

Vol. 5, No. 2 2011

Preventing Prenatal Alcohol Exposure



Overview

Alcohol and pregnancy:
Avoiding the mix



Review

Helping women help their babies



Next Issue

Helping children overcome trauma

Many children experience traumatic events, including being exposed to abuse, neglect and violence in their homes and communities. In the Summer 2011 issue, we examine what can be done to help these children.



Feature

Addressing social problems
to reduce the use of alcohol



Letters

Reducing bias with good design

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As an interdisciplinary research group in the [Faculty of Health Sciences](#) at [Simon Fraser University](#), we aim to connect research and policy to improve children's social and emotional well-being, or *children's mental health*. We advocate the following public health strategy for children's mental health: addressing the determinants of health; preventing disorders in children at risk; promoting effective treatments for children with disorders; and monitoring outcomes for all children. To learn more about our work, please see www.childhealthpolicy.sfu.ca



**Children's
Health Policy
Centre**

VOL. 5, NO. 2 2011

About the Quarterly

In the *Quarterly*, we present summaries of the best available research evidence on children's mental health interventions, using systematic review methods adapted from the *Cochrane Collaboration*.

Quarterly Team

Scientific Writer

Christine Schwartz, PhD, RPsych

Scientific Editor

Charlotte Waddell, MSc, MD, CCFP, FRCPC

Research Coordinator

Jen Barican, BA

Research Assistants

Orion Garland, BA
& Larry Nightingale, LibTech

Production Editor

Daphne Gray-Grant, BA (Hon)

Copy Editor

Naomi Pauls, BA, MPub

Contact Us

We hope you enjoy this issue. We welcome your letters and suggestions for future topics. Please email them to chpc_quarterly@sfu.ca or write to the Children's Health Policy Centre, Attn: Daphne Gray-Grant, Faculty of Health Sciences, Simon Fraser University, Room 2435, 515 West Hastings St., Vancouver, British Columbia V6B 5K3 Telephone (778) 782-7772



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How to Cite the Quarterly

We encourage you to share the *Quarterly* with others and we welcome its use as a reference (for example, in preparing educational materials for parents or community groups). Please cite this issue as follows:

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Overview

Alcohol and pregnancy: Avoiding the mix

And the first time you are pregnant you do get a pregnancy book which goes into diet ... but I don't think there is enough said about why you shouldn't drink.

I go for the safety aspect. So, because I'm not 100% sure, I just completely abstain to be on the safe side.

I've got to think of my child; I've got to put them first.

— Pregnant women giving their views on drinking¹

Parents want to do all they can to give their children the best possible start in life. To help accomplish this, most women refrain from drinking alcohol during pregnancy. In fact, as Table 1 shows, two recent Canadian surveys found that over 80% of women abstain once they learn they are pregnant.^{2, 3}

Still, many women unintentionally expose their children to alcohol prenatally. As highlighted in the two surveys, women commonly consume alcohol in their first trimester *before* knowing they are pregnant. Women who are not planning on becoming pregnant are especially at risk during this time.² It is particularly concerning that the highest rates of unplanned pregnancies occur among 15- to 19-year-olds, who are also at highest risk for binge drinking.⁴ (See our [previous issue](#) for information on effective treatments for adolescent substance abuse.)



Intervening to reduce adversities and address mental health issues — prior to pregnancy — is likely the best route to improving women's circumstances and their children's subsequent development.

Table 1: Alcohol use among pregnant Canadians

Survey participants	Proportion abstaining	
	Before knowing of pregnancy	After knowing of pregnancy
Representative sample of over 1,000 urban Albertan women aged 18 years and older ²	50%	82%
Representative sample of over 6,000 Canadian girls and women aged 15 years and older ³	38%	89%

Women who do consume alcohol after becoming aware of their pregnancy typically do so infrequently and in small amounts. As reported in Table 1, for the 18% of Albertan women who did drink alcohol after learning they were pregnant, consumption averaged less than half a drink per week and none reported binge drinking.² Similarly, the Canadian survey data suggested that for the 11% of Canadian girls and women who did report drinking after learning they were pregnant, the vast majority did so less than three times per month.³

Who is the most vulnerable?

