic Health Sciences Center; CTH, Community-based Teaching Hospital.

## DISCUSSION

The findings from our survey indicate that most providers screen for alcohol use and cigarette smoking in the first trimester of pregnancy; however, far fewer provide any form of BI and/or arrange referrals in response to prenatal screening. There was no difference in interventions provided for alcohol use in comparison to smoking. This group of health-care providers identified lack of knowledge about resources and time limitations as main barriers to SBIRT, but indicated a desire to learn more about effective interventions.

When comparing the academic and community sites, community-based providers reported increased rates of BIs. Almost twice as many community providers indicated referring to addiction treatment programs for both alcohol use and cigarette smoking during pregnancy in comparison to academic providers. Community providers were also more likely to advise reduction in smoking than academic providers.

The high screening rates by providers has been reported by other published studies. Tough et al. found that 94% of surveyed Canadian family physicians, midwives, and obstetricians inquired about alcohol use once women were pregnant (Tough et al., 2005). A review by Okoli et al. also reported that between 73% and 100% of healthcare providers asked pregnant women about their smoking status (Okoli et al., 2010). Similarly, the lower reported rates of BI and referral to

treatment by maternity care providers are in keeping with other studies that have also found lower rates of intervention among providers (Batty and King, 1990; Oncken et al., 2000; Grimley et al., 2001; Tough et al., 2005; Glover et al., 2008; Bailey and Jones Cole, 2009; Okoli et al., 2010; Coleman-Cowager et al., 2014). Tough et al. reported that 55% of providers were prepared to care for pregnant women with alcohol use and 70% were prepared to access resources (Tough et al., 2005). Okoli et al. (2010) also documented that less than 50% of healthcare providers were assisting with smoking cessation or arranging follow-up and referrals for pregnant women.

This discrepancy in uptake of the different components of SBIRT is a concerning finding and may be explained by reported barriers to SBIRT. The majority of maternity care providers seem to be aware of the rationale and significance of screening as shown by the high screening rates and low rates of self-reported gaps in knowledge or training with respect to identification of substance use in pregnancy. However, up to 50% of maternity care providers identified external factors such as suspected patient denial, lack of resources, and time limitations as barriers to providing BI and referral to treatment.

Despite a lack of difference in the types of self-reported barriers between community and academic practitioners,

**TABLE 5.** Learning Needs for Prenatal Alcohol Use and Cigarette Smoking

Topic	CTH (n = 39)	AHSC (n = 50)	Total (N = 89)	P
Screening and early identification of alcohol/tobacco use	14 (35.9%)	13 (26.0%)	27 (30.3%)	0.532
Medical complications of alcohol/tobacco use	18 (46.2%)	17 (34.0%)	35 (39.3%)	0.367
Social and psychiatric problems faced by pregnant alcohol/tobacco users	19 (48.7%)	19 (38.0%)	38 (42.7%)	0.467
Treatment options for pregnant alcohol/tobacco users	28 (71.8%)	31 (62.0%)	59 (66.3%)	0.535
Diagnosing and treating alcohol/tobacco withdrawal	18 (46.2%)	20 (40.0%)	38 (42.7%)	0.707
Smoking cessation during pregnancy	24 (61.5%)	25 (50.0%)	49 (55.1%)	0.554
Counselling strategies to increase patients' motivation to reduce or quit alcohol or tobacco use	25 (64.1%)	28 (56.0%)	53 (59.6%)	0.854

Data presented as n (%).

AHSC, Academic Health Sciences Center; CTH, Community-based Teaching Hospital.

these findings indicate that academic care centers may be more challenged in providing an adequate response to pregnant women at risk. Community providers may be more familiar with local resources and, therefore, more likely to refer pregnant women to these programs. The community hospital in this study does have an addiction medicine service which may increase awareness about addiction resources for providers associated with this setting. It is also possible that community-based providers may have more long-term opportunities to assist pregnant women and, therefore, are more likely to offer interventions during pregnancy. In contrast, the academic hospital provides care to pregnant women from a wider catchment area, and therefore, care providers may not be familiar with local resources in various communities and/or provincial programs. Also, due to the more complex nature of pregnant women seen at a tertiary care center, there may be less continuity of care, and therefore, pregnant women may receive less advice and assistance with connecting to appropriate programs for prenatal alcohol use and cigarette smoking.

These differences in practice may also have a significant impact on future providers. Because academic maternity care providers were more likely to be practising in a teaching unit, it is critical that students at all levels of training receive appropriate education to increase knowledge about all aspects of SBIRT. Even though more community providers intervened with pregnant women, there were no differences in learning needs among practitioners at the 2 sites. Increasing knowledge about treatment options for pregnant persons who use alcohol and smoke, and also smoking cessation during pregnancy were indicated by 66% and 55%, respectively, of respondents, indicating a great interest in improving knowledge on management of antenatal alcohol use and cigarette smoking. Based on healthcare professionals' self-reported interest in continuing education, key messages need to be incorporated into training of all maternity care providers. In keeping with Canadian guidelines, maternity care providers should advise abstinence from both alcohol and smoking during pregnancy due to possible adverse effects. If women are not able to abstain, then harm-reduction strategies can be considered. Educational messages need to be clarified to emphasize the safest choice in pregnancy is abstinence due to a lack of safe limits and a continuum of harm with higher levels of use.

System-level initiatives are required to enhance knowledge translation and to help adopt guidelines into practice.

Clinical pathways are also needed to guide providers with evidence-based responses to screening questions and to help them connect women to local resources, if required. These pathways should consist of flow charts from screening to BI and referral to treatment including a list of pregnancy-specific programming and online educational resources for both providers and women.

### Strengths and Limitations

This survey has several strengths. Because we had a high response rate to our survey, these findings represent the majority of maternity care providers across the 3 disciplines of obstetrics and gynecology, family medicine, and midwifery. This means that these results capture the variety of SBIRT practices across the spectrum of provider types. Furthermore, healthcare professionals from both academic and community settings were included in our sample populations providing a perspective across settings. However, there may be a self-report bias meaning that providers may over-report their current screening practices and interventions. Therefore, the rates of various components may be lower than calculated. The questionnaire was also limited to alcohol and cigarette smoking because these are the most commonly used substances during pregnancy; however, with the increased prevalence of cannabis and opioid use by pregnant women, future surveys could incorporate these substances for comparison. It is likely that SBIRT with respect to these other substances may indicate different practice patterns. Future studies should address optimal educational initiatives to enhance the uptake of interventions for all maternity care providers from training to practice.

### CONCLUSIONS

Prenatal alcohol and cigarette smoking are modifiable risk factors for adverse pregnancy outcomes. Because pregnancy is viewed as a window of opportunity to intervene to make a behavior change, maternity care providers have a responsibility to provide assistance to these women. SBIRT represents a validated approach to identifying and modifying these risky behaviors from preconception to postpartum. Despite high rates of screening, BIs and referral to treatment have not been routinely incorporated into clinical practice. Systemic interventions such as enhanced continuing educational tools and development of clinical flow charts may facilitate improved screening and management of alcohol and cigarette smoking during pregnancy.

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