Who is more likely to drink during pregnancy? Knowing something about the risk factors can be helpful in guiding the development of policies and practices to help women reduce their drinking. Table 2 shows a number of the risks revealed in recent well-designed studies. On balance, these studies

suggest that women experiencing significant adversities, such as poverty and lack of social supports, are at greater risk, as are those with mental health problems, such as substance abuse and depression. These findings suggest that intervening to reduce adversities and address mental health issues — prior to pregnancy — is likely the best route to improving women’s circumstances and their children’s subsequent development.

Table 2: Risk factors for increased alcohol use in pregnancy

Demographics		Beliefs, behaviours and experiences	
Age	Younger ^{6,7} or older (e.g., over 30) ^{2,8,9}	Beliefs and behaviours related to substance use	Viewing drinking during pregnancy as acceptable ^{7,10} Believing that one can “hold more than 4 drinks” ^{7,10} Having past drinking-related memory problems ^{9,10} Having participated in substance abuse treatment ⁷ Using tobacco ^{2,6,7,9} Using illegal drugs (current ⁷ or past ¹⁰)
“Race”	Caucasian ^{2,6,8}		
Education	High school not completed ⁸		
Reproductive history	Fewer children than other women ^{6,7} Fewer pregnancies than other women ⁹		
Poverty and lack of social supports	Receiving welfare ⁸ Single ^{7,9} /Not living with child’s father ⁸ Not attending religious services ⁸	Experiences of adversity	Recent victim of sexual ⁷ or physical abuse ^{7,10} Depression symptoms ^{6,7,9} Unplanned pregnancy ⁸ Partner using alcohol ¹⁰ /other substances ⁷ Living with alcohol or other-substance users ⁷

How does alcohol affect prenatal development?

It is well recognized that alcohol impairs fetal development. The neuro-behavioural effects can even surpass those of marijuana, heroin and cocaine.⁷ The specific outcomes for any given child, however, vary depending on the timing, frequency and amount of alcohol exposure during pregnancy.³ Other factors — such as maternal age, health, nutritional status and social circumstances — also influence children’s outcomes.^{3,11}

During pregnancy, both binge drinking (more than five standard drinks per occasion) and moderate to heavy drinking (seven or more standard drinks per week) put children at risk for lifelong developmental disabilities.¹¹ One particularly noteworthy study tracked 500 children over 25 years and found that those most heavily exposed to alcohol suffered numerous physical, cognitive and emotional problems throughout their development, as outlined in Table 3.¹²

It is widely accepted that women who consume large amounts of alcohol during pregnancy put their children at risk. However, researchers are still debating the precise effects of low-level consumption. Some studies have uncovered harmful effects when women consumed as little as *one drink per week* during the first trimester. For example, a large British study that tracked more than 14,000 children found significantly more mental health problems in children exposed to this low level of alcohol prenatally, including behavioural and emotional difficulties at ages four and seven.¹³

However, other studies have found inconsistent or no effects from such low-level consumption. Such discrepancies led the authors of a recent

“ Because there is insufficient evidence to establish a safe threshold for drinking during pregnancy, abstinence is the healthiest choice. ”

Table 3: Outcomes associated with heavy prenatal alcohol exposure¹²

Age	Identified problems
Newborns	Weaker vital signs, lower heart rates & greater need for breathing assistance
Children	Problems with attention, arithmetic, spatial-visual memory, speed of information processing & overall cognitive functioning
Adolescents	Difficulties with reasoning, following directions, persisting with tasks & using alcohol
Young adults	Higher rates of mental disorders


systematic review to conclude there was no convincing evidence that low levels of prenatal alcohol exposure were associated with adverse effects.¹⁴ Nevertheless, because of weaknesses in many of the 46 studies included in this review, the authors concluded that low levels of drinking during pregnancy still could *not* be deemed safe.

Inconsistencies also exist across the numerous official guidelines for alcohol use during pregnancy. When researchers reviewed guidelines from seven English-speaking countries — including Canada — they found recommendations ranged from endorsing abstinence to advising that the risk from small amounts of alcohol is minimal.¹⁵ The review also found that only one organization, the Royal College of Obstetricians and Gynaecologists in the United Kingdom, used systematic research reviews as the basis for their recommendations.¹⁵ The current recommendations from Health Canada state: “There is NO safe amount or safe time to consume alcohol while you are pregnant.”¹⁶

Making the healthiest choices possible

Because there is insufficient evidence to establish a safe threshold for drinking during pregnancy, abstinence is the healthiest choice.⁴ Helping women achieve this goal often begins with a simple conversation. In Canada, all prenatal care providers are required to use standardized record forms that include at least one question on alcohol consumption and predictors of alcohol use.¹⁷ A recent survey found that 94% of Canadian health care providers do routinely discuss alcohol use with pregnant woman.⁴

When women acknowledge using alcohol during pregnancy, practitioners have an opportunity to talk about options. These may include specialized treatment services for the small number who abuse alcohol or who are dependent on it.⁴ Such services have the potential to substantially reduce negative child outcomes, including a fetal alcohol spectrum disorder.¹⁷

Other less intensive interventions may be appropriate for women who consume alcohol at lower levels. Among the most common are “brief interventions” that teach women strategies for reducing or eliminating alcohol use, often within a single session.⁴ In the Review article that follows, we summarize the outcomes from evaluations of four such brief interventions. 

Volunteering to prevent teen pregnancy

Given that the risks of drinking during pregnancy are much higher for teens, one approach to preventing fetal alcohol effects involves preventing teen pregnancy. The *Teen Outreach Program* took a novel approach to doing this by engaging youth in volunteer community service. To evaluate the effectiveness of this strategy, researchers recruited 695 students from 25 different American high schools to participate in a randomized controlled trial.⁵ Students assigned to the *Teen Outreach Program* intervention averaged 46 hours of volunteer service, ranging from tutoring peers to assisting in nursing homes. They also participated in weekly classroom discussions focused on maximizing their learning from volunteer experiences and helping them cope with life issues such as family stresses.

By the end of one school year, girls in the *Teen Outreach Program* were 50% less likely to become pregnant compared to girls in the control group. As well, both girls and boys in the *Teen Outreach Program* were 50% less likely to fail a course or be suspended compared to controls. (Both findings were also statistically significant.) These findings suggest that a fairly brief intervention, over just one school year, can have a powerful impact on outcomes such as teen pregnancy, while benefiting the community and potentially teaching teens additional valuable life lessons about community participation.

Helping women help their babies

To identify effective ways to reduce alcohol consumption in pregnancy, we conducted a systematic review using methods adapted from the *Cochrane Collaboration* (described in the [Appendix](#)). We accepted four randomized controlled trials (RCTs), detailed in six different articles, from a total of 10 articles retrieved for initial assessment.

All the interventions involved primary prevention programs aimed at reducing alcohol use in pregnant American women. Two studies included women who acknowledged consuming at least one drink of alcohol while pregnant.^{18, 19} The other two included women who drank alcohol in the six months before the study²⁰ or women who were “at risk” for alcohol use during pregnancy.²¹ None of the studies included women whose alcohol consumption reached levels that might constitute abuse or dependence.^{20, 21}

All interventions were very brief, consisting of a single 10- to 60-minute session.^{18, 19} While all interventions took place in the prenatal care clinics where women were recruited, the main component of one involved a self-help manual that participants completed independently at home.¹⁹ Two interventions — *Brief Intervention* and *Brief Intervention with Partners* — were primarily delivered to older, socio-economically advantaged women. In contrast, the other two interventions — *Brief Education and Self-Help Manual* and *Motivational Interview* — were primarily delivered to younger, socio-economically disadvantaged women. The participants and the interventions are further described in Table 4.



Three of the interventions — *Brief Intervention*, *Brief Intervention with Partners* and *Motivational Interview* — led to positive outcomes regarding alcohol use.

Table 4: Description of participants and interventions

Participants	Interventions (number of participants)	Control (number of participants)
Average age		
SES		
31 years Advantaged	Brief Intervention: ²⁰ Psychiatrist-delivered 45-minute session including: establishing alcohol use goals; recognizing drinking triggers; identifying alternatives to drinking; & providing take-home manual on preventing alcohol-related problems (123)	Comprehensive alcohol use assessment (127)
31 years Advantaged	Brief Intervention with Partners*: ²¹ Psychiatrist- or nurse-practitioner-delivered 25-minute session including: establishing alcohol use goals; recognizing drinking triggers; identifying alternatives to drinking; identifying how partner can provide support; & providing written summary of intervention (152)	Comprehensive alcohol use assessment (152)
22 years Disadvantaged	Brief Education and Self-Help Manual: ¹⁹ Health-educator-delivered 10-minute session describing alcohol effects on fetus; self-help manual then completed at home, including describing fetal alcohol syndrome, tracking alcohol use, increasing motivation/confidence to end use, & learning skills to avoid alcohol (42)	Usual prenatal care (36)
24 years Disadvantaged	Motivational Interview: ¹⁸ Psychologist-delivered 60-minute session including: describing alcohol's effects on fetal developmental; providing feedback on alcohol use; & encouraging confidence to end use (20)	Letter noting alcohol use risks (22)

SES Socio-economic status

* While most partners were spouses, women could choose any supportive adult knowledgeable about their health habits.

Do brief interventions work?

Three of the interventions — *Brief Intervention*, *Brief Intervention with Partners* and *Motivational Interview* — led to positive outcomes regarding alcohol use. Importantly, the positive outcomes were only achieved by very specific subgroups of women (as displayed in Table 5).

Table 5: Beneficial outcomes for subgroups of intervention participants

Intervention	Subgroups that made gains	Beneficial outcomes* and their duration
<i>Brief Intervention</i> ²⁰	Women who were abstinent before the intervention	More likely to remain abstinent throughout the pregnancy
<i>Brief Intervention with Partners</i> ²¹	Women who drank more before the intervention	Reduced frequency of alcohol consumption throughout the pregnancy
<i>Brief Education and Self-Help Manual</i> ¹⁹	None	None
<i>Motivational Interview</i> ¹⁸	Women with the highest intoxication levels before the intervention	Had lower peak blood alcohol concentration levels two months after the intervention

* Defined as outcomes that were statistically significant at $p < .05$.

Specifically, *Brief Intervention* was effective only among women who had committed to being abstinent during pregnancy. These women were significantly more likely to remain abstinent throughout the pregnancy if they received the intervention rather than being in the control group (86% versus 72%, respectively).²⁰

In the other two interventions, beneficial outcomes were only achieved among the participants who had higher levels of alcohol use before enrolling in the studies. Specifically, in *Brief Intervention with Partners*, women who drank more at study enrolment were significantly more likely to reduce their frequency of drinking if they received the intervention rather than being in the control group.²¹ For example, if a participant drank five days per month before the study, she would reduce her drinking to one day per month if she received the intervention, compared to one and a half days per month if she was in the control group.

Similarly, in *Motivational Interview*, women with the highest pre-intervention intoxication levels made the greatest gains. In this study, the significant outcome measure was peak blood alcohol concentration (BAC). (BAC identifies the amount of alcohol absorbed by the body and is commonly reported as milligrams of alcohol per decilitre of blood.) Participants with higher initial BACs (greater than one standard deviation above the mean) had the greatest reductions in BACs at follow-up if they received the intervention rather than being in the control group.¹⁸

“ Many women will stop using alcohol during their pregnancy without any intervention. ”

While none of the interventions were successful for the intervention group as a whole (see Table 6), the *Brief Education and Self-Help Manual* was the only intervention that failed to produce benefits for even a subgroup of participants. Difficulties in completing the manual may have been part of the problem, as participants finished only five of the nine sections on average.¹⁹ These findings suggest that young, economically disadvantaged women likely require considerably more support than a self-help manual to reduce their alcohol use during pregnancy.

Table 6: Non-significant outcomes for full sample of intervention participants

Intervention	Non-significant outcomes	
Brief Intervention ²⁰	• Drinks per drinking day	• Number of drinking episodes
Brief Intervention with Partners ²¹	• Drinks per drinking day	• Number of drinking days
Brief Education and Self-Help Manual ¹⁹	• Alcohol abstinence • Intention to abstain in coming month	• Alcohol consumption in past month • Knowledge about alcohol effects
Motivational Interview ¹⁸	• Total alcohol consumption	• Number of abstinence days

Although the main concern with women drinking during pregnancy is the effect on the developing fetus, only one study assessed infant outcomes. The *Brief Intervention* — delivered in a low-risk sample — was found to have no effect on infant birth weights or Apgar scores.²⁰

What happens without intervention?

Interestingly, in three of the studies, more than half of the women refrained from using alcohol *regardless of whether they were in the intervention or the control group*, as displayed in Table 7. These results suggest that many women will stop using alcohol during their pregnancy without any intervention.

Table 7: Intervention and control participants reporting alcohol use*

Study	Before study enrolment	From enrolment to final assessment
Brief Intervention ²⁰	43%	34%
Brief Intervention with Partners ^{21,22}	> 80%	46%**
Brief Education and Self-Help Manual ¹⁹	100%	21%
Motivational Interview ¹⁸	100%	62%

* No studies assessed whether alcohol use reductions among both intervention and control participants were statistically significant.

** Reported rate is for intervention women only as percentage of drinkers in the control group was not reported.

As well, two studies that measured rates of ongoing alcohol consumption found that women used alcohol very rarely — ranging from less than once a month²¹ to less than once in six months.²⁰ These women also reported drinking less than one drink on the occasions when they did drink.^{20, 21}

Supporting women to drink less

The studies covered in this review suggested that most women stop drinking during pregnancy. In three of the RCTs, more than half of women were abstaining by the end of the study, whether or not they received the intervention. Additionally, in one RCT, 57% of women were abstaining even *before* beginning the study. These data suggest that most women understand the importance of refraining from drinking during pregnancy and make the choice to do so.

The results from the four RCTs also suggest that time-limited interventions may help some women reduce their drinking during pregnancy. *Brief Intervention with Partners* and *Motivational Interview* were *only* effective for women with higher levels of alcohol consumption. This suggests that women at highest risk may gain the most from preventive interventions.

A variety of strategies is likely needed to make as many pregnancies as possible free from alcohol. The specific type and intensity of interventions likely needs to vary, based on a given woman's level of alcohol use and her general level of need. For those women at highest risk, who are abusing alcohol or facing other significant adversities in their lives, more intensive services are required. For women drinking at low or moderate levels during pregnancy, participating in short-term interventions may well be beneficial. Finally, for those women at lowest risk, not drinking or only drinking at low levels before becoming pregnant, interventions may not be needed because many will stop drinking on their own. If services can be targeted appropriately, based on the needs of the individual woman, then outcomes for children are likely to be better. 🖐️

“ Most women understand the importance of refraining from drinking during pregnancy and make the choice to do so. ”

Addressing social problems to reduce the use of alcohol

Vancouver's Downtown Eastside is a magnet for people in British Columbia who struggle with alcohol or substance use issues. Noted for a high incidence of poverty, for its illicit sex trade and for crime, the area still draws a number of women who are either pregnant or parenting young children.

In response to a growing understanding of the needs of these women, government and community representatives worked together to create Sheway in 1993. Located in the heart of the Downtown Eastside, at 533 East Hastings, the organization offers comprehensive health and social services to women — and their children — in need.

Amy Salmon is Sheway's current coordinator. A clinical assistant professor at the UBC School of Population and Public Health, she is also the former managing director of the [Canada Northwest Fetal Alcohol Spectrum Disorder Research Network](http://www.canfasd.ca/) (www.canfasd.ca/). She operates on the principle that women's and children's health is inexorably linked to the conditions in which they live. Furthermore, she is well aware that mothers in difficult circumstances may have little ability to *influence* these conditions.

"We should be concerned by the way that shame and blame so often become barriers to care," she says. "It's important that women get the message about not drinking alcohol while pregnant, but we also need to provide the *supports* that make staying away from alcohol both feasible and safe."

The Sheway program consists of prenatal, postnatal and infant health care as well as education and counselling about nutrition, child development, addictions, HIV and hepatitis C, housing and parenting. Sheway also helps in fulfilling basic needs, such as providing daily nutritious lunches, food coupons, food bags, nutritional supplements, infant formula and clothing.

Salmon says that mothers of children affected by fetal alcohol spectrum disorders are most often women who have been marginalized in a number of ways. She argues passionately that increasing information about the risks of alcohol is not nearly enough to make a change. "I have *never* met a woman who didn't understand that she shouldn't drink while pregnant," she says. "And I have *never* met a woman who intended to harm her baby,"



■ "It's important that women get the message about not drinking alcohol while pregnant, but we also need to provide the *supports* that make staying away from alcohol both feasible and safe."

— Amy Salmon, coordinator of Sheway

“Women's and children's health is inexorably linked to the conditions in which they live.”

she adds. “It isn’t about the information — it’s more about the conditions they’re living in and whether acting on the information is even possible.”

The heart of the problem, according to Salmon, is that women who have been marginalized have so few choices. She cites studies led by University of Washington researcher Susan Astley in 2000 aimed at generating a comprehensive, lifetime profile of the women who gave birth to one or more children with confirmed prenatal exposure to alcohol.^{23, 24} Of the mothers studied, she said, the majority had not completed high school. Furthermore, almost all had been physically or sexually abused during their lifetime, and almost all had a mental disorder of one kind or another, in addition to having problems with substances.

“When we look at this study and consider the risks, we need to think about the issue of prevention,” Salmon says. “It’s a women’s issue. Lots of research has looked at a variety of ways in which improving women’s overall health and improving the choices available to women will help with prevention.”

Salmon also cautions that health care professionals need to be careful and respectful with the language they use. “Doctors often ask questions in ways that can be blaming or shaming,” she says, describing how the comment “You don’t drink, do you?” made during a prenatal visit could shut down a woman’s likelihood of responding honestly.

As well, she is concerned that increased public awareness of the risks of drinking while pregnant may cause some women to avoid disclosing problems with substance use out of fear that they will be judged harshly and that their children may be removed from their care. “Fear of losing custody of their children is the number one barrier to women seeking treatment.” Salmon says. 🖐️

“Improving women’s overall health and improving the choices available to women will help with prevention.”

Reducing bias with good design

To the Editors:

In your previous issue of the *Quarterly*, you presented outcomes from the various Nurse-Family Partnership (NFP) evaluations. Doesn't it concern you that the developers of this intervention were involved in all three evaluations? Wouldn't this lead to worries about bias?

Trisha Myers
Victoria, BC



In all three featured NFP evaluations, the researchers used a study design that greatly minimizes the potential for bias — the randomized controlled trial (RCT). In RCTs, participants are randomly assigned to either intervention or control groups, with researchers having no influence over which condition participants receive. This means that in the NFP trials, researchers could not influence outcomes by assigning women they believed to be particularly likely to benefit from NFP to the intervention group.

The RCT design also increases the likelihood that individuals in the intervention and control groups share similar characteristics, to ensure that groups are readily comparable.²⁵ In the NFP trials, women in the control and intervention groups were stratified, or balanced, according to several factors: age,^{26, 27} ethnic status,^{26–28} employment status,²⁶ marital status,²⁸ and region of residence.^{26–28} Doing so gave researchers assurance that any positive NFP outcomes were actually due to NFP, rather than to women in the intervention and control groups being different in some fundamental way.

Beyond these measures, NFP researchers further reduced the likelihood of bias by ensuring that the individuals collecting the outcome data were themselves “blinded” as to whether participants were in the intervention or the control groups.^{26, 29, 30} This procedure further reduced the possibility of researchers influencing outcomes.²⁵

Finally, a form of bias can occur if researchers have a vested interest in their interventions, for example, if there are potential financial gains for the researcher. In the United States and elsewhere, the NFP National Service Office is a non-profit organization,³¹ precluding income being made from the program. Also, the founder of the program, David Olds, has no personal financial interest in NFP.³⁰ 🙅

In RCTs, participants are randomly assigned to either intervention or control groups, with researchers having no influence over which condition participants receive.

We welcome your questions

If you have a question relating to children's mental health, please email it to chpc_quarterly@sfu.ca or write to the Children's Health Policy Centre, Attn: Daphne Gray-Grant, Faculty of Health Sciences, Simon Fraser University, Room 2435, 515 West Hastings St., Vancouver, BC V6B 5K3.

Research methods

For our review, we used systematic methods adapted from the *Cochrane Collaboration*.³² We restricted our search to randomized controlled trials published in peer-reviewed scientific journals, without limiting by publication date.

To identify high-quality intervention evaluations, we first applied the following search strategy:

Sources	<ul style="list-style-type: none"> • Medline, PsycINFO, CINAHL, ERIC and the Cochrane Database of Systematic Reviews
Search Terms	<ul style="list-style-type: none"> • Prenatal alcohol exposure or pregnancy and alcohol drinking, alcohol abuse and prevention, treatment or intervention
Limits	<ul style="list-style-type: none"> • English-language journal articles

Next, we applied the following criteria to ensure we included only the highest-quality pertinent studies:

- Clear descriptions of participant characteristics, settings and interventions
- Intervention focused on reducing pregnant women's alcohol consumption
- Random assignment of participants to intervention and control groups at study outset
- Follow-up of two months or more (with birth of the child being the final possible follow-up date)
- Maximum attrition rates of 20% at follow-up *or* use of intention-to-treat analysis
- Outcome measures included women's alcohol use during pregnancy
- Levels of statistical significance reported for all primary outcome measures

Two different team members assessed each retrieved article to ensure accuracy of interpretations. Any differences were discussed until consensus was reached. Data were then extracted and summarized by the team. 🖐️

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BC government staff can access original articles from [BC's Health and Human Services Library](http://www.health.gov.bc.ca/library/) (www.health.gov.bc.ca/library/).

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